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Calligraphy Style Layer Representation and Classification

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Abstract: The acquisition of writing skills is obtained by observing and copying examples with specified styles currently, these style-specified works are retrieval by its labeled metadata, instead of by the content of the image. This is because calligraphic artist describes calligraphy style emotionally, and can't translate into computer language directly. Therefore, this paper proposes a computational way for calligraphy style representation: Firstly, hierarchical features are extracted from works, individual characters and composed strokes to build calligraphy style model and to classify different styles. The style classification of 1000 single-word images and 1200-page images is carried out respectively. Compared with various style classification algorithms, the classification effect has obvious advantages. The computational calligraphy style representation and classification method can help learners observe and know calligraphy works better. It can also help to discover latent calligraphy group. **Keywords:** Calligraphic style; Feature extraction; Style recognition; Neural network; Standard font classification.

1. INTRODUCTION

Although the popularity of electronic equipment has reduced the chance of handwritten characters in daily life and production, the writing skills of characters are still taught in primary and secondary schools all over the world. Different nationalities and schools have different styles of handwritten characters. The current screen can not only display printed characters, but also display characters of different fonts, even calligraphy characters of different styles. However, there is still a lack of quantitative expression of the specific features and internal relations between these different styles of writing. The description of writing style is still subjective and lacks objective description. When learning writing skills, learners usually observe and copy the selected Calligrapher's works continuously. If the time of writing observation is long, it will produce the feeling of "seeing the characters as the face", that is, they can identify the works of the designated calligraphers. This is because calligraphers of the same school have similar brush writing habits, knot body embodiment and layout habits. This paper simulates the psychological process of human learning and appreciating calligraphy, and expresses and classifies calligraphy styles. In the field of image, the research on font style is increasing in recent years, but most of them focus on hard pen handwriting. Although the research objects of hard pen handwriting and soft pen handwriting are different, there are many similarities. A personalized handwritten font

generation system -- scfont [1] is proposed by Lian Zhouhui research group. Users only need to input a small number of handwritten characters to systematically learn their own handwriting style and generate a large number of personalized handwritten font databases.

The differences of individual styles are mainly reflected in the change of stroke style, stroke layout, stroke width and the connectivity of two consecutive strokes. On the basis of the personalized handwritten font database, scfont system generates personalized style works. In the generated works, the same characters in different places use the same character model in the font library, and the same strokes in different characters use the same stroke model. This does not work in calligraphy works, because even if it is written by the same person, calligraphy should not be identical and pursue change. The images of each character in calligraphy works are different. For example, there are 20 'Zhi' in the 324-character preface to 'Lanting', with different writing methods and each of them is different. In other words, the style of calligraphy is not only reflected in the characteristics of strokes, but also in the composition and the whole character. But the expression of hard pen handwriting style can be used for reference in this system. In terms of soft brush calligraphy style, Zhuang Yueting's research group proposed the late style model to explore the writing style of calligraphy works [2]. They use the 32 dimensional character texture features extracted by Gabor filter to define writing style, express the extracted calligraphy style as a polynomial probability distribution of visual words, and then use polynomial fitting approximation function to construct potential style model; finally, calculate the contribution value of visual words to the expression of calligraphy style, and complete the classification of calligraphy style with the help of style similarity of visual words. Zhang Yi et al. Extracted three types of features: location feature, region feature and projection feature to establish global feature descriptor for calligraphy style recognition [3]. The position feature focuses on the balance of the whole character, the proportion feature highlights the relationship between the stroke distribution and stroke, and the projection feature represents the balance between the horizontal direction and the vertical direction. These three types of features take into account the similarities within the same type of fonts and the differences between different types of fonts, but they are all overall features, and stroke features are not considered. Zhang Fucheng et al. Proposed an algorithm based on convolutional neural network, which integrates the two processes of feature extraction and classification

recognition to automatically extract style features and classify them [4]. The model can identify four types of regular script style calligraphers (Yan Zhenqing, Liu Gongquan, Ouyang Xun, Zhao Mengfu) and achieve good classification results. Although the characters are different, there are still some similarities in the research of font style at home and abroad. For the study of Latin, tutorialba uses handwriting features and calligraphy features to identify handwriting, and introduces five single character level features and seven letter level features to represent the writing style of characters [5]. Among them, the letter distance and the change of letter size in a word are single character level features, which are similar to those of the style of calligraphy. In the field of English, srihari establishes a model to study handwriting. It combines global features and local features to determine whether the two types of handwriting are written by one person. In the above studies, researchers only select a certain aspect in the style expression, and do not comprehensively combine the overall characteristics and local features for style

representation.

In this paper, a novel classification method of calligraphy style features is proposed, which represents the calligraphy style from the three levels of composition, whole character and stroke. From the calligraphy page image to obtain the composition features, from the single character image to extract the structure feature, from the single character image to extract the stroke feature, construct the style model, and classify the calligraphy style.

2. SYSTEM ARCHITECTURE

The framework of calligraphy style expression and classification proposed in this paper is shown in Fig. 1.

1) Expression of style features: extract the stroke, knot and structure of the data source image, construct the model, and train to get the regular script style classification model.

2) Style Classification: according to the calligraphy image input by users, the features of stroke, knot and structure are also extracted, and the classification results are fed back to users by using the calligraphy style classification model.

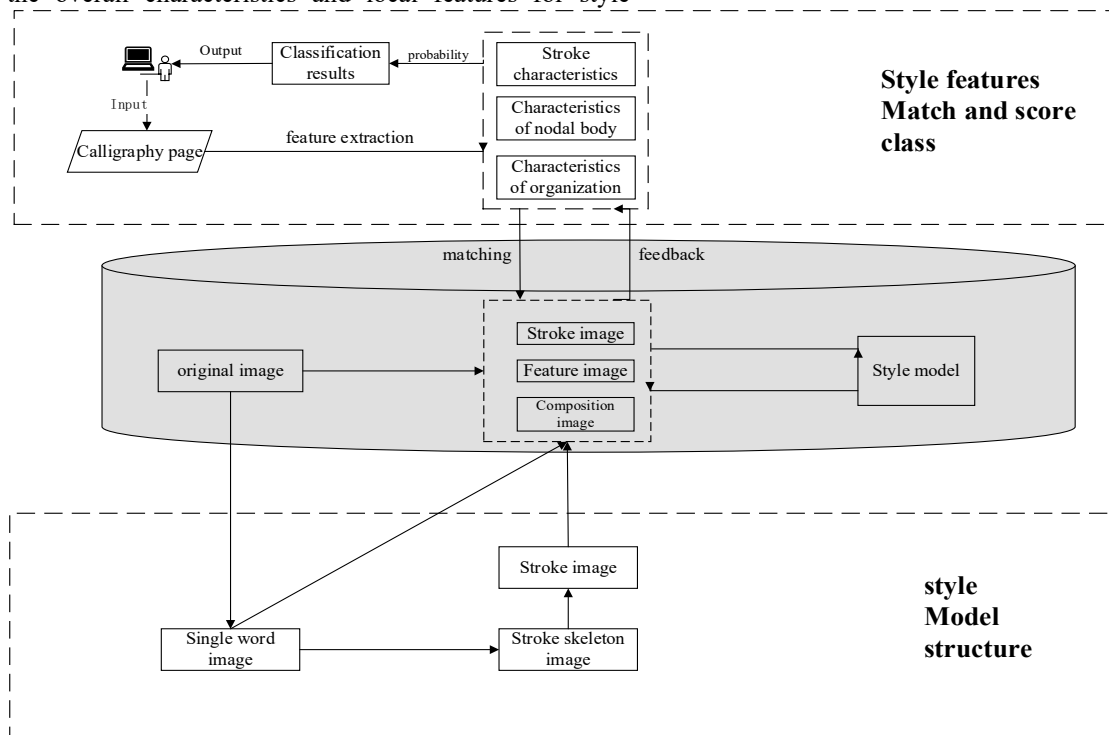


Fig. 1 calligraphy style expression and classification framework

3. EXPRESSION OF CALLIGRAPHY STYLE

In this paper, we use the layered method to express it from the stroke level, the knot level and the composition level. The style of Stroke layer mainly refers to the change of strokes when writing, the style of knot layer mainly refers to the characteristics of calligraphy on single characters, and the style of composition layer refers to the layout of characters in the page.

3.1 STROKE LAYER STYLE

The main character of calligraphy is the basic character of calligraphy. The characteristics of stroke level in this paper can be divided into two levels: the first layer is the basic trend of strokes, and the second layer is the ending situation under the basic trend.

3.1.1 STROKE EXTRACTION

Stroke trend is an important style feature. In this paper, the direction chain code is used to express the stroke trend, as shown in Figure 2. P in Figure 2 (b) is the current pixel.

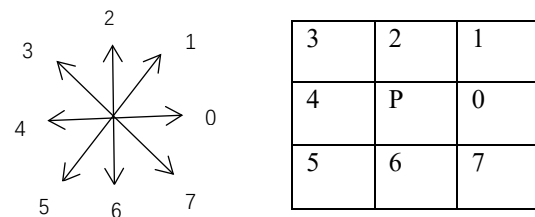


Fig. 2 eight neighborhood directional coding

Stroke is the basic element of a single character and carries the most important style information. First, the calligraphy page image is segmented to get the single character, and

then the stroke is extracted from the single character. The single character image is obtained by segmenting the page image as shown in Fig. 3 (a) by using the word gap, and then the single word image is binarized by Otsu method to obtain the single word as shown in Fig. 3 (b). Then, Zhang Suen thinning algorithm is used to obtain the stroke skeleton as shown in Fig. 3 (c). According to the skeleton (3) and [7], we extract the stroke width based on the skeleton.



Original image (b) single character binary image (c) skeleton image (d) stroke with width

Fig. 3 Sketch of stroke extraction

3.1.2 STROKE STYLE EXPRESSION

From thick to thin, the expression of strokes can be divided into two levels: the first layer is the basic movement trend of strokes, generally speaking, it is any of the horizontal, vertical, skimming and pressing; the second is the way of finishing strokes, such as whether there is a hook at the end of the horizontal strokes to form a "horizontal hook".

One level stroke classification

Suppose that single stroke skeleton chain codes $snake_i = a_1 a_2 \dots a_j$ and $Type(snake)$ are recorded as stroke category calculation formula, and the formula is defined as formula(1):

$$Type(snake_i) = \{\arg \max count\{n\}\} \bmod 4 \quad (1)$$

Where $Type = 0, 2, 1, 3$. The main trends of strokes correspond to horizontal, vertical, skimming and pressing strokes, as shown in Table 1.

Table 1 stroke chain code display

Type	Chain code
transverse	00012000001000123
vertical	222222221222232222222
Skim	111121212151115112111
Restraining	667677676777777777777

Two layer stroke classification

The first layer of strokes is the main stroke, which direction accounts for a high proportion is determined as that direction. In fact, different ending treatments under the same main stroke will present different states. For example, the vertical hook in Figure 3 (c) is determined as vertical according to the definition of formula (2), but it is actually called "vertical hook". Therefore, on the basis of one layer strokes, two layers of strokes are divided according to the ending. In a layer of strokes, the vertical hook and the vertical pen belong to the same category. The difference is that the appearance of the "hook" at the end of the chain

code will affect the proportion of 2 and 6 codes in the direction coding. Similarly, "horizontal hook" also has a similar situation. The horizontal pen purity and vertical pen purity are used to distinguish the horizontal hook and the horizontal pen, and the vertical hook and vertical pen are defined as formula(2):

$$\begin{cases} H_{ratio} = \frac{count[0] + count[4]}{length} \\ V_{ratio} = \frac{count[2] + count[6]}{length} \end{cases} \quad (2)$$

3.1.3 STROKE FEATURE EXPRESSION

The same school of calligraphy, because of long-term copying, has the same writing habits. According to the characteristics of calligraphy writing, the style features are extracted from three levels of strokes, knot style and composition

Pen width change

The change information of stroke width is an important feature of style classification. The minimum bounding area of strokes is used to calculate the width of the M skeleton

point. Taking the current point P_m^{wid} as the center, draw a line every 2° to get 180 pairs of intersection points, and select the combination with the shortest distance is defined as formula(3)

$$d_m = \min |p_{n,1} p_{n,2}|, n = 1, 2, \dots, 180 \quad (3)$$

Slope shift

The slope can show the trend characteristics of strokes. The slope k is defined as the coordinate of the straight line connecting the starting point coordinate (x_s, y_s) and the ending point coordinate (x_e, y_e) is defined as formula(4).

$$k = \frac{y_e - y_s}{x_e - x_s} \quad (4)$$

Relative disturbance degree

The relative disturbance degree of strokes [8] can show the characteristics of starting and receiving strokes, which is a stroke morphological feature. The relative disturbance degree is defined as the area formed by the line connected with the skeleton stroke starting point.

The calculation of the disturbance area is equivalent to calculating the number of pixels in the disturbed area area, that is, we can replace the disturbance area by calculating the distance from each point on the skeleton to the straight line. The formula is defined as formula(5):

$$f_{var} = \sum_{i=0}^N \frac{|Ax_i + By_i + C|}{\sqrt{A^2 + B^2}} \quad (5)$$

where $A = y_{ie} - y_{is}$, $B = x_{ie} - x_{is}$, $C = x_{is}y_{ie} - x_{ie}y_{is}$.

N is the number of skeleton points, and (x_i, y_i) is the coordinate of point i . (x_{is}, y_{is}) , (x_{ie}, y_{ie}) is the coordinates of the starting point and the ending point of the skeleton stroke.

Stroke entropy

Different styles of similar strokes have similar shapes, but due to the different writing habits of calligraphers, the twisting degree of strokes is different. In this paper, stroke

entropy is used to characterize the degree of stroke distortion. Through the relative chain code of skeleton strokes, the calculation process is defined as formula(6).

$$\begin{cases} E = -\sum_{i=0}^7 sd[i] \times \log(sd[i]) \\ sd[i] = \frac{\text{count}\{\text{code}[j] == i\}}{\text{length}} \end{cases} \quad (6)$$

Where, length is the length of the skeleton stroke relative to the chain code, and code[j] is the coding value of the j position of the chain code.

The characteristics of horizontal strokes

Each calligrapher has different starting and finishing strokes. For example, the horizontal pen of Yan style tilts 45 ° at the beginning and droops downward when the pen is closed, and the Liuti pen starts vertically, but there is no obvious downward trend.

After extracting the long horizontal strokes, the first 1 / 5 and the last 1 / 5 of the skeleton stroke chain code are selected to calculate the ratio of 2 and 7, is defined as formula(7).

$$H_{\text{type}} = \frac{\text{count}[2] + \text{count}[7]}{\frac{2}{5} \text{length}} \quad (7)$$

Stroke thickness ratio

As typical strokes, horizontal and vertical strokes contain Calligraphers' strong personal writing style. For example, the horizontal and vertical strokes of the face are relatively thick, but the willow style is not obvious. Let m and n be the number of horizontal strokes and vertical strokes respectively. The thickness ratio of horizontal and vertical strokes is defined as formula(8):

$$S = \frac{\frac{1}{m} \sum_{i=1}^m w_{hi}}{\frac{1}{n} \sum_{j=1}^n w_{nj}} \quad (8)$$

3.2 WHOLE WORD LAYER STYLE

The character level feature is knot feature, which is the structural form of font, that is, the stippling arrangement in each character. The same strokes and different knot style calligraphy characters have different styles. For example, the facial style is relatively fat, the European style is thin and long, and the Zhao style is broad and graceful. These descriptions are the characteristics of the calligraphy style. In this paper, from the following characteristics of calligraphy character knot body characteristics are characterized.

3.2.1 KNOT SHAPE

The knot shape is defined as the height width ratio of calligraphy characters and formula(9)

$$R = \frac{h}{w} \quad (9)$$

Among h and w are the height and width of calligraphy characters.

3.2.2 CENTER OF GRAVITY POSITION

The center of gravity of calligraphy is not in the center of the smallest bounding box, as shown in Figure 8. Due to the different writing habits of each calligrapher, the center

of gravity of calligraphy characters deviates in a certain direction, and there is a certain regularity in the deviation. Otherwise, the characters formed by the combination will have a sense of "staggering". Assuming that the image function of calligraphy character is $f(x, y)$, the center of gravity $G = (\bar{x}, \bar{y})$ of calligraphy character is defined as formula(10):

$$\begin{cases} \bar{x} = \frac{m_{10}}{m_{00}}, \bar{y} = \frac{m_{01}}{m_{00}} \\ m_{pq} = \sum_{x=0}^{w-1} \sum_{y=0}^{h-1} x^p y^q f(x, y) \end{cases} \quad (10)$$

Where The center of gravity of $f(x, y) = \begin{cases} 1, & (x, y) \text{ is the former scenic spot} \\ 0, & (x, y) \text{ is the background point} \end{cases}$ becomes

$$G = (\frac{\bar{x}}{w}, \frac{\bar{y}}{h}) \text{ after normalization.}$$

3.2.3 CHANGE OF PEN SPEED

Different Calligraphers' writing habits vary in the speed of moving the brush, which is reflected in the image: the longer the brush stays at a point, the thicker the stroke will be. Therefore, when the brush is moved at a calm and uniform speed, the thickness of the stroke is uniform; when the mood fluctuates, the speed of the uniform speed varies greatly, and the thickness of the stroke changes greatly, and even appears to be white in extreme cases. Let $f_{xstress}$ and $f_{ystress}$ be the variation characteristics of pen pressure on

the x-axis and y-axis, and f_{xangle} and f_{yangle} be the inclination degree of the characters on the x-axis and y-axis to represent the change of the stroke force. To simplify the representation, the second-order center distance is defined as formula(11)\(12).

$$u_{mn} = \sum_{x=0}^{w-1} \sum_{y=0}^{h-1} (x - \bar{x})^m (y - \bar{y})^n f(x, y) \quad (11)$$

$$\begin{cases} f_{xstress} = \frac{u_{30}^+}{u_{30}^+ + u_{30}^-} \\ f_{ystress} = \frac{u_{03}^+}{u_{03}^+ + u_{03}^-} \\ f_{xangle} = \frac{u_{21}^+}{u_{21}^+ + u_{21}^-} \\ f_{yangle} = \frac{u_{12}^+}{u_{12}^+ + u_{12}^-} \end{cases} \quad (12)$$

Among them, u_{30}^+ and u_{30}^- are the ink points respectively, and are divided into two parts with the center of gravity of X axis as the boundary, and the rest are the same.

3.3 COMPOSITON STYLE

Composition refers to the overall layout of the page. The space between words and lines is harmonious, which gives people a stable and solemn visual effect.

3.3.1 PROMOTING QI

In calligraphy, Xingqi is expressed as the momentum between lines in a pair of calligraphy. Focusing on the layout of separated lines, it can be expressed as the swing

degree of calligraphy characters deviated from the center line. Taking the vertical line Qi as an example, taking the abscissa of the center of gravity of the first character as the measurement standard, the starting abscissa of the rest of the calligraphy characters are on the same line with the abscissa of the first character, so the deviation degree of the other calligraphy characters is defined as formula(13):

$$LW = \begin{cases} \sum_{i=1}^H |x_i - X'| \\ \sum_{j=1}^W |y_j - Y'| \end{cases} \quad (13)$$

W and H are the number of horizontal and vertical calligraphy characters on the page image.

3.3.2 WORD SPACING

In terms of layout, the spacing between characters and lines, lines and lines tends to be even, but not equal. Each calligrapher does not deal with the blank space between

Table 2 shows the 30 attribute names and descriptions of the style feature dataset.

ID	Symbol	name	explain
x_1, x_2	E	Stroke entropy	x_1 Is the stroke entropy of the whole page. If there is no such stroke on the whole page, it is set to - 1, and this feature will be omitted during the comparison (the following cases will be treated in the same way). x_2 is corresponding to the pen.
x_3, \dots, x_8	μ_b	Stroke width	x_3, \dots, x_8 Corresponding to the average stroke width of horizontal, vertical, skimming, pressing, horizontal hook and vertical hook respectively.
x_9, \dots, x_{14}	σ_b	variance	x_9, \dots, x_{14} represent the variation variance of stroke width corresponding to horizontal, vertical, left, right, horizontal hook and vertical hook respectively.
x_{15}, x_{16}	f_{var}	Relative disturbance	The relative disturbance of horizontal pen and vertical pen respectively.
x_{17}, x_{18}	K	Slope	It corresponds to the slope of horizontal and vertical strokes respectively.
x_{19}	H_{type}	Horizontal pen type	It indicates the features of the start and end of horizontal strokes.
x_{20}	S	Stroke thickness ratio	Represents the thickness ratio of all strokes on the page.
x_{21}	R	Knot shape	Represents the aspect ratio of the whole word.
x_{22}	G	Center of gravity position	Indicates the offset position of the whole word.
x_{23}, \dots, x_{26}	PE	Changes in the strength of writing	Represents the stroke handling characteristics of the whole word.
x_{27}	μ_{wb}	Stroke width of whole character	Represents the stroke width feature of a whole character.
x_{28}	σ_{wb}	Stroke width variance of whole character	Represents the change information of stroke width of whole character.
x_{29}	LW	Promoting Qi	The degree to which the calligraphy character deviates from the center line.
x_{30}	DW	Word spacing	Close to the distance between two calligraphy characters.

4.1.2 FEATURE ANALYSIS

The results show that the features are independent of each other and conform to normal distribution, which has statistical significance. At the same time, feature normalization is carried out, including intra class normalization and inter class normalization. First line intra class normalization: in order to reduce the information loss caused by the direct normalization of the image, after obtaining the feature vector, the data is normalized, and the extracted eigenvalues are normalized by selecting 64 * 64 according to the mean approach. Compared with the direct normalization of the image, the error caused by changing the original image can be avoided. Then, the Z-score

words and lines in writing. We can define the character spacing to represent the distance between calligraphy characters. Among them, it represents the horizontal spacing of calligraphy characters and represents the vertical spacing, is defined as formula(14).

$$\begin{cases} w_h = |topx_{i+1} - bottomx_i| \quad 1 \leq i \leq W \\ w_v = |topy_{j+1} - bottomy_j| \quad 1 \leq j \leq H \end{cases} \quad (14)$$

Two binary sets $(topx_i, topy_i)$, $(bottomx_i, bottomy_i)$ represent the coordinates of the upper left corner and the upper right corner of the minimum bounding box, respectively.

4. STYLE FEATURE VECTOR

4.1 SELECTION OF STYLE FEATURES

The style feature vector determined above may have invalid features, which needs further analysis.

4.1.1 DATA DESCRIPTIO

method is used to normalize the feature data to 0-1, which can reduce the influence of the huge difference of feature values on the classification accuracy and speed.

4.1.3 FEATURE SELECTIO

The ReliefF algorithm is used to calculate the weight of each feature, and the feature whose weight is less than a certain threshold is removed. In order to reduce the influence of different random samples on the result weight, the average weight value of 20 runs is used. Table 3 shows the attributes with the top eight feature weight means. The weight threshold was 0.0332.

Table 3 mean value of characteristic weight

attribute	Weighted mean
Stroke entropy	0.1079
Stroke width	0.0832
variance	0.0787
Knot shape	0.0643
Changes in the strength of writing	0.0694
Center of gravity position	0.0579
Stroke width of whole character	0.0458
Promoting Qi	0.0433

4.2 STYLE MODEL CONSTRUCTION

According to the probability distribution model of each type of calligraphy style in the training calligraphy style feature set, the calligraphy style directly affects the parameter value, which can effectively describe the calligraphy style characteristics. In this paper, BP neural network is used to construct the calligraphy style classification model, and the combination of genetic algorithm is used to improve the calculation speed and accuracy of the model[9-11].

4.2.1 BP NEURAL NETWORK MODEL

In this paper, a three-layer BP neural network is used, including input layer, hidden layer and output layer. Each layer is fully connected, and there is no connection in the same layer. After learning samples are input, the weights and deviations of the network are adjusted and trained repeatedly by using back propagation algorithm to make the output vector and the expected vector as close as possible. set up $X = (x_1, x_2, \dots, x_i)^T$ Represents the image feature set corresponding to network input, $X = (x_1, x_2, \dots, x_i)^T$ There are five types of calligraphy styles. BP neural network includes two sub processes: forward transfer and reverse transfer. Set the hidden layer output variable vector group as and the output layer output vector group as $Y = (y_1, y_2, \dots, y_m)^T$ The expected output vector group is $D = (d_1, d_2, \dots, d_i)^T$ The weight matrix from input layer to hidden layer is $W = (w_1, w_2, \dots, w_m)^T$ The weight matrix from hidden layer to input layer is $V = (v_1, v_2, \dots, v_i)^T$. For the output layer, there are defined as formula(15):

$$\begin{cases} h_t = f(s_t) & (t = 1, 2, \dots, i) \\ s_t = \sum_{j=1}^m v_{jt} y_j & (t = 1, 2, \dots, i) \end{cases} \quad (15)$$

For hidden layers, there are defined as formula(16):

$$\begin{cases} y_j = f(s_j) & (j = 1, 2, \dots, m) \\ s_j = \sum_{r=1}^m w_{rj} x_r & (j = 1, 2, \dots, m) \end{cases} \quad (16)$$

Among them, $f(x)$ is defined as formula(17):

$$f(x) = \frac{1}{1 + e^{-x}} \quad (17)$$

The error function is defined as formula(18):

$$E(w, v) = \frac{1}{2} \sum_{j=1}^m (d_j - y_j)^2 \quad (18)$$

The weight adjustment is defined as formula(19):

$$\begin{cases} \Delta w_{jt} = -\eta \frac{\partial E}{\partial w_{jt}} \\ \Delta v_{jt} = -\eta \frac{\partial E}{\partial v_{jt}} \end{cases} \quad (19)$$

4.2.2 CLASSIFICATION MODEL OF CALLIGRAPHY STYLE

1) Determine the number of input layer, hidden layer and output layer nodes.

According to the five types of calligraphy styles, the number of output layers is 5, and the hidden layer is 5.

2) The model algorithm flow is as follows:

Input: 30 dimensional features of calligraphy image to be classified.

Output: classification of calligraphy styles.

1. The feature data are normalized.

2. Network initialization. The weight matrix W and V are assigned random numbers by ourselves. The error E is 0 and the learning rate is 0.1.

3. Input layer input sample data to calculate the activity of hidden layer.

4. Calculate the output layer activity.

5. The output value of the model is compared with the actual value, and the error is calculated.

6. Back propagation, calculate the error of hidden layer.

7. Modify the weights between output layer and hidden layer, input layer and hidden layer respectively $w_{jt} \setminus v_{jt}$.

8. Modify the error.

Repeat steps 2 and 7 until the number of iterations reaches the upper limit or the error of the output layer reaches the threshold.

4.2.3 OPTIMIZATION OF CALLIGRAPHY STYLE MODEL

In order to avoid too much work and improve the calculation speed, genetic algorithm is applied to the classification model to optimize the threshold and weight of BP network to overcome the advantages of BP network. In this paper, the genetic algorithm is used to search the global optimum, and then the BP network is used to search the local optimum when reaching a certain convergence region to get more accurate classification results.

The experimental results show that the target error is obtained by training the BP neural network 126 times, and the classification accuracy is 95.33%. After the optimization, the target error can be obtained after 11 times of training, and the classification accuracy is 97.48%. Through the optimized style classification model, the calculation speed is fast, and the classification accuracy is more accurate.

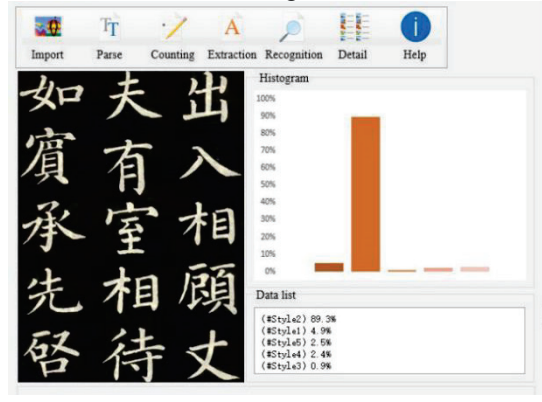
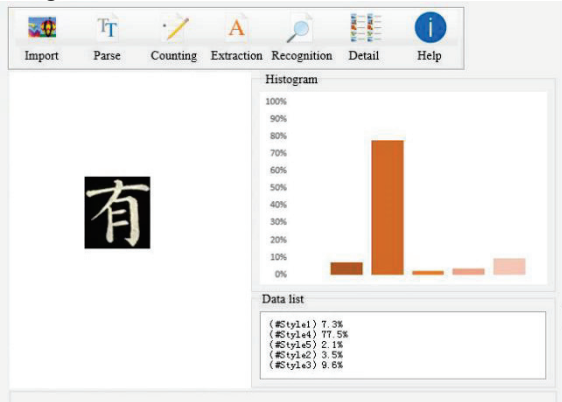
5. EXPERIMENTAL RESULTS AND ANALYSIS

5.1 EXPERIMENTAL ENVIRONMENT

This experiment uses Visual C++, QT is used to design the program interface, and the backstage database version is mysql8.0.

5.1.1 DATA SOURCE

The original data used in the experiment were collected from 280 page images of Yan Zhenqing, 260 pieces of Liu Gongquan, 260 pieces of Ouyang Xun, 220 pieces of Zhao Mengfu and 180 pieces of Dong Qichang's calligraphic works in the CADAL project of China and the






(a)Running interface - single word image (b) Operation interface
Fig. 4 system operation interface

Among them, the five categories of single character images have the highest classification probability. The first three schematic diagrams are shown in Fig 4. The third row and the third column of the third row are wrongly divided into European body, because there are similarities between European style and facial style, which leads to wrong classification in stroke characteristics. Table 5 shows the top two of the five categories of calligraphy page classification probability, but there is no wrong classification in the top ten calligraphy page classification probability. The reason is that the page is classified from three levels of stroke, knot and structure. The page contains several single characters. In the classification, the occasional misclassification of a few words has little impact on the image division of the whole calligraphy page. Table 4 top three of single character image style probability calculation

#style1	#style2	#style3	#style4	#style5
				
0.9872	0.9921	0.9931	0.9879	0.9901
				
0.9855	0.9889	0.9917	0.9868	0.9895
				
0.9803	0.9872	0.9892	0.9837	0.9871

Table 5 top two of page image style probability calculation

#style1	#style2	#style3	#style4	#style5
				
0.992	0.987	0.985	0.991	0.987
				
		0.979	0.989	

5.1.2 OPERATION RESULTS

When the user enters a work page, the classification result is obtained, as shown in Figure 4.

0.990	0.983			0.984
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5.2 EXPERIMENTAL ANALYSIS

In order to evaluate the effectiveness of the proposed algorithm, experiments are carried out on regular script calligraphy dataset[13-16].

5.2.1 EXPERIMENTAL ANALYSIS OF SINGLE CHARACTER IMAGE CLASSIFICATION

Firstly, single character images are classified and compared according to classification accuracy. This algorithm is compared with stroke structure feature + SVM algorithm, and classification algorithm based on delay style [2], lenet-5 [19], and Google net [20]. The current experimental data set is composed of images in regular script calligraphy dataset which are cut by minimum bounding box algorithm. The normalized size is 64 × 64. Each style contains 200 single characters. It is divided into five groups and is used as training set and test set according to the ratio of 4:1. The average classification accuracy of cross experiments on five test sets is shown in Table 5[17]. In the single word image classification, this algorithm has little advantage compared with other classification algorithms, and further carries on the comparative analysis to the page image classification experiment.

5.2.2 EXPERIMENTAL ANALYSIS OF SINGLE CHARACTER IMAGE

This experiment uses 10 times cross validation to get the average classification accuracy as the performance evaluation standard of calligraphy style classification algorithm, and also compares with the above four classification algorithms. Among them, the training set is selected from the regular script calligraphy data set, 600, 650, ..., 1100 calligraphy images are randomly selected, and the test set is the remaining image, and the average classification accuracy is obtained through ten cross experiments.

It can be seen from the above figure that when the number of samples is small, the classification accuracy rate is constantly improved, but when the number of training samples reaches 1000, the classification accuracy tends to

be stable. Compared with other classification algorithms, this algorithm achieves better classification results. Table 6 shows the comparison results of the classification accuracy of this algorithm and other algorithms when the number of training samples is 1000.

From table 7, it can be found that the accuracy of the classification algorithm based on Google net and the algorithm in this paper is better than other classification algorithms, reaching more than 90%. Compared with the Table 6 accuracy rate of single character image classification

	Stroke structure + SVM [17]	Latent style[2]	LeNet-5[19]	GoogleNet[20]	Proposed
#style1	77.00	81.41	80.40	87.12	88.90
#style2	72.00	90.28	92.42	90.54	89.30
#style3	75.00	88.30	86.58	90.08	91.00
#style4	78.00	81.80	84.75	85.35	87.35
#style5	68.00	89.21	76.85	88.25	89.65
Accuracy	74.00	86.20	84.20	88.29	89.24

Table 7 Comparison of classification results (%)

	Stroke structure + SVM [17]	Latent style[2]	LeNet-5[19]	GoogleNet[20]/	Proposed
#style1	73.00	83.25	86.28	92.33	97.90
#style2	80.00	89.78	89.64	95.67	98.30
#style3	60.00	92.25	91.30	93.00	99.00
#style4	75.00	85.28	90.63	90.52	96.3
#style5	67.00	88.85	84.55	93.44	95.9
Accuracy	71.00	87.88	88.48	93.39	97.48

Table 8 classification results

Predicted condition						
True condition		#style1	#style2	#style3	#style4	#style5
	#style1	0.979	0.012	0.002	0.002	0.005
	#style2	0.007	0.983	0	0.005	0.005
	#style3	0.005	0	0.990	0.005	0
	#style4	0.007	0.007	0.013	0.963	0.010
	#style5	0.016	0.008	0.002	0.016	0.959

The confusion matrix of five types of regular script classification in this paper is shown in Table 8. It can be seen from the table that the Euclidean has the highest classification accuracy, and 99% can be correctly divided into Euclidean. The classification accuracy of Dong style is relatively low, and it is mostly divided into Yan style and Zhao style. The classification accuracy of Zhao style is also relatively low, and it is often mistakenly divided into European style and Dong style. The other two types of books also have wrong classification. Because the style of calligraphy is similar, there will be misclassification, but most of the styles can be classified accurately with the help of this model.

6. CONCLUSION

This paper presents a method of calligraphy style classification, which takes calligraphy image as input and classification result as output. Although the classification of calligraphy style has achieved good accuracy, there are still some problems and areas to be improved. First, it is difficult to construct the mapping relationship between feature data and strokes. Second, this paper classifies the

accuracy of single character image classification, the algorithm in this paper improves the accuracy of page image classification greatly. As mentioned above, because of the large number of single words in page image, the influence of single word error classification is small, and the fault tolerance rate is high, so the classification accuracy of calligraphy page image is obviously better than other algorithms.

five types of regular script, which can not fully meet the needs of professional calligraphers. It needs to be improved automatically according to user feedback. The above two points need to be further solved in the follow-up study.

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MACGAN: Cartoon Style Transfer Based on Mixed Domain Attention

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Abstract: Image style transfer is a method to transform images from one style to another. With the development of generative adversarial network in deep learning, it's application in the image style transfer has attracted much attention. However, the existing methods usually have some problems and major problems mainly include: 1) the generated images have not obvious cartoon style; 2) the generated images lose some important textures of the original image; 3) the chromatic aberration inside the generated image is not obvious. To solve the above problems, we propose a generative adversarial network based on mixed attention called MACGAN. In this network, we first introduce the mixed attention module to make the internal chromatic aberration of the generated image more obvious. And the skip connection structure is adopted to preserve the important textures of the original image in the process of style transfer. In addition, a new residual block is introduced to reduce the number of model parameters and speed up the image generation. Finally, three datasets of Hayao, Paprika and Shinkai are used for experimental evaluation. The results show that our method is able to generate high-quality cartoon images from real-world photos. And we get the better FID than other methods.

Keywords: Image style transfer; Deep learning; Generative adversarial network; Attention mechanism

1. INTRODUCTION

Cartoon is a common art form in daily life. The cartoon style transfer refers to the transformation of real-world images into cartoon images. And in the process of transformation, the original image structure must not be destroyed. figure 1 shows an example of our method converting a real-world image into a Hayao style image. But in real life, it takes not only special expertise but also a lot of time for an artist to turn a realistic image into a cartoon-style image. Moreover, it is difficult for existing software to achieve satisfactory results. Therefore, it is necessary to propose a method that can transform real-world images into high quality cartoon style images.



(a) real-world image

(b) our result

Figure 1. An example of cartoon style transfer. (a) A real-world image, (b) The image (a) transfer to Hayao cartoon

style by our algorithm

Since the pioneering work of Gatys et al[1], the style transfer of image has received increasing attention. And with the development of deep learning, some algorithms [2,3,4,5] based on Convolution Neural Network (CNN) are widely applied to image style transfer. However, these existing neural network style transfer methods are usually only suitable for specific style transfer tasks. When they are used for cartoon style transfer, the generated images have no obvious cartoon style.

Then Goodfellow et al.[6] proposed generative adversarial network, many image style transfer methods based on GAN[7,8,9,10,11] have been proposed. CycleGAN[9] was the first to propose a style migration algorithm for unpaired images, which broke the limitation that the training set in Pix2pix[7], Pix2PixHD[8] must be paired, making the training set easier to obtain. CycleGAN has a good result on style transfer. However, in the cartoon style transfer, the generated cartoon image loses some important texture features of the original image, such as the outline of facial features, the edge outline of leaves and so on. The CartoonGAN[10] and AnimeGAN[11] are specially designed for cartoon style transfer, which can generate cartoon image well. However, there are still some defects in the chromatic aberration of the generated image. For example, the lipstick color of the lips on the face is not separated from the skin color, which results in the lipstick color of the lips being the same as the skin color.

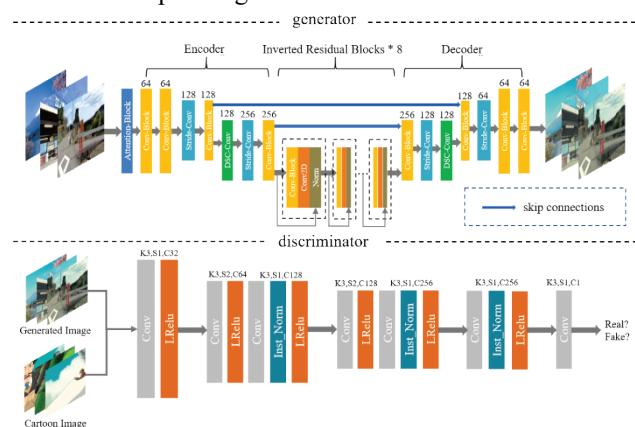


Figure 2. The generator and discriminator of MACGAN
The above methods are able to convert real-world images into cartoon images, but there are still some problems. 1) The generated images have no obvious cartoon style. 2) The generated image loses some important texture features of the original image; 3) The internal chromatic aberration of the generated image is not obvious. In order to solve

these problems, we propose a cartoon style transfer method based on the mixed domain attention mechanism, which can better transform real-world images into cartoon images. Our MACGAN is similar to the AnimeGAN, the biggest difference between both methods is the generator structure. In order to make the model more stable, we also used VGG network[12] to pre-train the generator before training MACGAN.

The main contributions of our work are:

- 1) We propose to add a mixed domain attention mechanism to the first layer of MACGAN generator, which can keep the internal chromatic aberration of cartoonized images unchanged;
- 2) The skip connections are used between inverted residuals;
- 3) We propose a new inverted residual block which can reduce the number of model parameters and speed up the image generation.

2. RELATED WORK

2.1 Neural Style Transfer (NST)

NST use the convolutional neural network (CNN) to transfer the input image from one style to another. Gatys et al.[14,15,16,17] proposed a series of image style transfer technique based on CNN, but their network model often have a great number of parameters, which make the process of style transfer time consuming. Huang et al.[18] propose a effective approach, named AdaIN, which aligns the mean and variance of the content image features with those of the style image features. However, those methods only suitable for specific style transfer tasks. They can't obtain satisfactory results when used for cartoon style transfer.

2.2 Image style transfer with GANs

In recent years, a series of GAN based approaches for image style transfer have been proposed [7,8,9,10,11], which can be divided into two categories: style transfer of paired and unpaired. The traditional approaches of paired are Pix2pix[7] and Pix2PixHD[8]. Their training datasets require pairs of images with consistent content but inconsistent style, which have the disadvantage of insufficient datasets. Until the emergence of unpaired image style transfer, such as CycleGAN[9], CartoonGAN[10] and AnimeGAN[11]. These approaches can be trained by using only two datasets with different styles, which greatly reduces the difficulty of obtaining datasets. CycleGAN first proposed the cycle architecture, which consists of two pairs of generators and discriminators. The first pair of generator and discriminator learn the mapping from the original style to the target style, and the second pair learns the mapping from the target style to the original style. CycleGAN is able to perform some style transfer tasks excellently. However, when generating cartoon style images, a large number of original image features are often lost, resulting in the migrated images having cartoon style but unclear texture. CartoonGAN and AnimeGAN are specially used for cartoon style transfer, which have a good result in generate cartoon image, but the internal chromatic aberration of generated image will be inconsistent with the original image. Furthermore, it's time consuming to

achieve cartoon style transfer.

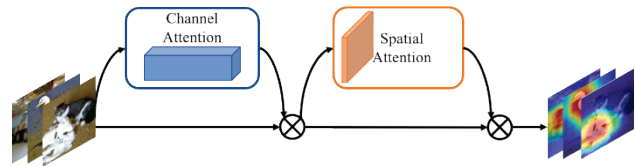


Figure 3. Mixed attention block

2.3 attention mechanism

The attention mechanism can process visual information adaptively and focus on significant areas by imitating the process of human observation. This mechanism can quickly extract important features of image, so it is widely used in computer vision tasks [19,20,21,22,23,24]. The mixed domain attention mechanism includes the channel domain attention mechanism and the spatial domain attention mechanism, as show in figure 3. The channel attention mechanism focuses on the channel characteristics of the image while the spatial attention mechanism focuses on the spatial characteristics of the image. According to [24], we have the best result on the order of channel attention and spatial attention. And the structure of mixed attention mechanism can be seen in 3.2.

3. OUR METHOD

3.1 MACGAN architecture

In this paper, we present a better and more efficient generative adversarial network called MACGAN. MACGAN contains two convolution neural networks, as show in figure 2: one is generator G which is used to transform real-world images into cartoon styles, another is discriminator D which is used to distinguish the input image is real cartoon image or not.

In figure 2, the first layer of the generator is a mixed domain attention mechanism which include domain attention and spatial domain attention. This mechanism can extract the chromatic aberration feature of the origin images. Inspired by the U-net network[13], the following generator structure is composed of encoder, residual blocks and decoder. The skip connections well solve the detail loss during the down sampling of our network.

In the encoder, the head contains two layers of Conv-Block. And the downsampling (Stride-Block) is carried out twice. After each downsampling, a Conv-Block is included. Furthermore, there is a DSConv Block between the two downsamplings. The structure of Conv-Block and DSConv block are the same with[11]. Stride-Conv is shown in figure 4(b), where the convolution kernel size is 3×3 and the stride is 2.

The specific structure of the IRB block is shown in figure 4(a). Compare to the IRB block in [11] we removed the Depthwise_conv to reduce the parameters of our model. 8 IRB blocks are used in our generator.

The decoder and the encoder present a symmetrical structure. The convolution kernel size and stride of Stride-Conv in decoder is 3×3 and 1/2.

Our discriminator are the same as [11]. As shown in Figure 3, all convolutional layers in the discriminator are standard convolution, and spectral normalization is used for each layer to make the training more stable.

3.2 Mixed domain attention mechanism

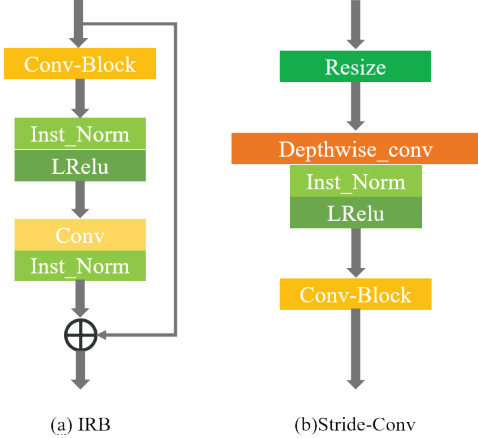
As shown in figure 3, the mixed domain attention mechanism consists of a channel domain attention and a spatial domain attention. The feature map of the input image, Mixed attention block sequentially infers a 1D channel attention map and a 2D spatial domain attention map, The whole calculation process is:

$$F' = M_C(F) \otimes F,$$

$$F'' = M_S(F') \otimes F'$$

(1)

where \otimes represents element-wise multiplication, F' is the result of the original image feature map passing through the channel domain attention, F'' is the final refined output. The complete structure of channel domain attention and spatial domain attention are similar to [24].



(a) IRB

(b) Stride-Conv

Figure 4. IRB block and Stride-Conv block

3. 3 Loss function

We formulate the process of learning to transform real-world photo to cartoon images as a mapping model which maps the real-world photo domain X to the cartoon domain Y . The mapping model is trained with unpaired training data $S_{data}(x) = \{x_i | i = 1, \dots, N\} \subset X$ and $S_{data}(y) = \{y_i | i = 1, \dots, M\} \subset Y$, where the N and M are the numbers of real-world photos and cartoon images in the train dataset, respectively.

The loss function employed in this paper is the same as [11], which consists of four losses:

$$L(G, D) = \omega_{adv} L_{adv}(G, D) + \omega_{con} L_{con}(G, D) + \omega_{gra} L_{gra}(G, D) + \omega_{col} L_{col}(G, D) \quad (2)$$

where ω_{adv} , ω_{con} , ω_{gra} , ω_{col} are the weights to balance four given loss functions. And in all our experiments we set $\omega_{adv} = 300$, $\omega_{con} = 1.5$, $\omega_{gra} = 3$, $\omega_{col} = 10$.

$L_{adv}(G, D)$ is the adversarial loss to make the process of training more stable and make the MACGAN to generate higher quality images. The least squares loss function in LSGAN[25] is employed as $L_{adv}(G, D)$.

$L_{con}(G, D)$ is the content loss:

$$L_{con}(G, D) = E_{x_i \sim S_{data}(x)} [\|VGG_l(x_i) - VGG_l(G(x_i))\|_1] \quad (3)$$

where $VGG_l(\bullet)$ is the l th layer of VGG19 and the

“ \bullet ” is input. The $G(x_i)$ means the generated images and x_i means real-world photos.

$L_{gra}(G, D)$ is the gray style loss:

$$L_{gra}(G, D) = E_{x_i \sim S_{data}(x)}, E_{g_i \sim S_{data}(g)} [\|Gram(VGG_l(G(x_i))) - Gram(VGG_l(g_i))\|_1] \quad (4)$$

where Gram means the Gram matrix of features. g_i means the color cartoon image y_i in $S_{data}(y_i)$ is transformed to grayscale image. $VGG_l(\bullet)$ and $G(\bullet)$ are the same to the $L_{adv}(G, D)$.

$L_{col}(G, D)$ is the color reconstruction loss:

$$L_{col}(G, D) = E_{x_i \sim S_{data}(x)} \left[\begin{aligned} &\|Y(G(x_i)) - Y(x_i)\|_1 \\ &+ \|U(G(x_i)) - U(x_i)\|_H \\ &+ \|V(G(x_i)) - V(x_i)\|_H \end{aligned} \right] \quad (5)$$

where $Y(x_i)$, $U(x_i)$, $V(x_i)$ represent three channels of x_i in YUV format, respectively. And the H represents Huber Loss.

3.4 Training

The proposed MACGAN can easily realize the cartoon style transfer of unpaired images. However, the GAN model is highly nonlinear and easy to fall into a local minimum. The pretraining phase of the generator can make the generative adversarial network to converge better. In the pre-training of the generator, we only trained one epoch and the learning rate was set to 0.0001. In the formal training stage, we set the learning rate of the generator to 0.00008 and the learning rate of the discriminator to 0.0001. 100 epochs was trained. The deep learning framework we used is TensorFlow, and the GPU is Tesla T4.

4. EXPERIMENTS

4.1 Data

The experimental data can find in <https://github.com/TachibanaYoshino/AnimeGAN/releases/tag/dataset-1>. The training data include real-world images and cartoon images, and the size of the images was cropped to 256×256. while the testing data are only real-world images. In our experiment, there were 7,493 real-world images. 6,657 of which were used for training and the rest for testing. For the cartoon images, 1553 cartoon images from the movie “Paprika” are used for training the Kon Satoshi style model, 1650 cartoon images from the movie “Your Name” are used for training the Makoto Shinkai style model and 1792 cartoon images from the movie “The Wind Rises” are used for training the Miyazaki Hayao style model.

4.2 Ablation experiments

4.2.1 Mixed domain attention mechanism:

We used 6,657 real life images and 1,792 Hayao Miyazaki style images to train the model with and without mixed domain attention mechanism respectively, and the results are shown in figure 5. figure 5(a) represents the real-image, figure 5(b) represents the results of the unapplied mixed domain attention mechanism, and figure 5(c) represents the

results of the added mixed domain attention mechanism. Comparing figure 5(b) and figure 5(c), we can conclude that the model with mixed domain attention mechanism can well retain the chromatic aberration of the original image. Furthermore the colors of the generated images are more cartoonish.

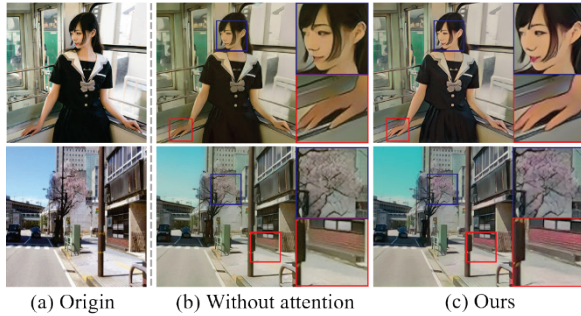


Figure 5. The effects of mixed attention mechanism

4.2.2 Skip connections

The dataset is the same as 4.2.1. Models with and without skip connections are trained respectively, and the results are shown in figure 6. figure 6 (a) represents the real-world image, figure 6(b) represents the results of the model without skip connections, and figure 6(c) represents the results of the model with skip connections added. Comparing figure 6(b), it can be seen in figure 6(c) that the model without skip connections loses most of the texture of the original image. The addition of skip connections able to retain the important texture of the original image.

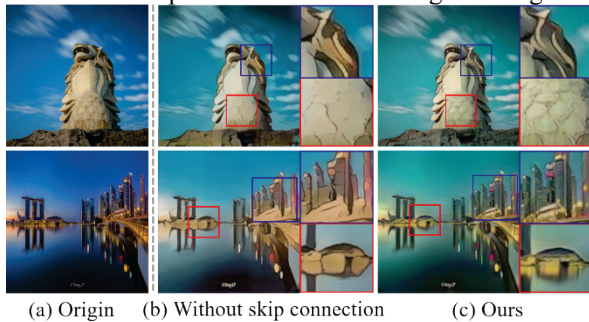


Figure 6. The effects of skip connections

4.2.3 New IRB block:

We added the new IRB block to MACGAN's generator, and then compared the size and performance of the three generator models, respectively. Since there was no IRB block in CycleGAN we compared it only with CartoonGAN and AnimeGAN. All the testing images are resized to 256×256. As show in table 1, Our model has the smallest size of parameters and model size. And our inference time is the shortest than other models. We can conclude that our model is smaller and more efficient.

Table 1 Indicators of generator

Network	Params	Model Size	Inference Time
CartoonGAN	12253152	46.74M	51ms/image
AnimeGAN	3956096	15.09M	43ms/image
Ours	3911149	14.92M	41ms/image

4. 3 Comparison with state of the art

4.3.1 Qualitative comparison

We compared with CycleGAN, CartoonGAN and

AnimeGAN, respectively. To be fair, we used a uniform training set to train their respective models separately. The training set include 6, 657 real-world images and 1, 792 cartoon images of Miyazaki Hayao style. The results of our experiments are shown in figure 7. Infer from figure7(b), although CycleGAN generates cartoonized images, the texture structure of the cartoonized image is not clear, resulting in the difficulty in identifying the image content. As show in figure7(c), the cartoon images produced by CartoonGAN have a reddish brown color, which differs from Miyazaki Hayao style. In figure7(d), the textural features of AnimeGAN is better than Cartoon, but some details of the texture are not clear enough. Furthermore, the internal chromatic aberration of images are not obvious. In the first row of figure 7(d), the lipstick color of the lips on the face is not separated from the skin color. In figure7(e), the proposed MACGAN can not only generate cartoon-style images with clear texture, but also retain the chromatic aberration of the original image.

4.3.2 FID

Frechet Inception Distance (FID)[26] is widely used to evaluate the quality of the generated images. Pre-trained Inception-V3 model[27] can extract the advanced features of an image and calculate the distance between two image distributions. The FID value is smaller when the characteristics of two images are more similar. As the facial data have not been trained in the CartoonGAN model, FID was calculated only on the landscape dataset for the purpose of equitable comparisons. As table 2 shows, CycleGAN has the smallest FID to Cartoon images. And our has the second FID to Cartoon images. This indicates that the images generated by CycleGAN are the closest to cartoon images. The images generated by our method are more cartographic than those generated by AnimeGAN and CartoonGAN. Our method has the smallest FID to real-world photo while the CycleGAN is the largest. CartoonGAN and AnimeGAN have the middle FID to real-world. It shows that the image generated by CycleGAN loses a lot of features of the original image, while our method can well retain the important features of the original image. Furthermore, our method was able to maintain significant features of the original images while maintaining better cartoon performance than CartoonGAN and AnimeGAN.

4.4 Verify the cartoon style transfer of different dataset

In order to effectively verify the cartoon style transfer of our proposed MACGAN, we trained our model on three different cartoon datasets respectively. In figure 8, we have a high-quality cartoon transfer on the three styles of Paprika, Shinkai and Hayao.

Table 2. Performance evaluation based on the FID metric. See also the manuscript for expositions about the FID metric. Lower is better for the FID metric.

Method	CycleGA	CartoonGA	AnimeGA	Ours
s	N	N	N	
FID to	238.44	273.36	279.71	278.8
Cartoon				4
FID to	310.52	272.79	244.89	241.4
Photo				0

Note: Black bold font indicates the smallest FID, the red

indicates the second smallest FID.



Figure 7. Comparison with state of the art

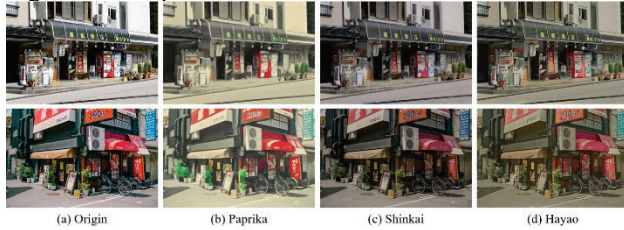


Figure 8. Cartoon style transfer on different datasets

5. CONCLUSIONS

In this paper, a method of image style transfer based on mixed domain attention is proposed, which can effectively transfer the real-world images to cartoon style images. In addition, MACGAN can ensure that the original image's chromatic aberration and texture features are well preserved on the basis of cartoon style transfer, and the image generation more efficiently than other generative adversarial networks. We proposed three optimization schemes: 1) A mixed domain attention mechanism is introduced to preserve the original realistic image chromatic aberration; 2) The skip connections structure is used to preserve the important texture of the original images; 3) The new IRB blocks is introduced to make image generation faster. The experimental results show that the proposed MACGAN can realize the style transfer of cartoon images with high quality and efficiency.

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Non-Collocated Control of Semilinear Distributed Parameter Systems Via Mobile Actuator-Sensor Networks

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Abstract: This paper focuses on the non-collocated control design for an array of semilinear distributed parameter systems. The optimization proposal of stabilization in diffusion processes is used by mobile actuator and sensor networks. Based on the Lyapunov direct method, a series of conditions are established in the form of decentralized output feedback control scheme. The stability criteria which related to the velocity law of moving agents ensuring the distributed parameter systems to be globally asymptotically stable. And the results improve and extend the earlier works. Finally, a simulation study is provided to verify the obtained results.

Keywords: Semilinear Distributed Parameter Systems; Non-Collocated Control; Decentralized Output Feedback; Mobile Sensors; Mobile Actuators

1. INTRODUCTION

In general, the behavior of distributed parameter systems is determined by position in addition to time. Many physical processes are modeled by distributed parameter systems, such as heat exchange, fluid, chemical reaction and other space-time processes. Orlov[1] studied the model of distributed parameter control systems in heat processing using sliding mode control method for the first time. However, it is especially difficult to avoid the wobble phenomenon. Then, the analysis and control of parabolic partial differential equations with input constraints based on Galerkin approximation is developed in [2]. Investigating such finite-dimensional control systems becomes a challenging task. In this way, several methods have been presented for distributed parameter systems. Song[3] studied the robust stabilization problem of Markovian jump distributed parameter systems via Takagi-Sugeno fuzzy theory. Also, time-varying delay and incomplete transition probabilities are studied, which affect the stochastically stability of the system. A regional constrained optimal control issue of a class of semilinear distributed parameter systems is studied in [4] by a quadratic cost functional and a closed convex. Moreover, systematic approach is often used to deal with the semilinear distributed parameter systems. [5] presented distributed saturated control problem of semilinear fuzzy-PDE model by applying the sum-of-squares techniques. Also, the observation issue of semilinear distributed parameter systems has been considered in [6]. An extended Luenberger observer is designed based on backstepping technique and sample-and-hold also implementation to improve the efficiency of the observer.

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Earlier work on study of [7] introduced a motion control for collaborative target tracking in mobile sensor networks. Compared to the static actuators and sensors, mobile ones regard to reduction in power consumption, improved performance and efficient monitoring. Almost at the same time, the study on mobile control of moving actuators and sensors in processes governed by distributed parameter systems in [8-9]. Uciński[10] enhanced the computational optimality of supervisory control scheme. Demetriou[11-13] provided an abstract framework for the performance improvement of mobile sensors and actuators in distributed parameter systems using the Lyapunov stability arguments. So far, a number of useful conclusions about control of distributed parameter systems are obtained.

Focusing on semilinear distributed parameter systems with Dirichlet boundary condition, the goal of this paper is finding a decentralized output feedback control scheme which gives a control profile ensuring the distributed parameter systems to be globally asymptotically stable faster. The optimization proposal of stabilization in diffusion processes is used by mobile actuator and sensor networks in practice. By using Lyapunov functional, a series of conditions which related to the velocity law of moving agents ensure stability of closed-loop system in initial conditions. The effectiveness of the obtained results is tested in the last part of this paper.

2. PROBLEM FORMULATION

Consider an array of n -input, n -output semilinear distributed parameter systems which is described the diffusion process:

$$\begin{aligned} \frac{\partial x(t, \xi)}{\partial t} &= \frac{\partial}{\partial \xi} \left(a(\xi) \frac{\partial x(t, \xi)}{\partial \xi} \right) \\ &\quad - \phi(t, \xi, x(t, \xi)) x(t, \xi) \\ &\quad + \sum_{i=1}^n f_i(\xi; \xi_i^a(t)) u_i(t), \\ y(t) &= \begin{bmatrix} \int_0^l g_1(\xi; \xi_1^s(t)) x(t, \xi) d\xi \\ \int_0^l g_2(\xi; \xi_2^s(t)) x(t, \xi) d\xi \\ \vdots \\ \int_0^l g_n(\xi; \xi_n^s(t)) x(t, \xi) d\xi \end{bmatrix}, \end{aligned} \quad (1)$$

with the initial condition

$$x(0, \xi) = x_0(\xi), \quad (2)$$

and having Dirichlet boundary condition

$$x(t, 0) = x(t, l) = 0, \quad (3)$$

where $x(t, \xi)$ denotes the state of the system, $\xi \in \Omega = [0, l]$ is the spatial variable and $t \in \mathbf{R}^+$ is the time variable. The diffusion operator $a(\xi) \geq a_0 > 0$. Nonlinear function ϕ satisfy $\phi \leq \phi_M$, where ϕ_M is known bound. The nonnegative function $f_i(\xi; \xi_i^a(t))$ denotes the spatial distribution of i th mobile actuator, where $\xi_i^a(t) \in [0, l]$ is the time-varying centroid of i th actuator. Similarly, the spatial distribution of i th mobile sensor is represented by the nonnegative function $g_i(\xi; \xi_i^s(t))$, where $\xi_i^s(t) \in [0, l]$ is the time-varying centroid of i th sensor. $u_i(t)$ is the control input.

Then, the system (1) can be rewritten in the following compact form:

$$\begin{cases} \dot{x}(t) = \mathcal{A}x(t) + \mathcal{F}(\xi^a(t))u(t), \\ y(t) = \mathcal{G}(\xi^s(t))x(t), \end{cases} \quad (4)$$

$L_2(\Omega)$ is a Hilbert space, where $x(t, \cdot) = \{x(t, \xi): 0 \leq \xi \leq l\}$ is the instantaneous state of the system. Let infinitesimal operator $\mathcal{A} = \frac{d}{d\xi} \left(a(\xi) \frac{d}{d\xi} \right) - \phi_M$, its domain

$\mathcal{D}(\mathcal{A}) = \{\psi \in L_2(\Omega): \psi, \psi' \text{ absolutely continuous}$

$\psi'' \in L_2(\Omega), \psi(0) = \psi(l) = 0\}$. Operator \mathcal{A} bounded and $-\mathcal{A} > 0$, due to $a(\xi) > 0$. Linear operator $\mathcal{F}(\xi^a(t))$ is input operator related to mobile actuators. Actuator location vector provided by $\xi^a(t) = [\xi_1^a(t), \xi_2^a(t), \dots, \xi_n^a(t)]^T$. Similarly, the output operator $\mathcal{G}(\xi^s(t))$ is also linear and bounded. The vector of sensor location parameterized by $\xi^s(t) = [\xi_1^s(t), \xi_2^s(t), \dots, \xi_n^s(t)]^T$ [14-15].

In what follows, the spatial distribution of each mobile actuator which centroid at ξ_i^a , given by

$$f_i(\xi; \xi_i^a) = \begin{cases} 1 & \text{if } \xi \in [\xi_i^a - \varepsilon^-, \xi_i^a + \varepsilon^+] \\ 0 & \text{otherwise} \end{cases}, \quad (5)$$

or depict

$$f_i(\xi; \xi_i^a) = [H(\xi - (\xi_i^a - \varepsilon^-)) - H(\xi - (\xi_i^a + \varepsilon^+))], \quad (6)$$

what using two different Heaviside functions. Each mobile sensor which centroid at ξ_i^s follow the spatial distribution as

$$g_i(\xi; \xi_i^s) = \begin{cases} 1 & \text{if } \xi \in [\xi_i^s - \vartheta^-, \xi_i^s + \vartheta^+] \\ 0 & \text{otherwise} \end{cases}, \quad (7)$$

or depict

$$g_i(\xi; \xi_i^s) = g_i(\xi) [H(\xi - (\xi_i^s - \vartheta^-)) - H(\xi - (\xi_i^s + \vartheta^+))]. \quad (8)$$

Combined with the decentralized static output feedback control scheme, we design the following controller

$$u_i(t) = -k_i y_i(t) = -k_i \int_0^l g_i(\xi; \xi_i^s(t)) x(t, \xi) d\xi, \quad (9)$$

for $k_i > 0, i = 1, 2, \dots, n$.

Also, it can be written in matrix form

$$u(t) = -Ky(t), \quad (10)$$

with $K = \text{diag}\{k_1, k_2, \dots, k_n\}$ is the control gain matrix.

In fact, the locally decentralized controller (9) or (10) for actuators and sensors can be utilized effectively owing to the advanced technology of actuation and sensing. The recent advances of micro-electro-mechanical systems, make it easy to implement this class of controllers in a large number of moving actuators and sensors.

3. MAIN RESULTS AND PROOFS

To obtain the main results, definitions and lemmas are

introduced as follows:

Definition 1 The distributed parameter systems is said to be globally asymptotically stable if $\lim_{t \rightarrow +\infty} |x(t)| = 0$ holds.

Lemma 1 (Barbalat's Lemma[16]) If a non-negative function $f(t)$ is Lebesgue integrable and uniformly continuous on $[0, +\infty)$, then $\lim_{t \rightarrow +\infty} f(t) = 0$.

With the decentralized output feedback control policy (10), we can study the system in the following form

$$\dot{x}(t) = \mathcal{A}_c(\xi(t))x(t) \quad (11)$$

where $\mathcal{A}_c(\xi(t)) = \mathcal{A} - \mathcal{F}(\xi^a(t))K\mathcal{G}(\xi^s(t))$. In this case, one may easily assume that $\mathcal{F}(\xi^a(t))$ and $\mathcal{G}(\xi^s(t))$ are commutative, then the product of $\mathcal{F}(\xi^a(t))$ and $\mathcal{G}(\xi^s(t))$ is nonnegative definite. Consequently, $\mathcal{F}(\xi^a(t))K\mathcal{G}(\xi^s(t))$ is bounded and nonnegative definite. Also, $-\mathcal{A}_c(\xi(t))$ is bounded and nonnegative definite.

The main results of this paper are given in the following theorem.

Theorem 1 Under the decentralized static output feedback control scheme (10), semilinear distributed parameter systems (4) is globally asymptotically stable, if the spatial distribution of mobile actuators and sensors are given by (5) and (7) respectively and satisfy $[\xi_i^a - \varepsilon^-, \xi_i^a + \varepsilon^+] \cap [\xi_i^s - \vartheta^-, \xi_i^s + \vartheta^+] \neq \emptyset$, such that the following velocity law of each moving agent holds,

$$\dot{\xi}_i^a(t) = -\rho_i^a k_i W_i^a \quad (12)$$

$$\dot{\xi}_i^s(t) = -\rho_i^s k_i W_i^s \quad (13)$$

with $\rho_i^a > 0$ and $\rho_i^s > 0, i = 1, 2, \dots, n$, are velocity gain of each agent, where the expression of W_i^a and W_i^s are depend on the mobile actuators and sensors intersecting part of the spatial distribution of zone, also express as following:

$$(i) [\xi_i^a - \varepsilon_i^-, \xi_i^a + \varepsilon_i^+] \subset [\xi_i^s - \vartheta_i^-, \xi_i^s + \vartheta_i^+] \\ W_i^a = x^2(t, \xi_i^a - \varepsilon_i^-) - x^2(t, \xi_i^a + \varepsilon_i^+); \quad (14)$$

$$W_i^s = 0; \quad (15)$$

$$(ii) [\xi_i^s - \vartheta_i^-, \xi_i^s + \vartheta_i^+] \subset [\xi_i^a - \varepsilon_i^-, \xi_i^a + \varepsilon_i^+] \\ W_i^a = 0; \quad (16)$$

$$W_i^s = x^2(t, \xi_i^s - \vartheta_i^-) - x^2(t, \xi_i^s + \vartheta_i^+); \quad (17)$$

$$(iii) [\xi_i^s - \vartheta_i^-, \xi_i^s + \vartheta_i^+] \cap [\xi_i^a - \varepsilon_i^-, \xi_i^a + \varepsilon_i^+] = [\xi_i^a - \varepsilon_i^-, \xi_i^s + \vartheta_i^+]$$

$$W_i^a = x^2(t, \xi_i^a - \varepsilon_i^-), \quad (18)$$

$$W_i^s = -x^2(t, \xi_i^s + \vartheta_i^+); \quad (19)$$

$$(iv) [\xi_i^a - \varepsilon_i^-, \xi_i^a + \varepsilon_i^+] \cap [\xi_i^s - \vartheta_i^-, \xi_i^s + \vartheta_i^+] = [\xi_i^s - \vartheta_i^-, \xi_i^a + \varepsilon_i^+]$$

$$W_i^a = -x^2(t, \xi_i^a + \varepsilon_i^+), \quad (20)$$

$$W_i^s = x^2(t, \xi_i^s - \vartheta_i^-). \quad (21)$$

The guidance scheme for mobile agents enhances the controller performance in the sense that the state x converges to zero faster.

Proof: Consider the following parameter-dependent Lyapunov functional as

$$V(t) = -\langle x(t), \mathcal{A}_c(\xi(t))x(t) \rangle, \quad (22)$$

where the boundedness and nonnegative definite of the operator $-\mathcal{A}_c(\xi(t))$ easily see from the discussion above. Differentiation of $V(t)$ with respect to time along with the solution of system (12) yields

$$\dot{V}(t) = -2\langle x(t), \mathcal{A}(\xi(t))x(t) \rangle - \left\langle x(t), \frac{d\mathcal{A}_c(\xi(t))}{dt}x(t) \right\rangle. \quad (23)$$

By using the properties of the operators $-\mathcal{A}_c(\xi(t))$, the following results deduced easily.

$$\begin{aligned} & -2\langle x(t), \mathcal{A}(\xi(t))x(t) \rangle \\ & = -2|\mathcal{A}_c(\xi(t))x(t)| \leq 0. \end{aligned} \quad (24)$$

Then, the second one of (24) has

$$\begin{aligned} & -\left\langle x(t), \frac{d\mathcal{A}_c(\xi(t))}{dt}x(t) \right\rangle \\ & = \langle x(t), \frac{d}{dt}(\mathcal{F}(\xi^a(t))K\mathcal{G}(\xi^s(t)))x(t) \rangle \\ & = \left\langle x(t), \xi^a(t) \frac{\partial \mathcal{F}(\xi^a(t))}{\partial \xi} K\mathcal{G}(\xi^s(t))x(t) \right\rangle \\ & + \left\langle x(t), \mathcal{F}(\xi^a(t))K\dot{\xi}^s(t) \frac{\partial \mathcal{G}(\xi^s(t))}{\partial \xi} x(t) \right\rangle \end{aligned} \quad (25)$$

The formula (26) proposed here consists of two parts: one is used to determine the velocity of i th moving actuating device; and the other is employed to determine the velocity of i th moving sensing device.

The first term in (26) can be written in terms of the integral representation, that is,

$$\begin{aligned} & \langle x(t), \xi^a(t) \frac{\partial \mathcal{F}(\xi^a(t))}{\partial \xi} K\mathcal{G}(\xi^s(t))x(t) \rangle \\ & = \int_0^l \xi^a(t) \frac{\partial f(\xi; \xi^a)}{\partial \xi} x^2(t, \xi) K\mathcal{G}(\xi^s) d\xi \\ & = \sum_{i=1}^n k_i \xi_i^a(t) \int_0^l \frac{\partial}{\partial \xi} [(H(\xi - (\xi_i^a - \varepsilon_i^-)) - H(\xi - (\xi_i^a + \varepsilon_i^+)))] x^2(t, \xi) \\ & \quad \times [(H(\xi - (\xi_i^s - \vartheta_i^-)) - H(\xi - (\xi_i^s + \vartheta_i^+)))] d\xi \\ & = \sum_{i=1}^n k_i \xi_i^a(t) \int_{\xi_i^s - \vartheta_i^-}^{\xi_i^s + \vartheta_i^+} [\delta(\xi - (\xi_i^a - \varepsilon_i^-)) - \delta(\xi - (\xi_i^a + \varepsilon_i^+))] x^2(t, \xi) g_i(\xi) d\xi \end{aligned}$$

For presentation convenience, we denote

$$W_i^a = \int_{\xi_i^s - \vartheta_i^-}^{\xi_i^s + \vartheta_i^+} [\delta(\xi - (\xi_i^a - \varepsilon_i^-)) - \delta(\xi - (\xi_i^a + \varepsilon_i^+))] x^2(t, \xi) d\xi. \quad (26)$$

And, for ρ_i^a is any positive gain, it can be made negative by the choice

$$\dot{\xi}_i^a(t) = -\rho_i^a k_i W_i^a,$$

where the expression of W_i^a can be calculated as the form of (14) in $[\xi_i^a - \varepsilon_i^-, \xi_i^a + \varepsilon_i^+]$, (16) in $[\xi_i^s - \vartheta_i^-, \xi_i^s + \vartheta_i^+]$, (18) in $[\xi_i^a - \varepsilon_i^-, \xi_i^s + \vartheta_i^+]$ and (20) in $[\xi_i^s - \vartheta_i^-, \xi_i^a + \varepsilon_i^+]$.

The second term in (25) is calculated as follows

$$\begin{aligned} & \langle x(t), \mathcal{F}(\xi^a(t))K\dot{\xi}^s(t) \frac{\partial \mathcal{G}(\xi^s(t))}{\partial \xi} x(t) \rangle \\ & = \int_0^l f(\xi; \xi^a) K\dot{\xi}^s(t) \frac{\partial g(\xi; \xi^s)}{\partial \xi} x^2(t, \xi) d\xi \\ & = \sum_{i=1}^n k_i \dot{\xi}_i^s(t) \int_0^l \frac{\partial}{\partial \xi} [(H(\xi - (\xi_i^s - \vartheta_i^-)) - H(\xi - (\xi_i^s + \vartheta_i^+)))] x^2(t, \xi) \\ & \quad \times [(H(\xi - (\xi_i^a - \varepsilon_i^-)) - H(\xi - (\xi_i^a + \varepsilon_i^+)))] d\xi \\ & = \sum_{i=1}^n \dot{\xi}_i^s(t) \int_{\xi_i^a - \varepsilon_i^-}^{\xi_i^a + \varepsilon_i^+} [\delta(\xi - (\xi_i^s - \vartheta_i^-)) - \delta(\xi - (\xi_i^s + \vartheta_i^+))] x^2(t, \xi) f_i(\xi) d\xi k_i \end{aligned}$$

We denote

$$W_i^s = \int_{\xi_i^a - \varepsilon_i^-}^{\xi_i^a + \varepsilon_i^+} [\delta(\xi - (\xi_i^s - \vartheta_i^-)) - \delta(\xi - (\xi_i^s + \vartheta_i^+))] x^2(t, \xi) d\xi. \quad (27)$$

Then, choose

$$\dot{\xi}_i^s(t) = -\rho_i^s k_i W_i^s,$$

for ρ_i^s is any positive gain. W_i^s can be calculated as the expression of (15) in $[\xi_i^a - \varepsilon_i^-, \xi_i^a + \varepsilon_i^+]$, (17) in $[\xi_i^s - \vartheta_i^-, \xi_i^s + \vartheta_i^+]$, (19) in $[\xi_i^a - \varepsilon_i^-, \xi_i^s + \vartheta_i^+]$ and (21) in $[\xi_i^s - \vartheta_i^-, \xi_i^a + \varepsilon_i^+]$.

From the above discussion, we have $\dot{V}(t) \leq -2|\mathcal{A}_c(\xi(t))x(t)|^2 \leq 0$. It follows from (24)-(27) that

$$\dot{V}(t) \leq -c|x(t)|^2, t \geq 0,$$

Therefore, we have

$$V(t) - V(0) \leq -c \int_0^t |x(s)|^2 ds.$$

Hence, it implies that

$$\int_0^t |x(s)|^2 ds \leq \alpha(|x_0|^2 + |\mathcal{A}x_0|^2) < +\infty.$$

Moreover, it is not difficult to verify that $|x(t)|$ is uniformly continuous on $[0, +\infty)$. From Lemma 1, we can obtain

$$\lim_{t \rightarrow +\infty} |x(t)| = 0.$$

Accordingly, the system (4) is globally asymptotically stable.

Remark 1: The spatial distribution of each mobile agent discussed in (5) and (7), implies that the mobile actuator and sensor networks is homogeneous. In such network, every actuator and sensor is identical to each other, only different at the location of their centroids ξ_i^a and ξ_i^s .

Further, the spatial distribution of agents satisfy $[\xi_i^a - \varepsilon_i^-, \xi_i^a + \varepsilon_i^+] = [\xi_i^s - \vartheta_i^-, \xi_i^s + \vartheta_i^+]$, which means that each mobile actuator and sensor are moving in the same range. For simplicity, we denote $[\xi_i^a - \varepsilon_i^-, \xi_i^a + \varepsilon_i^+] = [\xi_i^s - \vartheta_i^-, \xi_i^s + \vartheta_i^+] = [\xi_i - \epsilon, \xi_i + \epsilon]$. Then, we obtain the following theorem easily.

Theorem 2 Under the decentralized static output feedback control scheme (10), semilinear distributed parameter system (4) is globally asymptotically stable, if the spatial distribution of mobile actuators and sensors are given by (5) and (7) respectively and satisfy $[\xi_i^a - \varepsilon_i^-, \xi_i^a + \varepsilon_i^+] = [\xi_i^s - \vartheta_i^-, \xi_i^s + \vartheta_i^+]$, such that the following velocity law of each moving agent holds,

$$\dot{\xi}_i^a(t) = \dot{\xi}_i^s(t) = -\rho_i k_i [x^2(t, \xi_i - \epsilon) - x^2(t, \xi_i + \epsilon)], (28)$$

with $\rho_i > 0, i = 1, 2, \dots, n$, are velocity gain of each agent. The guidance scheme for mobile agents enhances the controller performance in the sense that the state x converges to zero faster.

4. NUMERICAL RESULTS

In this section, a simulation example is illustrated here to show the effectiveness of our main results. Consider the distributed parameter system (1) with two mobile actuators and sensors in $\Omega = [0, 1]$.

The initial condition $x(0, \xi) = \sin(\pi\xi)e^{-9\xi^2}$ and initial boundary condition $x(t, 0) = x(t, 1) = 0$. The coefficient of transmission diffusion operator is $a = 0.0035$. Bounded nonlinear function $\phi(x(t, \xi), t, \xi) = 2\arctan(0.3x(t, \xi))$. The controller gain are $k_1 = 15, k_2 = 10$. The spatial distribution of actuators and sensors are given by (5) and (7), respectively. And, the time-varying centroid of i th agent is satisfies the case in Theorem 1 (iii).

As a comparison, we consider two fixed-in-space actuators which fixed at $\xi_1^a = 0.15, \xi_2^a = 0.85$ and two sensors which fixed at $\xi_1^s = 0.16, \xi_2^s = 0.16$. Figure 1 examines convergence of the state distribution when mobile networks are used. In the simulation, L_2 norm of the state for the closed loop system and the case of mobile networks are shown in Figure 2. The trajectory of two moving actuators and sensors are depicted in Figure 3 and the fixed case also in it.

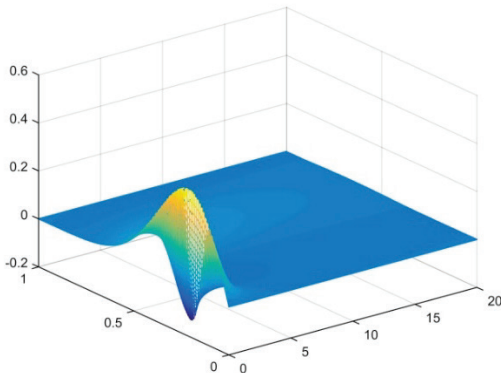


Figure 1. Mobile control of 1-D diffusion

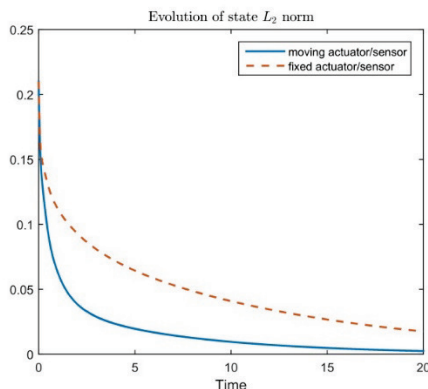


Figure 2. Evolution of state L_2 norm

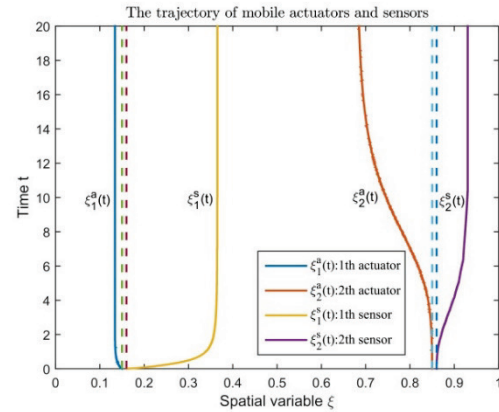


Figure 3. The trajectory of mobile actuators and sensors

5. CONCLUSIONS

In this paper, we have presented mobile actuator-sensor networks method for non-collocated control problem of an array of semilinear distributed parameter systems. The optimization proposal of stability analysis in diffusion processes has obtained by mobile agents. Several novel sufficient conditions that assure the globally asymptotically stable are derived. Moreover, the he velocity law of mobile actuators and sensors can be obtained. Finally, a numerical example has been given to support the effectiveness of the presented results. It should be mentioned that the obtained results improve and extend the earlier works.

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Topology Optimization Design of Lower Extremity Exoskeleton Based on Variable Density Method

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Abstract: In order to solve the problem of stroke patients walking obstacles, designed a new type of lower limb exoskeleton which can help patients with rehabilitation training, and based on the theory of variable density, introduced the SIMP interpolation function to punish the intermediate variables, the topological optimization of the main components of the exoskeleton was carried out. Refer to the topological analysis results, the second design and finite element analysis of the external skeleton were carried out, the results showed that the stiffness of the model was improved and the material usage was reduced by 12.16%. This method can help to realize the lightweight design of exoskeleton and provide an efficient and feasible method for the optimization of exoskeleton and other products.

Keywords: Rehabilitative Exoskeleton; Variable Density Method; SIMP Model; Topology Optimization

1. STRUCTURAL DESIGN

The development and research of rehabilitation exoskeleton has brought good information to paraplegia patients and based on the plasticity theory of the human brain, through continuous rehabilitation training, the adjacent brain areas that control the walking area of the brain are reshaped, and the patient can even restore the ability to walk independently.[1][2] Today many domestic and foreign research institutes and universities have developed rehabilitation exoskeletons with different functions and have achieved considerable results. With the upgrading of computer technology and the increasing maturity of finite element methods, structural optimization design has been widely used in automotive, aerospace, bridges and other fields. Japan's Yamaguchi and others

Table 1 Joint degrees of freedom and range of motion

Joint name	Degree of freedom	Sports form	Movement angle
hip joint	2	Flexion/extension	-15°—30°
		Internal rotation/external rotation	0°—10°
Knee joint	1	Flexion/extension	-50°—0°
ankle joint	1	Dorsal flexion / toe flexion	-15°—10°

Simplify the exoskeleton lower limb structure into a connecting rod system, and its kinematics model is shown in Figure 1. $O_0-X_0Y_0Z_0$ is based on the absolute coordinate system from the center of gravity to the lower limbs, L_1 , L_2 indicate the length of thigh and calf respectively, O_1 indicates the origin of hip joint coordinates, θ_1 indicates the

used topology optimization methods to rearrange the welding points of the car body, which not only improved the rigidity but also reduced the quality of the car body.[3] Yang Chen of Zhejiang University and others carried out a lightweight design of the cylinder block on the basis of the variable density method and finally determined the best shape of the cylinder block.[4] The topology optimization of mechanical products is also getting more and more attention from designers. Whether in the military industry or medical field, the research and development of exoskeleton is imperative, and the topology optimization of exoskeleton structure has gradually become a problem for designers to consider.[5] The basic conception of exoskeleton structure is based on the principle of bionics, which is a discipline that imitates the structure and function of organisms to create mechanical structures and develop new technologies. The basis of the exoskeleton designed in this article is the human lower limbs. We can know by querying the data of GB10000-88 "Chinese Adult Human Body Size" exoskeleton thigh structure size range is $L_1=400\text{mm}-530\text{mm}$, the size range of the calf structure is $L_2=300\text{mm}-420\text{mm}$, and the waist structure size range is $L_3=270\text{mm}-360\text{mm}$. The human body has 7 degrees of freedom in a single lower limb, but the movement in the sagittal plane is the main movement of the human body, and its rehabilitation training can involve almost all the lower limb muscles.[6] Therefore, the design of the exoskeleton single lower limb in this paper has 4 degrees of freedom. The degrees of freedom and motion range of each joint are shown in Table 1.

movement angle of the hip joint around the X_0 axis during training, θ_2 indicates the movement angle of the thigh in the sagittal plane during training, O_2 indicates the origin of the knee joint, θ_3 indicates the movement angle of the calf in the sagittal plane during training, O_3 indicates the origin of the ankle joint, θ_4 indicates the movement angle of the

ankle joint in the sagittal plane during training.

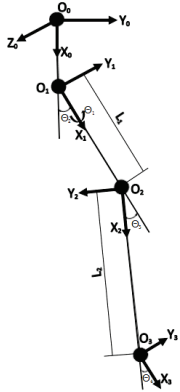
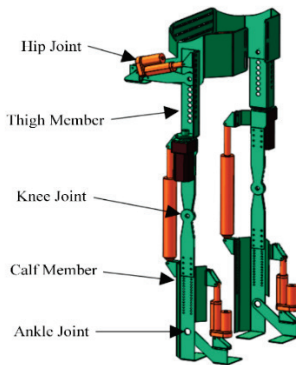
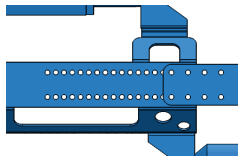


Figure 1. Kinematics model of exoskeleton single lower limb

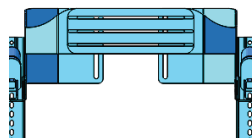
As shown in Figure 2(a), the overall structure of the exoskeleton is made of aluminum alloy with low density but high strength. In order to achieve the freedom of flexion and extension of the three joints of the lower limbs, the joints are designed as a four-bar mechanism instead of the traditional single-degree-of-freedom rotation mechanism. The joint drive adopts a linear motor with high controllability and stable motion; then add a pair of stepping motors at the hip joint to realize the degree of freedom of external rotation of the thigh and improve the flexibility of motion; the knee joint connection structure uses 4 layers of the same shape plate to realize the easy processing of the components; Figure 2 (b) and (c) The waist and leg adjustment device is displayed, which realizes the compatibility of the patient's body.



(a) The initial design and assembly of the exoskeleton



(b)Calf adjustment device



(c)Waist adjustment device

Figure 2. Exoskeleton structure design model

2. TOPOLOGY OPTIMIZATION OF EXOSKELETON

Topology optimization is divided into discrete body topology optimization and continuum topology optimization. Under the conditions of satisfying the established constraints, the best material layout scheme can be obtained, [7] which can improve the rigidity of the product and increase the material utilization rate to a certain extent. Structural topology optimization is mainly applied to the conceptual design level with more design

freedom. The designer can perform secondary design on the product according to the topology optimization results and the actual processing conditions to obtain the best model of the exoskeleton.

2.1 Variable density method

At present, the variable density method in the theory of topology optimization method is widely used in a variety of commercial software due to its single design variable and simple and efficient solution process. The idea is to assume a material with an unfixed density, discretize the continuum structure into a finite number of cells, and artificially determine the relationship between the relative density of the cells and the material properties. In the mathematical model, 0-1 discrete variables are used to represent the removal and retention of structural unit materials, and the material interpolation function model is introduced to transform the discrete density value problem into a continuous density value optimization problem in the 0-1 interval, so that the optimization becomes Differentiable. If the element variables move closer to 0, the final model will appear as a hole, otherwise it will appear as a solid [8]. After several iterative calculations, the final structure appears as the best transmission path of the load, and the topology optimization of the structure is completed.

2.2 Build a mathematical model

The commonly used material interpolation model for variable density method is Solid Isotropic Material with Penalization and Rational Approximation of Material Properties. In order to avoid the checkerboard phenomenon, both of them introduce a penalty factor to punish the relative density intermediate variable to move closer to the two ends. The study found that in most optimization processes, the results of the two are almost the same. Therefore, this paper selects one of them, namely the SIMP interpolation model, for calculation. In the SIMP interpolation model, the relationship between relative density and elastic modulus can be expressed by the following formula.

$$\begin{cases} E = \rho^p E_0 \\ \eta = \eta_0 \end{cases} \quad (1)$$

In the formula, E represents the elastic modulus, η represents Poisson's ratio, ρ represents the relative density of the unit, p represents the penalty factor, E_0 and η_0 are the actual material elastic modulus and Poisson's ratio. The selection of the penalty factor is related to the convergence of the function and the result of topology optimization. In order to select the appropriate value of the penalty factor, this paper selects $p=1, 2, 3, 4, 5, 6, 9$ values to draw the function curve in the B environment.[9] As shown in Figure3, when the penalty factor is selected from 2 to 6, it is reasonable to choose a penalty factor value of 3.

The ultimate goal of exoskeleton optimization is to reduce the amount of material used while ensuring the optimal stiffness. In the design of this paper, the objective function is set to maximize the structural stiffness, the constraint condition is the volume ratio before and after optimization, and the design variable is the relative density of each

International Journal of Computational and Engineering structural unit. In order to facilitate the establishment of the mathematical model, this paper converts the maximum structural stiffness into the minimum deformation energy[10], and the finalized model is:

$$\begin{aligned} \text{Find} \quad & \rho = [\rho_1, \rho_2 \dots \rho_n]^T \\ \text{Min} \quad & C(\rho) = U^T K U = \sum_{i=1}^n (\rho_i)^p u_i^T k_0 u_i \\ \text{s.t.} \quad & V = \sum_{i=1}^n \rho_i v_i \leq f V_0 \\ & F = K U \\ & 0 \leq \rho_{\min} \leq \rho_i \leq 1 \end{aligned} \quad (2)$$

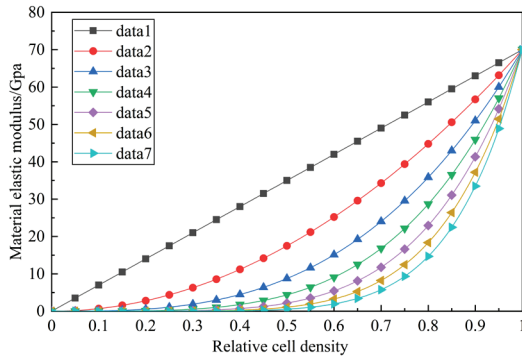


Figure 3. SIMP density function model

In the formula, ρ_i represents the relative density of structural elements, K and U represent stiffness matrix and displacement vector respectively, u_i is element displacement vector, product F represents external force vector, V_0 represents design space volume, f represents optimized volume ratio, and the value here is 0.6, V represents the final structure volume. In order to avoid the singularity of the total stiffness matrix, the material at the hole is replaced with a very small density value of 0.001.

2.3 Exoskeleton optimization

Establish the Shape Optimization topology optimization design item in ANSYS and import the thigh member model, and define the material as aluminum alloy. order to make the calculation results more accurate and the reasonable assembly of the components, the grid size of the optimization area is set to 5mm, and other areas are the default, and the push rod base will not be included in the optimization area. When the linear motor is installed at the uppermost end of the thigh member, the member is in the working condition of maximum force, and reasonable load and restraint are applied according to the actual working condition [11]. The results of the exoskeleton meshing and the concrete application form of loads and constraints are shown in Figure 4.

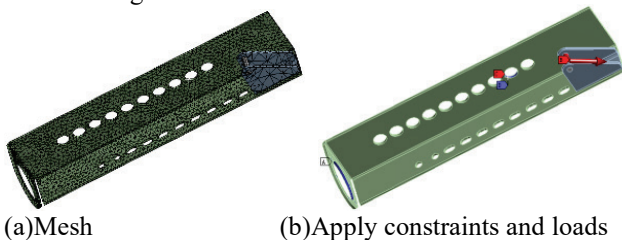


Figure 4. Pre-processing of thigh component topology optimization

After the pre-processing of the model is over, click Solve

to solve it and converge after 23 iterations. The topology optimization structure with pseudo density between 0.5-1 is shown in Figure 5.

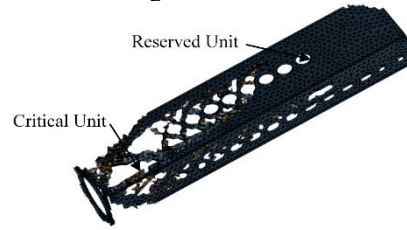


Figure 5. Topological retained material diagram of the thigh member

Comprehensive consideration of the aesthetics and ease of processing of the components, the secondary design of the thigh components is carried out. Compared with the original model, the holes of the thigh components installed as the push rod base and the cylindrical pin need to be completely retained before the optimization; the original model surface is opened to different degrees. Hole, remove the solid material, in order to prevent stress concentration, the opening part is excessively rounded; when the linear motor is located at the bottom of the hole, the entity around the hole must bear the thrust load, therefore, the connecting rib is designed here to connect it Connect the bottom of the thigh. The optimized model is shown in Figure 6.

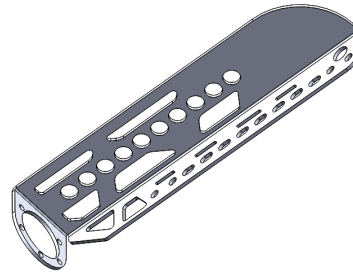
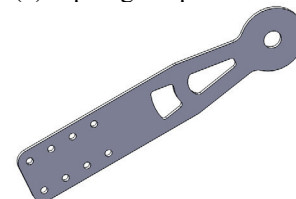


Figure 6. Optimized thigh component model

The same process is used to optimize the topology of the calf component. The optimization result and the final model are shown in Figure 7.



(a)Topological preservation material picture

(b)Optimized model picture

Figure 7. Optimization of calf components

3. FINITE ELEMENT ANALYSIS

The thigh and calf components before and after the optimization are respectively analyzed statically. The static analysis can obtain the maximum stress and strain of the component under the ultimate working load, and the

structural rigidity and optimization effect can be verified through the analysis results. The finite element analysis cloud diagram is shown in Figure 8 and Figure 9, and the

relevant parameters and comparison of each component before and after optimization are shown in Table 2.

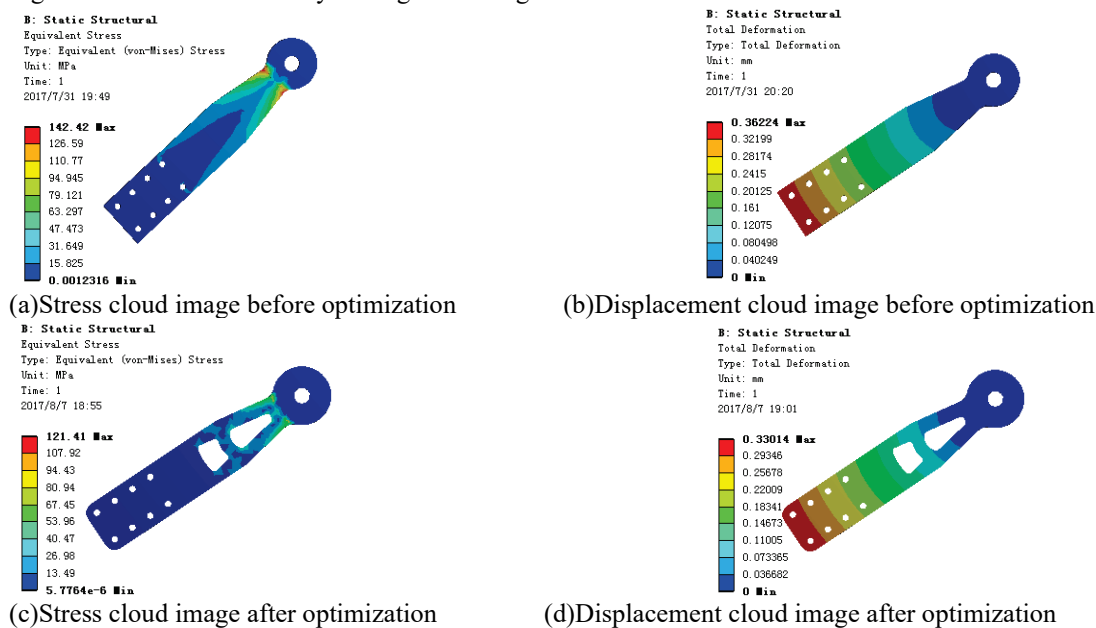
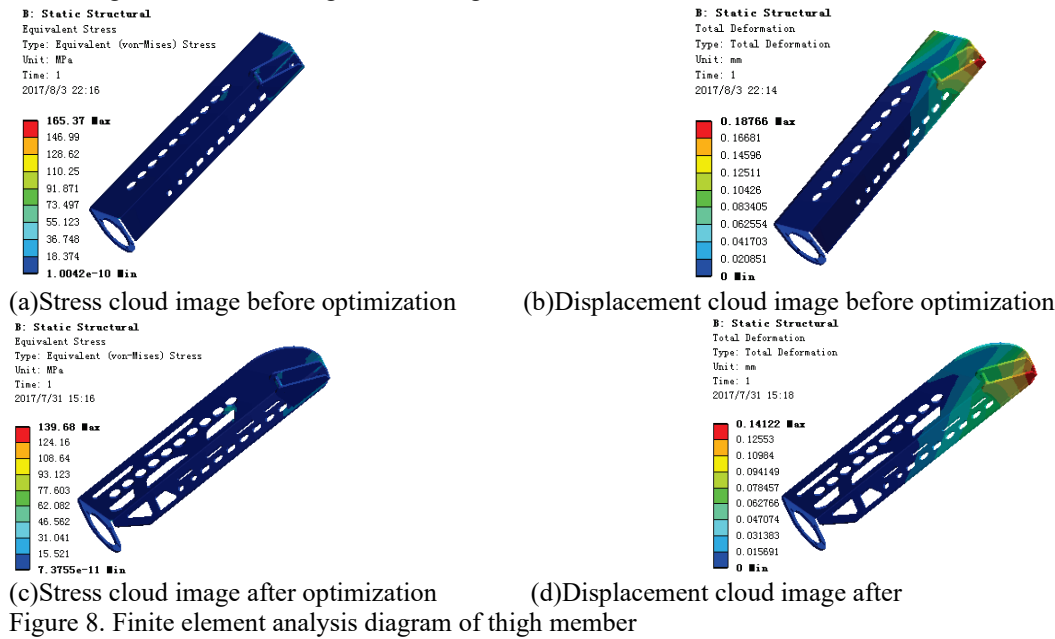


Table 2 Comparison of analysis results before and after optimization

Parameter	Thigh member		Calf member	
	Before optimization	Optimized	Before optimization	Optimized
Maximum stress /Mpa	165	140	142	121
Maximum displacement/mm	0.19	0.14	0.36	0.33
Mass/kg	0.88	0.76	0.28	0.25

From the analysis results of Table 2, it can be seen that the parameters such as the maximum stress, maximum displacement and mass of the optimized components have all decreased, and the analysis results are consistent with expectations. Perform appropriate opening operations on the exoskeleton waist belt and the ankle joint motor base

and other structures that bear less load, and the optimized components are reassembled on the whole machine, and the final exoskeleton model is shown in Figure 10.

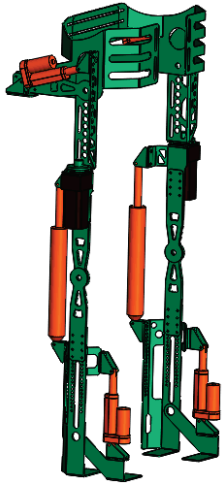


Figure 10. The final model of the exoskeleton

Compared with the model before optimization, the model after optimization has been punched to remove entities in the main components based on the optimization results. Open the exoskeleton model before and after optimization in SolidWorks and define the material properties of the corresponding components. The total mass of the model can be viewed in the evaluation column. According to the analysis, the total mass of the exoskeleton during the conceptual design period was 15.21 kg, and the total mass of the exoskeleton after optimization and secondary design was 13.36 kg, and the material saving rate reached 12.16%.

4. EXOSKELETON PROTOTYPE

After completing the reasonable optimization design and the finite element analysis of the exoskeleton model, the exoskeleton base parts are manufactured according to the part drawings and processed according to the bending process of the structural design, and the exoskeleton prototype is finally completed. The physical prototype of the exoskeleton is shown in Figure 11.

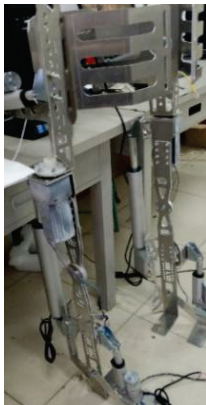


Figure 11. Exoskeleton physical prototype

5. CONCLUDES

In this paper, based on the theory of the variable density method, external skeletal completed topology optimization design and finite element analysis, finally in the case of reduce stress deformation of the structure, designed a structural material layout is reasonable, suitable for different people wear the new rehabilitation training

exoskeletons and prototyping, materials saving rate of 12.16%, in the whole quantitative production, will greatly reduce the production cost, improve the utilization rate of resources, and other products for the exoskeleton robot light weighting design provides a feasible method.

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A Review of Mast Cell-Related Neuropathic Pain in Alzheimer's Disease

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Abstract: Neuropathic pain (NP) derived from neurodegenerative disorders has gained increasing interests recently. As a typical kind of neurodegenerative disease, Alzheimer's Disease (AD) is reported to have the feature of NP. Currently, it is considered that NP is closely related to the neuroinflammation, during which mast cells (MCs) are considered the essential responders and are able to initiate and augment immune responses in AD. Interactions between MCs and microglia, astrocytes, and neurons can induce and magnify NP through releasing allogenic substances like inflammatory factors, chemokines, cytokines and histamine. Furthermore, external and macro factors like injury and stress can accelerate the process of NP. Summarizing available researches in this field, we aim to elucidate the involvement of MCs with glial cells, neurons, and high-level factors, and to provide a new insight into MC-related NP in AD.

Keywords: Neuropathic pain, Mast cell, Alzheimer's Disease

1. INTRODUCTION

Neuropathic pain (NP) stemming from injury to the peripheral or the central nervous system (CNS) is a persistent and intractable type of chronic pain described as stabbing, burning, and electrical[1]. Due to the lack of effective means of control, NP has placed a considerable burden on both individuals and society. It has been considered that the generation and amplification of NP are involved with a variety of neuroimmune processes, in which many immune cells such as mast cells (MCs) participate[2]. Facilitated by their close proximity to nerve fibers in the periphery and meninges of the spinal cord and the brain, MCs located in the CNS play a critical role in neuroinflammation and thus neuropathic pain[3]. Interacting with various molecules or cells, MCs have been found to release active mediators, primarily histamine and serotonin on degranulation in response to different stimuli including chemical, nerve damage, toxin or disease-related conditions[4].

Alzheimer's disease (AD) is an irreversible neurodegenerative disease, clinically characterized by progressive impairments of memory and cognition[5]. In past decades, researchers placed greater focus on the cognitive and behavioral disorders of AD patients and created many treatments and drugs to improve the clinical manifestations of dementia. With the growing demand for enhancing the quality of life, neuropathic pain concomitant with AD has gradually gained increased attention.

Currently, a number of experiments have proved directly or indirectly that MCs occupies an important position during the development of neuropathic pain mediated by neuroimmune mechanisms [6]. However, pertinent reviews to summarize and sort the mast cell-related NP in Alzheimer's disease are lacking. In this brief review, we summarized the best available knowledge on AD-related neuropathic pain from mast cell-glial cell interaction, mast cell-neuron interaction, and high-level factors. Furthermore, we discussed the limitations of existing studies and offered some recommendations for future research.

2. NEUROPATHIC PAIN DERIVED FROM MAST CELL-GLIAL CELL INTERACTION

The impact of neuropathic pain relating to MC-glial cell interaction has been well researched. Across all relevant glial cells, microglia and astrocytes are mostly studied[7]. With regard to mast cell-microglia interactions, many *in vitro* researches have revealed the origin of NP from molecular pathways mediated by inflammatory factors. Under neuroinflammation processes involved in AD, it is accepted that mast cells can release histamine to activate microglia through histamine receptors H1 and H4. And activated microglia secrete subsequently neurotoxic substances such as TNF- α , IL-6 and IL-1 β [8], which have been proved to serve as allogenic substances through mechanisms of nociceptive neuron sensitization or algesioreceptor-ligand combination[9]. Due to brain mast cells are characterized of a tryptase-chymase positive phenotype[7], a few studies have established the relationship between mast cell tryptase and proteinase-activated receptor. In AD-related neuroinflammation, mast cells can release granules containing tryptase[9]. The tryptase can activate proteinase-activated receptor 2 (PAR2) receptors on microglia, leading to chronic pain through the secretion of allogenic substances such as TNF- α , IL-6, and reactive oxygen species (ROS)[7]. Bidirectionally, IL-6 and TNF- α are reported to affect the expression of toll-like receptor and proteinase-activated receptor, which is likely to influence the effect of mast cell activation and degranulation[10]. Apart from classical factors mediating interactions between microglia and mast cell, more and more attention has been paid to molecules discovered recently, such as glia maturation factor (GMF), a kind of intracellular proinflammatory protein associated with the pathogenesis of AD[11]. On the one hand, microglia can release GMF to stimulate the activation of mouse and human mast cells, secreting some specific proteases and other neuroinflammatory mediators

implicated in the generation of neuropathic pain. On the other hand, mast cells have been demonstrated to be capable of expressing GMF, which can induce microglia to release IL-1, further causing the neuropathic pain as a kind of inflammatory factor[12]. Additionally, some chemokines, receptors and other bioactive molecules participate in the regulation of neuroinflammation in AD, including the complement component 5a receptor (C5aR), C-X-C chemokine receptor type 4 (CXCR4) and C-C ligand type 5 (CCL-5)[13]. By alleviating or suppressing inflammatory reaction, these factors can take effect in the neuropathic pain derived from mast cell-microglia interaction.

In terms of the neuropathic pain mediated by mast cell-astrocyte interaction, many studies have provided *in vitro* evidence in AD. Structurally speaking, mast cells and astrocytes share perivascular localization in brain[14], based on which researchers mimic the pathological conditions of AD to culture these two kinds of cells together, with a view to explore the relationship functionally. The result showed that several inflammatory mediators including histamine were released upon co-cultivation, playing roles directly in the generation of NP[9]. Like microglia, astrocyte also expresses histamine receptors[7], which suggests that NP can be induced in a similar way. As an important kind of pain-causing substances, substance P (SP) is found to initiate NP in neurodegenerative diseases. IL-33 secreted by astrocytes can increase the expression of SP[15]. And by activating MCs, SP lead to the release of a series of inflammatory mediators, which can serve as algogenic factors. Additionally, the bidirectional promotion of astrocytes and MCs can produce cytokines and chemokines causing neuropathic pain of AD, such as IL-6, TNF- α , monocyte chemotactic protein 1 (MCP-1), and CCL-5[16], which is similar to what tends to occur in mast cell-microglial

interaction. The studies mentioned above have stressed on the bidirectional communication between MCs and glial cells, elucidating an essential mechanism of NP generation.

3. NEUROPATHIC PAIN DERIVED FROM MAST CELL-NEURON INTERACTION

Compared with MC-glial cell interaction, the impact of neuropathic pain in AD related to mast cell-neuron interaction has not been well studied. It is mainly ascribed to the fact that the functional interaction between mast cells and neurons *in vivo* is not yet well characterized[17]. However, there have been *in vitro* experiments demonstrated the correlation. According to a study realized by Hagiya, M. et al., there exists cell adhesion molecule-1 (CADM1) mediating the adhesion and communication between sensory neurons and MCs[18]. This finding of the co-localization of neurons and MCs is suggestive of neuro-immune interactions, which potentially induce the neuropathic pain. Functionally, Purcell and Atterwill have proved that MCs are similar to neurons in many respects. Especially with regard to synthesis of neurotrophic factors, and responsiveness to neuropeptides and dopamine, MCs and neurons are considered to have a strong connection due to similarities[19].

From the perspective of pathogenesis of AD, a few studies have revealed the association between A β peptides and mast cells. As these studies reported, MCs are thought as one of the first brain cells that detect and respond to A β formation in the pathogenesis of AD[9]. In the progression of AD pathology, MCs specifically identify A β peptides and are activated to release inflammatory factors that are implicated in neuropathic pain generation[20]. Moreover, the process of A β aggregation can be induced by elevated intracellular concentration of calcium, and thus lead to hyperalgesia and allodynia, serving as a significant mechanism in NP induction[21].

Table 1. NP-related interactions between MCs and other cells of the CNS.

Interaction Type	NP-related Pathway	Algogenic factors	References
MC-microglia interaction	Histamine released from MCs activates microglia through ligand-receptor recognition	IL-1 β , TNF- α , IL-6, histamine	[8,9]
	Tryptase released from MCs activates microglia through PAR2	TNF- α , IL-6, ROS	[7,9]
	TNF- α and IL-6 regulate the expression of TLR and PAR	Inflammatory factors	[10]
	GMF expressed by MCs induces microglia' secretion	IL-1	[12]
	GMF expressed by microglia induces MCs' secretion	Inflammatory factors, protease	[12]
	MCs & microglia communicate bidirectionally	Chemokines, cytokines	[13]
MC-astrocyte interaction	Histamine released from MCs activates astrocytes through ligand-receptor recognition	IL-1 β , TNF- α , IL-6, histamine	[9]
	IL-33 expressed by astrocytes induces SP-mediated MCs' release	IL-33, SP	[15]
	MCs & astrocytes communicate bidirectionally	MCP-1, CCL-5, IL-6, TNF- α	[16]
MC-neuron interaction	MCs activate through identifying A β peptides and ROS secreted by neurons	Inflammatory factors, calcium	[20,21,22]
	MCs & neurons communicate bidirectionally	SP, NT, NGF, MCP-1, CCL-5, IL-8	[23]
	MCs insert products into neurons to regulate microenvironments	Inflammatory factors, neuropeptides, dopamine	[24]

Similar to A β peptides' effect, increased levels of ROS in AD can also activate MCs to release inflammatory

mediators[22], which are proved as algogenic substances to conduct neuropathic pain. In addition, the shared

commonalities of MCs and neurons have provided a basis for interrogating neuron-secreted substances to explore their association. Kulka et al. have found that neuropeptides released from neurites, such as SP, neurotensin (NT) and nerve growth factor (NGF), can bind to and activate MCs either by G-protein dependent pathways[23]. SP can also induce degranulation and release of cytokines and chemokines, such as MCP-1, IL-8 and CCL-5[23], which have direct algogenic effects to mediate NP. In particular, there is a process termed transgranulation involved in NP in CNS neurons. It means the fact that MC-derived products can enter adjacent neurons and insert their granule contents. Through such a way, MCs can alter the intracellular environment of neurons, suggesting that the transgranulation process may affect immunology factors secretion and further regulate the neuropathic pain[24]. Previous studies mentioned above discussed the neuropathic pain in AD with an eye on interactions between neuron and mast cell, which is complementary to MC-glial cell interaction.

4.MC-RELATED NEUROPATHIC PAIN AFFECTED BY HIGH-LEVEL FACTORS

Systematically, the pathogenic process of AD can be influenced by externality. Many high-level factors, macro and external, can initiate or magnify the neuroinflammation in AD. Accordingly, MCs are potential to respond to these factors and induce neuropathic pain. Several lines of evidence indicates that mast cell activation could accelerate the progression of AD pathology in high-risk group patients with brain injury, trauma, stress conditions and so on[25].

It has been already reported that IL-33 can be released upon injury[26]. Confirmed as an alarming cytokine, IL-33 can stimulate MCs and microglia to alert the innate immune system, which result in a substantial amount of cell proliferation and synthesis of algogenic mediators such as IL-6, IL-8, and IL-13[16]. From an inflammatory point of view, mediators released from the activated MCs are able to increase the vascular permeability and the expression of integrins, facilitating inflammatory cells to migrate to the site of injury[27]. Then like typical neuroinflammation process associated with NP, the inflammatory reactions are initiated or enlarged.

In terms of stress condition, previous researchers have found that the release of corticotropin-releasing hormone (CRH), a key factor in physiological adaptation under stress, have impact on MCs to conduct the progression of AD[28]. The accomplishment of this role relies on mast cell-glia interaction and mast cell-neuron interaction, which are mediated by numerous neuroinflammatory factors including cytokines, chemokines, and other neurotoxic mediators such as tryptase, histamine, IL-1 β , TNF- α , IL-6, CCL-2, IL-8, ROS, and matrix metalloproteinases (MMPs)[29]. These factors are related to the origin of neuropathic pain directly. Also, stress increases blood brain barrier (BBB) permeability and recruits more immune and inflammatory cells including mast cells, which tends to magnify neuropathic pain in turn[12]. In summary, various conditions including stress conditions and injury may induce or augment

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neuroinflammation in AD pathogenesis, which directly influence the generation and amplification of neuropathic pain.

5.DISCUSSION

An obvious limitation of past researches is the experiment method selection. Among all the primary studies cited in this review, *in vitro* assays or additional experiments in animals are mostly carried out. While the most persuasive approach of randomized controlled human trials is rarely used. This could be due to the fact that there was insufficient evidence to clarify MC-related NP in AD, which did not fulfill the ethical requirement of human experimentation. Despite the lack of high-quality evidence, from available data we can construct a simple network to describe the association between MCs and NP. We believe that to conduct *in vivo* experiments in animals and further to link results with clinical data will make us gain more insight into this field. Secondly, there is deficiency in previous pharmacological experiments. For signal transduction pathways of mast cell-glial cell interaction and mast cell-neuron interaction, many attractive targets have not been designed to receive intervention yet. Therefore, it is feasible to intervene positively in neuropathic pain generation mechanisms in future research, which is also essential for the development of new drugs.

6.CONCLUDING REMARKS

Mast cell activation is implicated in the generation and augmentation of neuropathic pain. Mediated by neuroinflammation, the induction of mast cell-related neuropathic pain in AD have many pathways in different kinds of mechanisms. In mast cell-glial cell interaction and mast cell-neuron interaction, various inflammatory factors can act bidirectionally to initiate and magnify nociceptive signals. Some specific substances like A β peptides, ROS and particular processes like transgranulation activate MCs and induce neuropathic pain via ligand-receptor binding of nociception and receptor sensitization as well. Furthermore, these effects can be facilitated and amplified in conditions of brain injury and stress. In all, the aim of this field is ought to inhibit the pathogenesis and alleviate the neuropathic pain of AD. It could be explored as a new direction to select appropriate targets of mast cell-associated inflammatory pathways and perform therapeutic interventions. Though the relevant evidence is currently limited, interrogating the role of mast cell-related neuropathic pain is a meaningful work to understand and treat neuroinflammatory disorders including AD.

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Rococo Legacy in Furniture Design During Art Nouveau Movement

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Abstract: The inspiration and elements of furniture design in the new art period mostly come from the use of Rococo style curve style and natural elements. It is a design method for artists and designers to learn from the elements of historical tradition to combat the roughness and aesthetic deficiency of industrialized furniture. At the same time, the furniture design in this period not only stays in the inheritance and reference of Rococo style, but also focuses on its transformation and promotion, trying to find a new and more suitable form of furniture design.

Key words: Art Nouveau Furniture Design; Rococo Style; Reference; Transformation

1. ART NOUVEAU MOVEMENT AND ROCOCO STYLE

At the end of the 19th century, the Art Nouveau movement was regarded by some theorists as a "conscious return to the European romantic artistic tradition". This is mainly due to the fact that many works in the design field during the Art Nouveau movement tried to draw on the design elements and design forms from the traditional Baroque and Rococo styles, so as to combat the problems of the current industrial design products' rough manufacture and lack of aesthetic taste. At the same time, the Art Nouveau movement has also been contradicted and criticized. British critic ERD Duncan once wrote: "the chaos in the field of art and design has swept through France, Germany, Austria and Italy. In this kind of art practice known as the new art movement, metal materials are designed into interesting and unnatural shapes; the chair looks like a rough and embarrassing stump; the box can use countless ropes Around it..." Although Duncan made the above description in a negative tone, he pointed out some essential features and design styles of furniture design in the new art period, such as the use of curves and the imitation of natural modeling. The conscious return to the traditional style reflects the colorful and complicated artistic style of the new art movement at that time to a certain extent.

(1) Art Nouveau

The so-called "new art" in the history of Western art is Art Nouveau. This is a proper noun. It is a French word. Strictly speaking, "Art Nouveau" movement is a nonstandard name. It refers to a kind of art design trend of thought and general fashion of art practice which rose in the West more than 100 years ago. It is also an important turning point in the history of Western arts and crafts, and a great development of Arts and crafts in Europe. Compared with other art styles in history, although the new art movement is "new", it does not exclude the

reference to the traditional art style, such as the Rococo style. The achievements of Rococo style in decorative art have greatly inspired and influenced the concept and practice of Art Nouveau, especially for furniture works with new art style.

(2) Rococo style

Rococo art is a kind of art form or artistic style, which was produced in France in the 18th century and widely used in interior decoration and home design. Rococo style pursues delicacy and elegance with exquisite details, and is keen on pursuing asymmetric composition. Its craft, structure and lines have the characteristics of mildness and softness. Its decorative theme has a naturalistic tendency. It is good at using rich and changeable curves and asymmetric and unbalanced forms to carry out decoration composition design, giving people a strong dynamic visual impact and pride Gorgeous impression. It is particularly worth mentioning that the form of furniture is completely consistent with the decoration of interior furnishings and interior walls, forming a complete new concept of interior design. The furniture of this period is usually decorated with beautiful curve frame, brocade, precious wood patches and gilded surface, which not only forms an extremely luxurious overall feeling in vision, but also achieves an unprecedented degree of perfection in practical and decorative effect. The artistic style of this period provided an important ideological source for the development of the art movement. The furniture design in the period of Art Nouveau movement obtained many design elements and inspiration to realize the exploration of new furniture form.

2. INHERITANCE AND REFERENCE OF ROCOCO STYLE IN ART NOUVEAU FURNITURE DESIGN

(1) Curvy style

One of the sources of Rococo's new art design ideas is Rococo's new art style. Rococo was mainly popular in the 18th century of Louis XV. At the end of the 19th century, under the background of the beginning of modernity, art designers made a new interpretation of the patterns of animals and plants, such as curve, asymmetry and vortex, which were emphasized by Rococo style. The spirit of new art advocates imitating nature, using highly refined, organized and structured natural elements such as plants and insects to express the vitality of the natural world and the creative energy of humanistic spirit. The furniture works in the new art period widely used the curve form, saying goodbye to the rigid and simple straight line. The most important characteristics of organic materials and curvilinear means are full of vitality and flowing charm. In this regard, new art and Rococo have the same

wonderful, the latter also emphasizes the use of a large number of lively patterns, including curve body, spiral shape, swirl pattern, wavy and so on. These make art nouveau furniture and Rococo furniture both have a soft melody and a distinct sense of movement, there is a clear style of kinship between the two.

Rococo decorative style often uses asymmetric techniques, especially the use of arcs and curves in design works. Rococo period furniture design works are also known for their asymmetric light and slender curve style. This period of furniture design has become an unprecedented prosperity with a historical landmark form of existence. After that, with the development of industrial revolution, the number of furniture produced in industrial batch increased. Because of the batch limitation of production technology, the industrial furniture products abandoned the various decorative forms, and the furniture presented the situation of "thousands of people face each other". This is what the artists and designers in the new art period can't tolerate, so the artists in various European countries began to reflect, trying to seek design elements from the traditional decorative style to apply to the furniture design at that time, in order to fight against the roughness and repeatability of large industry. Rococo style is the most used style at that time, and its representative curve elements also frequently appear in the furniture design of the new art period.

In this period, the details of furniture design have obvious classical style, such as the combination of curve and straight line, the application of curve pattern in furniture, and the characteristics of furniture materials, such as the bending and stretching process of wood through high temperature steam, all make the furniture design of this period present a sense of getting rid of industrialization and having classical decorative aesthetic meaning. For example, in 1899, a dressing table designed by the Belgian designer seruai bove put special emphasis on the aesthetic consideration of the curve in the whole modeling. The whole modeling of the dressing table mostly uses the bending of wood to form an arc, and the arc at the top of the mirror and the arc at the top of the leg form a harmonious echo. Many of the furniture works of Calais, a representative of the Nanxi school in the same period, also strive to seek new significance in the use of curves. The glass cabinet designed by him adopts a large number of curly curvilinear shapes and plant patterns, which reflects the designer's extremely high artistic techniques and ideas, and also reflects the inheritance and reference of the 18th century Rococo style decorative elements.

(2) Naturalism

The use of many natural elements in Art Nouveau furniture is exactly inherited from the Rococo style. Wilde, an aesthete, once described the imagination of naturalism in the new art style: "all the flowers on the grassland should be allowed to surround your pillow with their branches, so that every small leaf in your huge forest can provide their shapes as patterns, so that the wild rose and its curly branches will live forever in the carved arches, windows and marble On

In this period, designers began to use a large number of

natural plant modeling as the prototype reference and detail decoration of furniture design. The mellow details and plant patterns are still a reflection of Rococo style. Before that, William Morris, an outstanding representative of the arts and crafts movement, put forward the slogan of "learning from nature". The following trend of Art Nouveau decoration clearly stated in the Declaration: "our roots are in the secluded forest, on the side of the spring, on the moss". Furniture designers try to use the Rococo style to resist the rough industrialization and the lack of aesthetic taste.

French designer Gaillard designed and produced the chair around 1905. The decorative patterns on the top absorbed the asymmetric elements of the Rococo period furniture design style. The leather of the back was printed with plant flowers and leaves with rough lines, and the leather and walnut frame were connected by copper rivets. The feature of this work is that there is no armrest. The back is connected with the first two of the four legs in an arc transition. The end of the leg is treated as a square animal claw shape, corresponding to the plant patterns on the back, so that the two life forms of animals and plants are integrated. Art Nouveau designers try to save the innocent and pure taste of life by cherishing nature. Through careful observation, bold creativity and meticulous conception, they introduce natural elements into various furniture designs and decorate people's daily life through artistic abstract ways.

Artists and designers engaged in the Art Nouveau movement, in an era of old things residue and new things sprout, strive to call for the emergence of new design forms, but also have a liberal and open attitude towards the past history. They can realize the necessity of extracting the elements they need from the history resources, so the furniture design of this period is very important. Most of the products present a trend of revivalism with rococo legacy.

3. IMPROVEMENT OF ROCOCO STYLE IN ART NOUVEAU FURNITURE DESIGN

The transformation of Rococo art by Art Nouveau is also obvious: in order to resist the rigid purely realistic and naturalistic decoration, artists and designers of new art style pay more attention to the creation and use of pure image elements in addition to realism. The natural motif of realism is transformed into a free means to express its decorative concept. The deformed plants, overlapping branches and leaves, and winding vines all make the furniture full of tension and vitality. Art Nouveau movement is not only a relive of the old dream of Rococo style, but also a transformation and improvement of Rococo art under more developed social conditions.

The furniture design in the new art period is not only satisfied with inheriting and borrowing elements from the traditional Rococo style, but also trying to find out how to combine the retro elements with the current aesthetic needs of the people. They try to express modern consciousness with historical elements and speculate about the possible design styles in the future. Van der veld, a Belgian decorative artist, is one of the artists who are trying to explore in this field. He advocated that the

principles of deconstruction and functional attention should be adhered to in furniture design, and the attached decoration should be reduced as much as possible. In fact, his ideas are very close to some demands of modernism design principles. The only difference is that modern design is aimed at the common people's aesthetic design demands, while Verde still emphasizes the aesthetic service for people above the middle class. His furniture works generally have round curve modeling and smooth streamline structure, still flowing with the legacy of Rococo style, but compared with them, they have a great transformation of rich rationalism. The oak bedstead, designed in 1899, is generally more natural and even slightly rough, but the round and delicate arc outside indicates that the work has been carefully designed. He expressed his appreciation for the new art learning from the traditional style of Rococo and personally practiced it, but at the same time he tried to get rid of the shackles of natural elements on the new art thought.

During this period, the "new" artists and "new" designers of different countries, while looking back at the history, are trying to seek and explore the possible furniture styles in the future. While inheriting and drawing lessons from Rococo style, it also emphasizes the practicality of design and the simplification of decoration. For example, German designer Berens designed the oak round table in 1900. It is vertically divided into six parts from top to bottom, and its top table, middle support and bottom panel are all connected and assembled by six parts. The support in the middle is like a vase in the shape of an urn, and the six curved scrolls around it hold up the tabletop. The overall shape is simple and unified, which has the aesthetic style of modernism design and the aesthetic meaning of classical decoration. It is one of the representative works of furniture design in the new art period, which is trying to transform and explore while learning from the classical Rococo style. At the same time, a series of works designed by the members of Austrian

Separatists were also trying to transform the furniture design with classical decorative aesthetic significance, and a number of furniture design forms with the budding of modern design appeared. These furniture designs are focused on the organic nature of the natural elements of the traditional Rococo style emphasized by the new art, through simplifying the decoration, focusing on showing the aesthetic value of furniture raw materials to realize the exploration of new forms of design, which is the promotion and transformation of the Rococo style.

Epilogue

Art Nouveau furniture design is a great march with idealism color to explore the unknown life style at that time. His conscious return to the Rococo style carries the memory and review of the historical style, so that those faces and pictures which are slightly dim with the passing of time will be suffused with brilliance again, showing people's recognition and nostalgia for the past historical life style. The innovation and transformation of furniture design also tells people's conjecture and unremitting exploration of scientific achievements and future life style. The continuous review and exploration practice of Rococo style in Art Nouveau furniture design is not limited to the narrow concept of decoration field or art world, but is further regarded as a unique representation of human modern civilization.

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Research on the Training Ways of Practical Operation Ability of Accounting Major Students in Colleges and Universities

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Abstract: Accounting major is involved in the calculation of enterprise financial statements and financial statements, as well as the study of the assets and income of enterprises in the business cycle. As the accounting profession requires highly professional ability and quality of accountants, colleges and universities need to train students' professional quality and practical operation ability when cultivating students majoring in accounting. However, in the traditional teaching process, there are many problems in Colleges and universities, such as the lack of teachers, the outdated teaching evaluation system and the lack of practical operation courses. These problems lead to the weak practical ability of accounting students. Therefore, colleges and universities need to find appropriate measures to deal with these problems and solve them timely and effectively, so as to ensure that accounting students not only have achievements in academic ability, but also have certain experience in practical operation, so as to provide guarantee for their future work. This paper starts with the reasons for the lack of practical ability of accounting students in Colleges and universities, and discusses the ways to cultivate the practical ability of accounting students.

keyword: College; Accounting Major; Practical Operation; Way

1. CONTENT OF PROFESSIONAL ABILITY OF ACCOUNTING STUDENTS

In 2014, the State Council put forward the training policy and plan for accounting students in Colleges and universities for the accounting industry. The plan clearly proposed that accounting students should be trained into professional talents with excellent professional quality and practical operation ability. Accounting practice is one of the most important standards in accounting teaching. Therefore, in the teaching process of colleges and universities, the cultivation of students' practical ability should run through the whole process of teaching, and the practical ability and theoretical teaching should be put in the common important position.

In recent years, with the rapid development of economy, under the new normal of economy, the state has issued new requirements for accounting major, and has planned in detail the three abilities that accounting students must possess. The first ability is the qualification of accounting students. Because the accounting industry needs practitioners to have the corresponding professional ability and qualification certificate, the professional qualification certificate is also the guarantee of accounting

students' professional ability [1]. The second ability is the professional quality of accounting students, accounting students not only need to have excellent professional ability, so that they can ensure the completion of enterprise financial related work in the future work. In addition, more important than professional ability is the professional quality students need to have. In recent years, the criminal cases committed by financial personnel of some enterprises are endless, which is the reflection of the lack of relevant professional quality of accounting personnel. Therefore, relevant colleges and universities should pay attention to the cultivation of students' professional quality, so that they can abide by the relevant rules and ensure the integrity of work. In addition, another ability is the management ability of accounting students, accounting students not only need to have the corresponding professional ability and professionalism, but also need to have a certain management ability, because accounting work in the long-term work process, will face complex work content and need to be treated strictly data, and for the future career planning students should also have the ability. Certain management ability. Therefore, the school should cultivate the students' abilities in some ways to make them more proficient in the future work process, be able to flexibly deal with some problems in the work, and deal with them through their own learning.

2. THE REASONS FOR THE LACK OF PRACTICAL OPERATION ABILITY OF ACCOUNTING MAJORS IN COLLEGES AND UNIVERSITIES

(1) The teaching staff has relatively shallow qualifications and insufficient ability

Under the guidance of the national training policy for accounting students, the school also attaches great importance to the cultivation of students' relevant ability. But in the process of training, there will be many problems, the most important one is the lack of comprehensive ability of teachers. Among the accounting teachers in Colleges and universities, most of them are fresh graduates or graduate students, so their practical experience and practical ability are relatively scarce. Therefore, colleges and universities pay more attention to the teaching of relevant theoretical knowledge when teaching accounting majors, but there are some negligence in the teaching of practical operation related ability. The lack of accounting experience of accounting teachers in Colleges and universities directly leads to that they only carry out some written teaching and pay attention to theory. However, accounting is a discipline

that requires practical operation ability. Therefore, colleges and universities need to innovate the teaching staff and introduce fresh blood.

(2) The teaching assessment method is backward

Another major factor affecting the practical operation ability of accounting majors in Colleges and universities is the backward teaching and assessment methods in Colleges and universities. The assessment method of colleges and universities is "classroom performance + final examination results". Such a traditional assessment method also makes college teachers ignore the cultivation of students' practical operation ability. Not only that, but also breed some bad phenomena, such as leading students to form the thought of "only score theory, only score theory", and only want to achieve a good result [2]. In class, students focus on class check-in and ignore the learning of class content. When they are unable to attend class, they even look for someone to sign in for them. In the long run, this phenomenon is more common, which seriously disrupts the classroom order, leads to the chaos of the style of study, and students ignore the learning content.

(3) There are few practical operation courses

In most colleges and universities in China, the lack of practical operation courses is also the reason for students' weak practical ability. Accounting major has higher requirements for students' practical ability, which requires students to carry out corresponding practical training. Only in school, students can have certain practical experience, then in the future work can they be handy and flexibly deal with some financial problems. However, in Colleges and universities, due to the lack of teachers in Colleges and universities, and the lack of experience in the practical operation courses of the accounting department, although some colleges and universities have set up relevant courses, they are still in the exploratory stage, lacking a systematic management experience. The lack of practical operation courses in Colleges and universities also directly leads to the lack of attention and interest of students for practical courses. Students' interest in practical courses is not high and attention is not enough, as well as less efficient practice courses, resulting in students' general practical operation ability [3].

3. WAYS TO CULTIVATE THE PRACTICAL ABILITY OF ACCOUNTING STUDENTS IN COLLEGES AND UNIVERSITIES

(1) Improve teachers' practical experience and operation ability

For the lack of teachers in Colleges and universities, colleges and universities should pay attention to the problem. In the recruitment of teachers, we should not only pay attention to teachers' academic background, but also pay attention to teachers' practical experience. In addition, for the accounting teachers in Colleges and universities, the school should also organize relevant lectures and learning activities, invite experts and scholars from the accounting industry to give lectures in Colleges and universities, so that the accounting teachers can improve their academic ability

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and learn some accounting experience. In the future teaching process, teachers can also carry out relevant case teaching, so that students can not only carry out some written learning, but also learn from practical cases, which can effectively stimulate the learning interest of accounting students, and also meet the new national teaching policy for accounting students. The improvement of teachers' practical experience and operation ability is of great help to improve the practical ability of accounting students [4].

(2) Reforming backward teaching methods and examination system

In the traditional assessment of accounting major in Colleges and universities, teachers usually use classroom performance and final examination results as the assessment method. For example, in order to get a good score, students will focus on some formal small things, such as answering in class. If the students can't sign in in time one day, they may even find someone to answer for themselves. Such a situation will also seriously disrupt the teaching order, not only can not achieve the purpose of classroom teaching, but also breed some bad habits, so that students can not learn the relevant learning content at all, but will form some bad learning methods, such as "fraction only theory". Therefore, in the future teaching process, the school should vigorously reform the teaching methods and assessment system, take some practical operation courses as the main teaching direction, and increase the cultivation of students' practical ability. In the final assessment process, the school needs to improve the assessment method, take the students' practical ability as the focus of the assessment, and organize some accounting related skills competitions to assess the students' practical ability [5].

(3) Enrich students' training projects and operation opportunities

Previously, colleges and universities used to pay attention to the cultivation of accounting students only in academic theory, but this kind of teaching form will cause many problems, such as students' lack of practical ability, single school teaching method and lack of classroom teaching vitality. Therefore, colleges and universities should improve teaching methods and actively carry out some practical activities, such as arranging students to practice in some enterprises, setting up accounting laboratories and carrying out practical training in the classroom. According to the characteristics of the accounting major, the school can actively carry out long-term cooperation with some enterprises, arrange accounting students to practice in enterprises, which can not only effectively exercise students' time operation ability, but also cultivate reserved talents for enterprises. In addition, the school should establish relevant accounting laboratory and introduce some hardware and software facilities to provide equipment guarantee for students' practical operation ability. In the classroom training, teachers can use Excel financial management application or financial management curriculum design, and comprehensive training can use advanced financial audit or ERP sand table experiment. In

some specific practice process, teachers can guide students to use computers to do accounts, so that students can effectively use the relevant electronic equipment. The above practical operation opportunities can effectively provide some practical operation platforms for students and effectively cultivate their practical operation ability [6].

4. CONCLUSION

In recent years, accounting fraud cases occur frequently in enterprises, and the state attaches great importance to such cases, and has issued specific training programs for accounting majors, which require students to have professional ability, professional quality and management ability. However, in the traditional accounting teaching in Colleges and universities, the school pays more attention to the cultivation of students' practical ability. The reasons for these problems are the lack of professional teachers, the lack of courses and the students' insufficient attention to practical ability. Based on the above problems, the school should take corresponding measures in time, by updating the teaching team, training teachers' professional ability, adding relevant practical courses and reforming the teaching evaluation mechanism of the college [7].

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On the Measures to Cultivate the Moral Quality of Local College Students

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Abstract: As an important cornerstone of contemporary social development, the quality of college students has been widely concerned. In recent years, there are many moral conflicts, and because college students are still in the shaping and stereotype, in the spiritual level, they are more vulnerable to the influence of the outside world, so there are some problems in the aspect of moral quality, which need to be cultivated. This article will talk about some superficial opinions on the measures to cultivate moral quality. Today is in an information age, people's communication is becoming more and more convenient, and the mutual influence between people is also expanding. Each person's behavior will inevitably be affected by other people's thoughts, so as to change their own moral quality. The communication between people needs to have good moral quality. As the favored son of heaven, college students should have noble moral quality. Only in this way can they grow up healthily and become a person in line with the requirements of contemporary social development.

Keywords: College Students; Moral Quality; Measures

1. ENHANCING COLLEGE STUDENTS' MORAL COGNITION

① Let college students understand what is moral quality

From the previous research and analysis, in terms of influencing factors, college students themselves occupy an important position. Therefore, if we want to solve the problems existing in the cultivation of local college students' moral quality, we must first make them understand what is moral quality. There is a saying that "those who do not know are fearless", and Youdao is able to better restrict their own code of conduct only when they understand it. Only when students understand what is moral quality and what is its connotation, can they use the code of conduct of moral quality to restrain themselves and make their words and deeds approach the direction of good moral quality. If contemporary college students don't know what moral quality is, how can they judge whether they have good moral quality?

② Let local college students understand the significance of good moral quality

College students should not only know what moral quality is, but also understand the significance of good moral quality. Take honesty and trustworthiness as an example, if college students can have the good moral quality of honesty and trustworthiness, then they will have a set of their own way of doing things, which can convince the surrounding relatives and friends. In today's information age, more and more people value the good moral quality of honesty and trustworthiness. In addition, it has more

significance to have good moral quality. From a small point of view, it can help contemporary college students to shape the correct three outlooks, so that their relatives and friends around them are beneficial; from a large perspective, it not only benefits the surrounding, but also is useful to the society.

③ Pay attention to the positive moral cognition of college students

In addition to the above two measures, there is an important problem is not to let college students have a conflict with the cultivation of moral quality. We all know the influence of personal emotion on our own behavior. When we judge a thing, everyone will be affected by their own subjective factors, and the judgment results will more or less have subjective factors. Therefore, in the process of cultivating the moral quality of contemporary college students, we should pay attention to the positive moral cognition of contemporary college students. Once college students accept good moral quality from emotion, they will be strict with themselves in behavior, which is conducive to the cultivation of good moral quality of college students.

2. CULTIVATING GOOD MORAL EMOTION FOR COLLEGE STUDENTS

① Parents should establish a positive family atmosphere

Among the causes of the problems existing in the cultivation of moral quality of local college students, the influence of family has been discussed emphatically, and in this aspect, the influence of parents is very important. Therefore, how the family atmosphere of college students is very important.

In order to develop a good moral quality of college students, parents should establish a positive family atmosphere, so that children can more easily develop a positive character, have good moral character, give positive affirmation to moral emotion, develop moral quality and have moral emotion.

② Set an example and teach by example

Imitation is the survival instinct of human beings, and college students in their adolescence can imitate everything of others. We all know that the influence of teaching by example and words on people can not only make people change themselves unconsciously, but also avoid being contradicted by the parties. We are deeply influenced by their words and deeds. If parents have good moral quality, noble conduct, then in the day and night together can slowly affect the child's behavior, let the child form a good moral quality. On the contrary, if parents behave badly and behave rudely, the children will also catch the bad habits of their parents. Therefore, we must

pay attention to parents to develop good behavior, to set an example, teach by example.

3. POSITIVE AFFIRMATION OF MORAL BEHAVIOR

① Improve the status of moral education and increase the intensity of moral education

Our leader stressed that we should comprehensively implement the party's education policy, follow the law of education, accelerate the modernization of education, and run a satisfactory education for the people.

The contemporary society should cultivate all-round development of contemporary college students, rather than only focus on intellectual education. For the cultivation of College Students' moral quality, it is far from enough to strengthen the education, but also to improve the status of moral education and increase the strength of moral education. Only when the position is high and the strength is great, can the school pay more attention to the moral education of college students, and the students can contact with the moral education for a longer time and have a deeper understanding, which is more conducive to the cultivation of the moral quality of local college students.

② Improve teachers' moral quality and develop good moral behavior

Many teachers in the ideological and moral classroom have lowered the requirements of students: as long as people can be in, do not make trouble[1]. The problems existing in the cultivation of moral quality of local college students include that teachers attach importance to their studies and ignore the cultivation of moral quality, and students attach more importance to scores and do not pay too much attention to their own quality cultivation. Therefore, how the moral quality of teachers themselves is of great significance to the moral quality of college students. In the process of Cultivating College Students' moral quality, we should also pay attention to improve teachers' moral quality and train a group of high-quality teachers.

③ Carry out the practical activities of cultivating the moral quality of contemporary college students

In the school, in addition to strengthening moral education and training high-quality teachers, the most important thing is the students themselves. We should carry out practical activities to cultivate the moral quality of contemporary college students.

It is useless to cultivate the moral quality of college students just by talking on paper. Therefore, it is necessary to carry out practical activities to cultivate the moral quality of contemporary college students. Colleges and universities can carry out more practical activities to cultivate the moral quality of contemporary college students, so that contemporary college students can turn the theoretical understanding of moral quality into their own practical action, so as to really improve the moral quality of contemporary college students and make them have good moral quality.

4. ON THE MORAL QUALITY OF LOCAL COLLEGE STUDENTS TO ACTIVELY SHAPE THE SOCIETY

① Improve the social atmosphere and vigorously

promote the core values

Mengmu, choosing the neighborhood and optimizing the social moral environment, plays an important role in the process of Cultivating College Students' good character [2].

Nowadays, the society is filled with the atmosphere of material and interest supremacy. Although college students live on campus and have less contact with the society, they can still be influenced by the social atmosphere. What's more, under the impact of western ideological trend, college students pay attention to fashion and yearn for fashion craze, so they are more affected. In order to cultivate the moral quality of college students, we must improve the social atmosphere, vigorously carry forward the core values, and create an atmosphere full of positive energy in the society. In this way, college students live in a world full of love and kindness, so that they can easily grow into a towering tree.

② Strengthen the propaganda of moral education environment

General Secretary Xi Zhi pointed out at an online conference: "cyberspace is the common spiritual home of hundreds of millions of nations. The social atmosphere can affect the moral quality of college students because of the spread of ideology and culture and large-scale flow, resulting in a large number of people. College students are in a new era of positive and rapid development of science and technology, and they have strong ability to accept new things. Coupled with the existence of the Internet world, college students will bear the brunt of the impact.

Due to the uneven moral quality of people, coupled with the virtual network world, there is no mature legal policy, which leads to the network world miasma, spread a variety of vulgar, low interest culture.

Therefore, for the cultivation of College Students' moral quality, we must purify the network environment, speed up the implementation of relevant network laws and regulations, and eliminate the bad wind of the network. At the same time, we should make good use of the network to educate people.

Today we are in a new era. As a college student, we shoulder the great responsibility of national rejuvenation. We must have good moral quality to make contributions to the development of our country. College students are in an information age, affected by various aspects. In addition, college students themselves are still shaping and shaping the three outlooks. They are not stable in terms of moral cognition, moral emotion, moral will and moral behavior. Therefore, it is necessary to cultivate college students' moral quality and make them become a person with good moral habits.

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Research on the Application of Flipped Classroom Based on Micro Class in Higher Vocational English Teaching

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Abstract: With the rapid development of science and technology, the whole society has entered the Internet era. In the fields of education, Internet-based teaching equipment is widely used in teaching activities. The flipped classroom, as the product of this era, not only changes the traditional teaching mode, but also enriches students' teaching resources. Therefore, it is widely discussed in the current higher vocational education. By explaining the characteristics of the flipped classroom teaching mode of the micro class, this paper aims to analyze the features of flipped classroom mode, and puts forward some suggestions to improve the practicability of the flipped classroom mode in English classroom of higher vocational colleges.

Keywords: Higher Vocational College; Vocational English; Micro Class; Flipped Classroom

1. THE INTRODUCTION OF TEACHING MODE OF FLIPPED CLASSROOM IN MICRO CLASS

With the increasing progress of science and technology, great changes have taken place in the teaching mode, mainly showing in the application of multimedia teaching equipment and the trial of flipped classroom teaching mode in higher vocational colleges. The so-called micro class flipped classroom is a form of education and teaching activities through network technology, video, online platform, etc. Micro-class flipped classroom has a lot of differences with the traditional teaching mode and reverses the traditional learning mode of students. Students can learn through both offline independent studying and online knowledge sorting. Faced with new challenges, some vocational colleges have adopted the flipped classroom teaching mode of micro class, but there are still some areas for improvement. Therefore, we should constantly update teaching ideas and methods, improve the quality of classroom teaching, make better use of the flipped classroom in teaching, and modify the efficiency of classroom teaching.

Through the implementation of flipped classroom teaching model, students' autonomous learning mode has been changed, such as the carrier of students' learning in the classroom. Pictures and audio, for English learning, combined with audio-visual mode are of great significance for students' learning, which are conducive to helping students create a good learning atmosphere and enhance their language learning environment. In addition, vivid and interesting video playback is conducive to enhancing students' learning desire, improving their

motivation to learn, attracting their attention and improving students' concentration. Under the traditional teaching mode, English classroom teaching is usually dominated by teachers' instruction and students' passive acceptance of knowledge. In addition, many teachers usually use the full class teaching method when teaching English, and some theoretical knowledge and basic content are ignored, and the interaction between students and teachers is also neglected in the classroom. As a result, students' interest in learning is easy to disappear slowly, and they often feel that English learning is boring. However, the application of flipped classroom teaching mode in micro class is conducive to improving the subjectivity of students' learning, strengthening the effective interaction between teachers and students, improving the depth and breadth of English learning, and providing opportunities for students to find and solve problems. Finally, in the process of offline autonomous learning, because the learning object is one-to-one video, they can repeatedly listen to the problems that they will not encounter, so as to enhance students' understanding of knowledge and deepen their mastery of knowledge points. In the process of English teaching, the application of new teaching mode allows students to give up the traditional passive learning and become active learning. In teaching, teachers are no longer the main body of teaching, but can start from the perspective of students and take the needs of students as the teaching goal, which involves improving students' learning enthusiasm and promoting their learning efficiency. Secondly, the teaching mode of micro class flipped classroom enriches students' learning methods and enhances their learning efficiency. The application of the teaching mode of micro class flipped classroom also expands the depth and breadth of students' knowledge. Students can be free to choose the suitable time to watch micro class videos, deepen their understanding of key and difficult contents in the classroom, and achieve the purpose of a true understanding of the knowledge points. Finally, through the use of micro class flipped classroom teaching mode, a good learning atmosphere is available for students. For example, students can collect questions through the platform of micro class, put forward questions. Teachers can keep track of students' learning before class and focus on answering students' difficult questions. In this way, an effective interaction between teachers and students is achieved. In addition, teachers can also realize real-time interaction with students through the online platform of

micro class flipped classroom. Students can ask questions online immediately after encountering problems, and teachers can also give timely answers. Such good interaction can make students' learning more convenient and smoother.

2. THE APPLICATION OF FLIPPED CLASSROOM OF MICRO CLASS IN ENGLISH TEACHING IN HIGHER VOCATIONAL COLLEGES

2.1 Solve the key points and difficulties in English teaching

Based on the current situation of English teaching in vocational colleges, teachers apply the micro class flipped classroom teaching mode to sort out the key and difficult knowledge in the classroom for the purpose of improving the classroom efficiency. To be specific, due to the different foundations, students have different problems in basic English reading. Some students do not have enough vocabulary to understand the text. Some students cannot understand the differences in English culture, while some students have a good foundation and need to be further improved. In the traditional classroom teaching, the consistent practice is that the teacher solves the students' problems one by one. It is easy to let students without the same problem feel boring and the valuable time is wasted. However, with the help of the flipped classroom teaching mode of micro class, teachers record the problems of different students by making different micro class videos, so that students can learn the materials by themselves before class. For example, for some problems of English language expression characteristics, teachers can use unified production for comparison, and use Chinese and English proverbs to improve students' interest in learning. Teachers can solve students' basic problems through micro lesson videos before class. In classroom teaching, teachers can conduct more classroom activities. After class, the teacher can focus on some key problems and difficult problems, assign targeted homework, strengthen students' memory of key and difficult knowledge, and train students' English thinking abilities.

2.2 Cultivate students' self-study ability

During the application of micro class flipped classroom teaching mode, first of all, we should establish a guiding teaching context. Teachers should lay emphasis on cultivating students' autonomous learning ability and their awareness of autonomous learning. Through a series of guidance for students and the cooperation between teachers and students to complete learning goals, students' enthusiasm and initiative can be stimulated. What's more, a reasonable guidance context should be built to help students set clear objectives, identify their own interest, and improve students' English comprehensive quality from various aspects. In the process of micro class video production, students' interests and hobbies should be taken full consideration, as well as the real levels of learning. For the reasonable production of video content, we should correct our own role, help students arrange reasonable order to learn the micro lessons, and let students learn from easy to difficult. Finally, we should focus on the cultivation of students' autonomous learning ability by using the flipped platform of micro class. For

example, we can carry out an online learning platform system through mobile QQ and WeChat in teaching. Teachers can release learning tasks through these platforms in time, and share some English common sense videos after class every day. An English short story video can imperceptibly improve students' comprehensive English quality. With these platforms, students can communicate with teachers and students in a timely manner to ensure effective learning, guide students to do after-class reflection, develop the habits of self-study and thinking in English, and comprehensively consolidate their English learning.

2.3 Innovation of English consolidation practice

In the current vocational English micro class flipped platform course application, we usually use the teaching platform of Camtasia Studio, which not only includes our daily video recording, courseware production and other functions, but also many post-school consolidation exercise functions, which has important technical support significance for teachers' innovation and English consolidation practice. In the traditional after-school exercises of English course, students are usually consolidated by paper-based exercises, which are easy to make students feel tired and take for granted. In the consolidation practice mode of micro class flipped classroom, a more vivid and flexible way arises. For example, the game setting of word breakthrough can be introduced to help students memorize words in the process of playing, so that students carry out vocabulary memorizing in a relaxing and pleasant learning atmosphere. In addition, English learning is by no means point-to-point, and each knowledge point of English is closely related. Therefore, in the review and consolidation of knowledge points after class, we can also use the platform of flipped classroom to integrate relevant knowledge, help students sort out the knowledge classification, so as to promote students' mastery of knowledge. The traditional assignment of homework is generally based on writing, while the oral and listening practice can not be effectively supervised. In the flipped classroom teaching mode of micro class, all of the above defects can be solved by means of dubbing. Finally, we can share some English applications in specific work situations after class, so as to improve students' awareness of the importance of English application in work, promote students' practical communication ability and enhance their future employment competitiveness.

To sum up, the teaching mode of flipped classroom of micro class can effectively solve many disadvantages of English teaching in higher vocational colleges. The scope and frequency of this teaching mode should be improved, which can help English teachers solve practical problems encountered in teaching, and improve the quality of teaching. At the same time, it can make students get more interested in English learning and cultivate students' professional ability.

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A Study on Strategies for Freshmen to Learn College English--from the Theory of Constructivism

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Abstract: College English is a compulsory course for non-English majors and plays an important role in higher education. Starting from the syllabus and requirements, guided by the constructivist learning theory, and based on the author's years of experience in applied psycholinguistics, the author analyzes the strategies and methods for college freshmen to effectively learn College English.

Keywords: College English; College freshmen; Constructivism; Learning strategies

1. NATURE AND OBJECTIVES OF COLLEGE ENGLISH TEACHING

College English course teaching is an organic part of higher education, and college English course is a compulsory basic course for college students. It takes English language knowledge and applied skills, learning strategies and cross-cultural communication as its main content, foreign language teaching theory as its guidance, and various teaching modes and means as one teaching system. The teaching aim of college English course is to cultivate the students' English comprehensive application ability, especially listening and speaking skills, to make the college students in the future work and social activities can effectively in both English written and spoken communication. At the same time, to improve their ability of autonomous learning, improve the comprehensive cultural quality, to adapt to the inevitable requirement of social development in our country and international communication. The purpose of English teaching in China must be clear, that is, to use the language as a carrier, to enable students to read foreign relevant literature, to understand foreign advanced science and culture, to understand the culture and system of western society and to carry out exchanges between China and foreign countries. With the boom of new media, we can make use of various teaching resources through the Internet, enhance our understanding of the West by watching Western movies and TV programs, give play to students' thinking, emphasize the comprehensive application of natural science and social science, and emphasize the combination of science and humanities.

After the reform, the teaching content of college English course should develop towards the direction of practicality, should be of high interesting and cultural, should pay attention to the combination of various teaching equipment and teaching means, make good use of multimedia resources and network resources. In terms of teaching, it emphasizes a harmonious, democratic and

participatory learning atmosphere, which makes the teaching scene more colorful and the teaching methods keep pace with The Times. The evaluation system for teachers should also be humanized and scientific, practical and controllable, otherwise it will only exist on the surface. There should also be relevant measures to encourage teachers, mobilize the enthusiasm of teachers. Strengthen students' subjective consciousness, make them actively participate in learning, help them firm their faith, set up goals, and strive towards the goal. As for the freshmen, how can they adapt to the teaching and learning of college English courses as soon as possible and successfully meet the general requirements? Based on the constructivist learning theory, this paper explores strategies for college freshmen to learn English effectively.

2. CONSTRUCTIVIST LEARNING THEORY AND STRATEGIES FOR EFFECTIVE LEARNING OF COLLEGE ENGLISH COURSES

2.1 Overview of constructivist learning theory

Constructivism, which was first proposed by the Swiss cognitive psychologist Piaget. This statement of Piaget has a strong materialist dialectics color. He thinks that the interaction between internal and external causes is the most reasonable angle to study the cognitive development of children. Constructivism has a profound connotation, which can be divided into three parts: how to determine the student-centered core status, and how to mobilize the enthusiasm of students to learn by themselves, to build their own knowledge architecture system so as to fulfill their own progress.

This theory distinguishes itself from other teaching methods, which is an avant-garde method of inquiry-based learning. Teacher just plays an auxiliary role, emphasizing the student's initiative in the whole process. But how the teacher guides the students and develops the potential of the students is really the key to the whole problem. To this, some scholars put forward several methods: so "scaffolding instruction", "anchored instruction" and "random access instruction" and so on, that is: given a basic framework to let the students thrown around this framework to construct the main learning problems, lead the students to learn according to the orientation, without preliminary requirements. The psychological basis of learning mode is derived from the theory of children's cognitive development put forward by Piaget. In the research process of this theory, it is found that the knowledge taught by teachers can not become the knowledge of students eventually, and the real knowledge is constructed by students themselves. Students learn by

themselves, analyze by themselves, and eventually have their own system to form their own knowledge. Therefore, "meaning construction", "communication", "situation" and "collaboration" are four factors in learning atmosphere. Therefore, the use of constructivism can well explain the cognitive rules in the process of human re-learning, and can well explain how learning occurs, what kind of meaning, how it is constructed, how it is formed, and even what elements the ideal learning conditions should have, etc. Therefore, through the thought of constructivism, we can know a series of novel theories and principles of cognitive learning, and create what kind of environment for students to learn better. The basic content of constructivist learning theory can be expounded from two aspects, namely "the meaning of learning" (that is, "what is learning") and "the method of learning" (that is, "how to learn"). Based on this theory, this paper will focus on exploring effective methods for freshmen to learn College English courses.

2.2 Strategies for effectively learning College English courses

"Connection" and "thinking" are the key to the construction of meaning. Figuratively speaking, it is what the current learning refers to, what is related to it and what you know, combining and associating two things to consider. If the process of combining and associating thinking is combined with cooperative learning, that is, the process of discussing and communicating among students, then students will have higher efficiency in constructing meaning and do more in-depth learning. The consultation should include two aspects: one is self-consultation; the other is mutual consultation. As the name implies, self-negotiation is negotiating with oneself, independently judging what is right and wrong, what should be done and what should not be done; Mutual consultation is the premise of many people, mutual discussion, debate, and learning process. This is based on specific events in the reality. Let the students face the reality, and then analyze according to the actual situation and their own cognition. Finally, they come to their own conclusions, that is, the realistic scenario teaching method.

Foreign language learning is the pursuit of effective conversion between the language you are learning and your own language. It can change the standpoint, angle and way of thinking of the target language, realize role transformation between the mother tongue and the target language, and effectively obtain information. The deep level of language learning is to learn a culture and a way of thinking. In Our country, many middle school students are not interested in learning English, but under the pressure of further education, which is the product of exam-oriented education. In the college stage, although there is the pressure of CET-4 and CET-6, the learning environment is more relaxed and open-minded. Attention should be paid to the development of quality-oriented education to improve students' comprehensive ability. We all know the importance of English, it is not only a tool for China to understand and learn from foreign advanced science and technology, system and culture, but also an indispensable tool for foreign communication. Therefore, ACADEMIC PUBLISHING HOUSE

first of all, freshmen must be clear about their purpose of learning English, not just to pass the exam, but to communicate in English (including oral communication and written communication). Setting up this communicative learning motivation will play a good role in guiding the development and adjustment of English learning strategies in the future.

It is important to cultivate the interest in learning English, and stimulate the learning motivation. The requirement of exploration and discovery requires students to take the initiative to collect and analyze relevant information and materials in the process of constructing meaning, and also find weaknesses and overcome them in time. Constructivism holds that knowledge is unique in its interpretation of reality, because it is the construction of knowledge through the understanding of reality, with a deep foundation and vigorous vitality.

Due to different English learning foundations, some freshmen can not even meet the basic requirements of middle school English syllabus, some others can not meet the requirements of college English course teaching, and also some stay at the level of senior high school. Many students consider that when they enter the university, English is not as important as their majors. As a result, they lost their passion for English. Once this negative psychology continues to spread, it will affect the students' mood even more. Therefore, it must be solved through various ways so that freshmen can build up self-confidence, be full of passion for learning English and adjust their psychological state. Students' enthusiasm for Learning English can be stimulated by watching English movies and holding English song contests. Mobilizing the enthusiasm of students to learn English well in the freshmen is the key to a college. Only by making freshmen want to learn English can they carry out English teaching activities better.

To cultivate the sensitivity of cross-cultural communication, constructivist learning theory holds that the two main ways for learners to change their cognitive structure are assimilation and adaptation. From the perspective of cognitive structure, assimilation is quantitative change, while adaptation is qualitative change. It is generally believed that learning is not a simple accumulation of information, otherwise there will be conflicts between old and new knowledge, conflicts between old and new experience, and even problems in cognitive structure. Learning is the replacement of old knowledge with new knowledge, the reorganization of knowledge structure and the expansion of knowledge system. Learning is not just storage and absorption, but thinking, processing after the evolution, should have their own things. The learner interacts with the environment itself.

There are actually three levels for Chinese to learn English: first, the language level; The second is cultural; The third is the level of thinking mode; Some people have a good command of English vocabulary and can speak English fluently, but they just can't communicate well with foreigners until they get into their culture. This is because their English learning stays at the linguistic level. Because

of the huge difference between Chinese and Western traditional culture, people's character and value tendency are different. Chinese people take modesty as a virtue and are relatively introverted, while Westerners advocate individualism and like to show themselves. When communicating with them, language expression should not only be grammatically correct but also conform to social etiquette. Otherwise, misunderstanding will result in communication failure.

3. CONCLUSION

Constructivist learning theory emphasizes the initiative, sociality and situation of learning, emphasizes the active construction of learners on the basis of existing experience in the learning process, and emphasizes the active consciousness of learners, so as to promote the overall development and sustainable development of human beings. This idea reflects the development of college English course teaching mode and the value orientation of teaching reform. The author has been engaged in college English course teaching for many years, and has

communicated with other colleges and universities to find problems in the teaching process. Based on the constructivist learning theory, the author summarizes the above strategies and hopes to help freshmen to adapt to college English course teaching as soon as possible, so as to achieve double results with half the effort in English learning.

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Automatic Sleep Staging Based on EEG and EOG Signals

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Abstract: The purpose of this study is to propose an automatic sleep staging method which combines Electroencephalogram (EEG) and Electrooculogram (EOG), Polysomnography (PSG) signals in sleep EDF database are selected, including two channel EEG signals and one channel EOG signal. Firstly, the signal is preprocessed by filtering, and then the signal feature is extracted. Finally, in the classification stage, using support vector machine (SVM) model and BP neural network (BPNN) model, the sleep process is divided into six stages, and the classification effect of the two classifiers and different combinations of PSG signals is compared. The results showed that the classification accuracy of the two models using two channel EEG and one channel EOG signal combination reached 93.88% and 95.08% respectively, which were 6.15% and 8.75% higher than that of single channel EEG. The model has good generalization ability, so the proposed automatic sleep staging method is feasible.

Keywords: PSG signals; Feature extraction; Support vector machine; BP neural network; Automatic sleep staging

1. INTRODUCTION

About 27% of people in the world have sleep problems [1], and sleep problems have attracted more and more attention. In practice, the evaluation of sleep quality and the treatment of sleep related diseases depend on accurate sleep staging. Sleep staging can detect potential sleep problems and prevent related diseases by accurately describing the state switching during sleep. Therefore, the study of sleep staging is of great significance for the diagnosis and treatment of diseases.

The classical method of sleep staging is to extract the characteristic parameters of EEG signals by different analysis methods, and then use the classifier to classify. At present, the analysis methods of EEG mainly include time domain, frequency domain and nonlinear.

In order to further improve the accuracy of sleep staging, researchers propose to use other physiological electrical signals to study sleep staging, such as EOG, EMG, ECG and so on. In reference [2], based on EEG and EMG signals, the method of combining sample entropy with support vector machine was used, and the accuracy rate of staging was 92.94%. In reference [3], It extracted the time domain characteristics of EMG and EOG, and used adaptive threshold method to stage sleep. The average accuracy was 82.93%.

This paper aims at the problems of single physiological signal type, less feature extraction and low accuracy of sleep staging. In this paper, we propose a multi feature

sleep staging method based on EEG and EOG. The experimental process is shown in Fig.1.

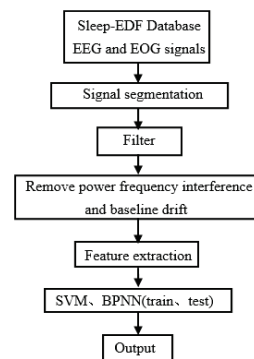


Figure 1. Experimental flow chat

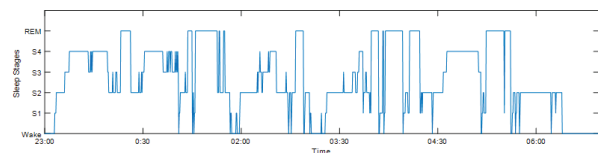


Figure 2. Sleep records of the whole night

2. EXPERIMENTAL DATA DESCRIPTION

The experimental data is from Sleep-EDF Database Expanded in PhysioNet[11]. The selected data set contains 95 hours' data of 4 subjects, including PSG data of two types and three channels and corresponding sleep staging experts' annotation. These labels are manually labeled by technicians according to R&K Rules[4] for each 30s sleep segment. The data of the three channels are EEG data of one FPZ-CZ channel and one PZ-OZ channel, as well as the data of one Horizontal EOG channel. The signals of each channel are sampled at 100Hz, and all signals are divided into 30s epoch. Each segment of data contains 3000 data points.

Rechtschaffen and Kales proposed the R&K Rules[4], in which each 30s sleep segment was labeled as Wake(W), Non-Rapid Eye Movement (NREM), or Rapid Eye Movement(REM). The NREM stage can be subdivided into S1, S2, S3 and S4 stages. The NREM stage can also be divided into shallow sleep stage (including S1, S2) and deep sleep stage (including S3 and S4). Phase W is defined as the awakening stage before or after sleep. S1 is the first stage of sleep, when brain activity slows and muscles relax. The second stage is the real beginning of sleep, when eye movement stops. The third stage is called deep sleep, when the subjects' brain function declines significantly. Deep sleep activity continued during S4 sleep. The eye is closed during REM, but it also moves rapidly.

Fig.2 shows the subjects' sleep state about 8 hours a night,

and Table 1 shows the distribution information of each sleep stage in the label.

Table 1. Detailed information about the sleep database records used in this study

Sleep Stages	Epochs	Proportion
Wake(W)	7722	68.3%
REM(R)	741	6.5%
S1	286	2.5%
S2	2036	18%
S3	289	2.6%
S4	240	2.1%
Total	11314	100%

3.METHOD

3.1 IIR Digital Filter

The system functions of IIR digital filter are as follows:

$$H(Z) = \frac{\sum_{j=0}^M b_j z^{-j}}{1 - \sum_{i=1}^N a_i z^{-i}} \quad (1)$$

Where a_i, b_j is the filter coefficient, M and N can be arbitrary nonnegative integers.

Corresponding difference equation:

$$y(n) = \sum_{j=0}^M b_j x(n-j) + \sum_{i=1}^N a_i y(n-i) \quad (2)$$

3.2 Nonlinear Support Vector Machine

SVM has many unique advantages in solving small sample, nonlinear and high dimensional pattern recognition. The basic idea of the nonlinear SVM problem is to transform the input variable x into a high-dimensional space through nonlinear transformation, and then transform the space to find the optimal classification surface[5].

Optimization objectives of nonlinear problems:

$$\begin{aligned} \max L(\alpha) &= \sum_{i=1}^N \alpha_i \\ &= \sum_{i=1}^N \alpha_i - \frac{1}{2} \sum_{i=1}^N \sum_{j=1}^N \alpha_i \alpha_j y_i y_j k(x_i, x_j) \end{aligned} \quad (3)$$

$$\sum_{i=1}^N y_i \alpha_i = 0, 0 \leq \alpha_i \leq C, i = 1, 2, \dots, N \quad (4)$$

The corresponding judgment function:

$$y = \sum_{i=1}^N y_i \alpha_i k(x_i, x) + b \quad (5)$$

If $y \geq 0$, it is a class, and the category is 1, otherwise it is -1.

$k(x_i, x_j)$ is kernel function, In this paper, we choose sigmoid kernel function:

$$k(x_i, x_j) = \tanh(\beta x_i^T x_j + \theta) \quad (6)$$

Where \tanh is a hyperbolic tangent function, $\beta > 0, \theta < 0$.

3.3 BP Neural Network

The work flow of BP neural network is as follows: for each training sample, input examples are provided to input layer neurons, Then the signal is transmitted forward layer by layer until the result of output layer is produced; Then

the error of the output layer is calculated, and then the error is propagated back to the hidden layer neuron. Finally, the connection weight and threshold are adjusted according to the error of the hidden layer neuron. The iterative process is repeated until some stop conditions are reached[6]. The specific calculation process is as follows: Input: Training set $D = \{(x_k, y_k)\}_{k=1}^m$; Learning rate η . All connection weights and thresholds in the network are randomly initialized in the range of (0, 1).

Calculate current sample output:

$$\hat{y}_k = (\hat{y}_1^k, \hat{y}_2^k, \dots, \hat{y}_l^k) \quad (7)$$

$$\hat{y}_j^k = f(\beta_j - \theta_j) \quad (8)$$

The gradient term of the output layer neurons is calculated.

$$g_j = \hat{y}_j^k (1 - \hat{y}_j^k) (y_j^k - \hat{y}_j^k) \quad (9)$$

The gradient term of hidden neurons is calculated:

$$e_h = b_h (1 - b_h) \sum_{j=1}^l w_{hj} g_j \quad (10)$$

Update connection rights $w_{h,j}, v_{ih}$ and threshold θ_j, γ_h .

$$\Delta w_{hj} = \eta g_j b_h \quad (11)$$

$$\Delta \theta_j = -\eta g_j \quad (12)$$

$$\Delta v_{ih} = \eta e_h x_i \quad (13)$$

$$\Delta \gamma_h = -\eta e_h \quad (14)$$

After reaching the stop condition.

Output: Multilayer feedforward neural network with connection weight and threshold determined.

4.EXPERIMENTAL PROCESS AND RESULTS

4.1 Signal Preprocessing

EEG and EOG are usually interfered by some unknown frequencies, especially EEG, so these noises should be suppressed. In this paper, EEG and EOG signals are filtered by high pass filter with 0.3 Hz cut-off frequency and low-pass filter with 30 Hz cut-off frequency[5]. The fourth-order IIR digital filter is used to remove noise and artifacts.

Zero phase shift filter is used to correct baseline drift. Zero phase shift filter means that the phase of a signal sequence does not change after filtering, that is, the phase response of the filter system function is zero.

Fig.3 shows the waveforms of EEG and EOG signals of three channels. Due to the large amount of data, only 30s of data is shown here. Fig.4 is the waveform of the three channel signals after preprocessing. It can be seen from the figure that the signal burr is greatly reduced and the baseline drift of the signal is corrected.

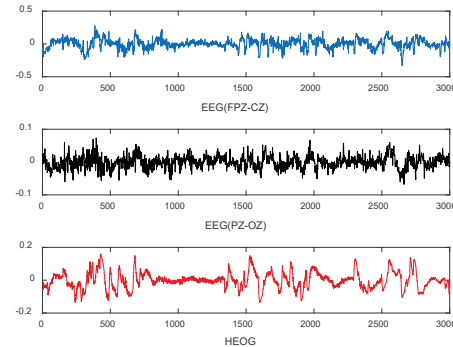


Figure 3. Time domain waveform of three channels

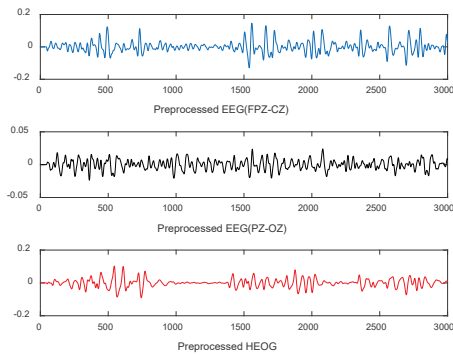


Figure 4. The signal waveform after preprocessing

4.2 Feature Extraction

In the feature extraction stage, 27 features of EEG signal are extracted from time domain(TD) and frequency domain(FD) respectively. There are 14 time domain features and 13 frequency domain features. A total of 14 features were extracted from the EOG signals. A total of 68 features are extracted from the three channels [5]. All the extracted features are listed in Table 2.

Fourteen time domain characteristics are derived from EEG and EOG signals. These statistical parameters reflect the amplitude and distribution of time series.

The power spectral density (PSD) of EEG was calculated from four frequency bands of 0.3-4Hz (delta), 4-8Hz (theta), 8-16Hz (alpha) and 16-30Hz (beta). The total power spectral density of EEG was calculated in the frequency range of 0.3-30Hz. The calculation of power ratio in EEG feature extraction is based on relative spectral power, Calculate the power ratio in the Table 2.

Table 2.List of features from EEG and EOG signals

EEG and EOG features		EEG features	
1	min	15	delta
2	max	16	alpha
3	Peak to peak	17	theta
4	Mean	18	beta
5	Absolute mean	19	delta/theta
6	SD	20	delta/alpha
7	Variance	21	delta/beta
8	Skewness	22	theta/alpha
9	Kurtosis	23	theta/beta
10	Root mean square	24	alpha/beta
11	Waveform factor	25	alpha/(theta+delta)
12	Peak factor	26	delta/(theta+alpha)
13	Pulse factor	27	theta/(beta+delta)
14	Margin factor		

4.3 Classification Results and Analysis

In this experiment, the following PSG signal combinations were used to analyze the experimental data: FPZ-CZ single channel EEG, FPZ-CZ and PZ-OZ dual channel EEG, PZ-OZ single channel EEG and single channel EOG, and FPZ-CZ, PZ-OZ dual channel EEG and single channel EOG [7].

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All the feature data are normalized to [0, 1] by Gaussian, and each kind of sample in the data is scored 7, 3, of which 70% is the training set and 30% is the test set. The balanced training samples and test samples are obtained. Then, the sleep process is divided into six stages (Wake, S1, S2, S3, S4, REM) by using nonlinear SVM and BP neural network algorithm. The classification accuracy of different PSG signal combinations and the recognition rate of each sleep stage are obtained. Table 3 shows the staging accuracy of the two models using different channel combinations in the training and testing phases.

Table 3. Sleep Staging accuracy of different PSG signal combinations

PSG Signals	Model Accuracy Rate(%)			
	SVM Train	SVM Test	BPNN Train	BPNN Test
1EEG	87.79	88.93	85.78	85.13
1EEG+1EEG	92.90	93.43	92.67	92.17
1EEG+1EOG	93.12	93.34	93.10	92.23
2EEG+1EOG	94.44	95.08	94.11	93.88

As can be seen from Table 3, the training accuracy value is very close to the test accuracy value, so the two classification models have good generalization ability. At the same time, the accuracy of multi-channel PSG signal combination is significantly higher than that of single channel EEG signal. Using the combination of EEG and EOG of FPZ-CZ and PZ-OZ channels, no matter which model is used, the accuracy rate is the highest. The test accuracy of SVM and BP neural network is 95.08% and 93.88% respectively. In the comparison of the two classification algorithms, the classification effect of SVM is slightly better than that of BP neural network.

Table 4 and Table 5 show the test accuracy of six types of sleep stage models using the combination of FPZ-CZ, PZ-OZ channel EEG and single channel EOG signal combination SVM model and BP neural network model. That is, their confusion matrix [8]. The value on the diagonal represents the number of epochs correctly identified in this stage, while the value outside the diagonal represents the number of incorrect identified epoch. It can be seen from the table that the sensitivity of the model in the wake stage (W) is relatively high, reaching 98.88% and 99.18% respectively. The learning model shows a trend of learning the data of this stage. The sensitivity of the two models in S1 stage was only 36.0% and 40.7%, which was related to the small proportion of S1 stage in the sample. Therefore, the model is difficult to learn at this stage.

Table 4.BPNN model test accuracy

	W	S1	S2	S3	S4	R	Acc(%)
W	2291	6	5	0	1	14	98.88
S1	7	31	22	0	0	26	36.0
S2	3	9	568	13	0	18	92.62
S3	4	0	18	53	12	0	60.92
S4	2	0	0	10	60	0	83.3
R	3	6	21	0	0	193	86.55
Ave	-	-	-	-	-	-	93.88

The comparison of automatic sleep staging methods is

shown in Table 6. Due to the different methods of sleep staging, feature extraction and classification, the results of each automatic sleep staging method are different. It is found that the combination of EEG and EOG signals proposed in this paper can extract the time and frequency domain features, and use SVM and BPNN classifier to automatically stage sleep. At the same time, the algorithm structure is simple and the stability of the system is better.

Table 5.SVM model test accuracy

	W	S1	S2	S3	S4	R	Acc(%)
W	2298	4	4	3	0	8	99.18
S1	10	35	21	0	0	20	40.70
S2	3	8	580	6	0	14	94.93
S3	1	0	20	59	7	0	67.82
S4	1	0	0	11	60	0	83.3
R	10	1	15	0	0	197	88.34
Ave	-	-	-	-	-	-	95.08

Table 6. Comparison of results of automatic sleep staging methods

Study	Signals	Method	Acc(%)
Ref.[10]	1EEG	DWT+BPNN	85.81
Ref.[9]	2EEG	DWT+SVM	85.72
Ref.[7]	1EEG+1EOG	1D-CNN	91.00
Ref.[2]	1EEG+1EMG	SampEn+SVM	92.94
This Study	2EEG+1EOG	TD+FD+SVM/BPNN	93.88 /95.08

5.CONCLUSION

In this study, an automatic sleep staging method is proposed, which includes signal preprocessing, feature extraction and machine learning algorithm classification process. Four different PSG signal combinations and two classification algorithms are used in this method, which has a good recognition effect on different stages of sleep. The results show that: SVM algorithm and BPNN algorithm have the highest classification accuracy of 93.88% and 95.08% respectively for FPZ-CZ, PZ-OZ channel EEG and HEOG channel. Therefore, this method can be applied to sleep staging.

In the future research, we can add other kinds of physiological signals, such as EMG signal, ECG signal and so on. We can also use the method of deep learning to study sleep staging.

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Effects of Waste Battery Lixivium on Seed Germination and Physiological Characteristics of Rape Seedlings

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Abstract: Using rape named “zhouyou 589” as experimental material, effects of different concentrations of waste battery lixivium on seed germination and physiological characteristics of rape seedlings were researched under hydroponic conditions. The results showed that seed soaking in waste battery lixivium which concentration was 5 mg/L had a beneficial effect on germination rate and germination potential and germination index and vigor index of rape seed. When the concentration of waste battery lixivium was less than or equal to 25 mg/L, the synthesis of free proline and soluble sugar could be promoted, but MDA synthesis was repressed; Seed soaking in high concentration of waste battery lixivium could not only restrain seed germination but also hinder normal physiological metabolism of rape seedlings. All above showed that treatment in low concentration of waste battery lixivium had beneficial effect on seed germination and physiological characteristics of rape seedlings, while treatment in high concentration of waste battery lixivium had unfavorable effect on seed germination and physiological characteristics of rape seedlings.

Keywords: Rape; Soaking seeds; Waste battery lixivium; Germination; Physiological characteristics

1. MATERIALS AND METHODS

Waste Zn-Mn batteries contain heavy metals such as mercury, cadmium, lead, nickel, zinc and copper, waste batteries discarded at will seriously pollute the environment and soil, it also threatens the health of humans, animals and plants[1,2]. At present, there are reports on the effects of waste battery liquid on the survival of mice[1], crucian carp[3] and other animals, as well as on the growth of rice[4] and wheat[5], however, there are few reports on the effect of waste battery liquid on rape growth. In this experiment, the effect of waste battery leaching solution on seed germination and physiological characteristics of rapeseed seedlings was studied, the purpose of this study was to investigate the effects of different concentrations of waste cell extracts on germination rate, germination potential, germination index, vigor index and physiological status of rapeseed seeds, this could provide some theoretical basis for the waste battery to harm the growth of crops.

1.1 Materials

Rapeseed seeds (Zhouyou 589): Provided by the College of Life Science and Agronomy, Zhoukou Normal University.

1.2 Method

1.2.1 Preparation of waste battery extract

The waste battery powder of 5,25,50,100 mg was weighed separately, the powder was soaked in distilled water for 3 d, then filtered, and prepared into 5,25,50,100 mg/L of waste battery extract.

1.2.2 Disinfection and seed soaking treatment of rape seeds

To disinfect selected excellent rapeseed seeds for 20 min with 0.5% sodium hypochlorite solution, to clean the seeds and dry them. Dry seeds were soaked in 4 different concentrations of waste battery leachate for 24 h, respectively, seeds of control experiment were treated for 24 h with distilled water.

1.2.3 Germination and seedling growth of rape seed

To rinse the seeds with distilled water and place them in a petri dish with two layers of filter paper, then culture them at room temperature, replenish water daily, keep seeds moist. To set 3 repetitions per processing. Every morning at 9:00 to observe the seed germination, continuous observation of 5 d. Germination index was calculated by formula. The seedlings were cultured until 4 leaves were grown, and various experiments were carried out.

1.2.4 Experimental processing

Rapeseed seedlings with 4 leaves were divided into 5 groups with 3 repeats in each group. Group 1 was the control group and groups 2 to 5 were the treatment group, treatment group treated with 5,25,50,100 mg/L of waste battery leachate, at 9:30 a.m., leaves were sprayed with waste battery extract (treatment group) and distilled water (control group) for 5 d continuously. After treatment, the rapeseed seedlings were restored to grow for 1 d, and the same leaves of each treatment group and control group were taken for physiological index determination.

1.2.5 Determination of indicators

The methods for determining seed germination indexes are as follows: germination potential = number of germinated seeds on the third day / total number of seeds $\times 100\%$; germination rate = number of germinated seeds on the fifth day / total number of seeds $\times 100\%$; Germination index (GI) = $\sum G_t / Dt$ (The number of germinates within t days is G_t , the corresponding germination days is Dt); Vitality index = $S \times \sum G_t / Dt$ (S is mean seedling height).

The physiological indexes of seedlings were determined as follows: Determination of malondialdehyde (MDA) content by thiobarbituric acid method[6]; Determination of soluble sugar content by anthrone colorimetry[7];

Determination of proline content by acid triketone method^[8].

2. RESULTS AND DISCUSSIONS

2.1 Effect of waste battery leachate soaking treatment on seed germination rate of rape seeds for 24 hours

Table 1 Seed germination rate of rapeseed after soaking for 24 hours

Concentration of leaching solution of waste battery / (mg/L)	Germination rate under different germination days / %			
	2 d	3 d	4 d	5 d
0	56	82	95	100
5	66	89	98	100
25	48	70	88	89
50	35	90	75	80
100	20	88	40	52

The germination rate of rapeseed seeds after soaking with different concentration of waste battery was shown in Table 1. Table 1 showed that the germination rate of rapeseed seeds was higher than that of the control group under the treatment of 5 mg/L of waste battery leaching, the germination rate reached 98% on the fourth day; When the concentration of leaching solution was greater than or equal to 25 mg/L, the seed germination of rape was slower than that of control group, and the ratio of germination to control decreased significantly, the greater the concentration, the greater the impact on germination. This indicated that the low concentration of waste battery leachate (≤ 5 mg/L) could promote the germination of rapeseed seeds, while the high concentration of waste battery extract (≥ 25 mg/L) could inhibit the germination of rapeseed seeds.

2.2 Effect of treatment of waste battery extract on germination potential, germination index and germination vigor of rape seeds

Table 2 Effect of seed soaking 24 hours on seed germination of rape

Concentration of leaching solution of waste battery/(mg/L)	Germination potential / %	Germination index	Vitality index
0	82	27	72.3
5	89	31	152.0
25	70	19	76.5
50	90	32	75
100	88	30	56

The germination performance of rapeseed seeds under various treatments was shown in Table 2. It could be seen from Table 2 that the germination of rapeseed seeds under different treatments was different. Compared with the control group, the germination potential and germination index of rapeseed seeds were higher than that of the control group under the treatment of 5 mg/L waste battery extract, especially the increase of vigor index (105% increase); The germination potential and germination index were obviously decreased under the treatment of 25 mg/L of waste battery extract; Compared with the waste

battery extract treatment with a concentration of 5 mg/L, the germination potential, germination rate and germination activity were decreased under the treatment of waste battery extract with a concentration of 50 and 100 mg/L, especially the decrease of activity index was the most obvious.

2.3 Changes of malondialdehyde (MDA) content in rapeseed seedlings under the action of waste battery extract

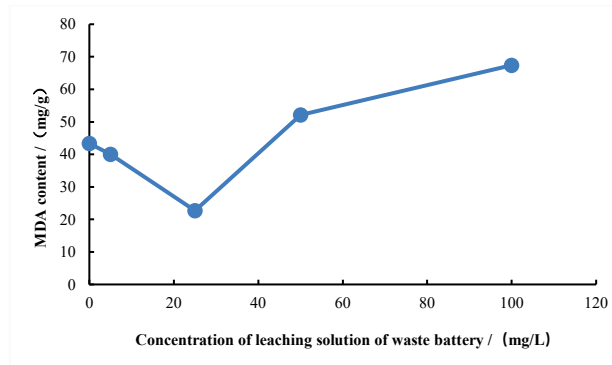


Figure 1 Effects of different concentrations of waste battery leaching solution on malondialdehyde content in rapeseed seedlings

Different MDA contents of rapeseed seedlings under different concentrations of waste battery leachate were shown in figure 1. Figure 1 showed that when the concentration of waste battery leachate was less than or equal to 25 mg/L, the MDA content decreased, which indicated that the low concentration of waste battery leachate had a positive effect on rape. It may be that the heavy metals in the waste battery had little harm to rape at low concentration, but the mineral elements and some rare earth elements in the waste battery could protect the rapeseed seedlings. When the concentration of waste battery leachate was 50 and 100 mg/L, the MDA content showed an upward trend, and the higher the concentration, the more obvious the increase. This indicated that the high concentration of waste battery leachate had caused harm to rape, and the higher the concentration, the greater the damage.

2.4 Changes of soluble sugar content in rapeseed seedlings under the action of waste battery extract

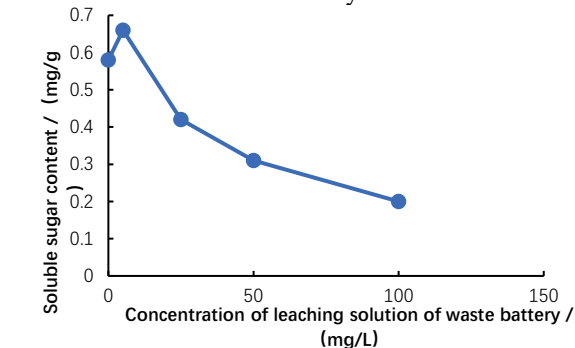


Figure 2 Effects of different concentrations of waste battery leaching solution on soluble sugar content in rapeseed seedlings

The trend of soluble sugar content in rapeseed seedlings under different concentrations of waste battery leachate

was shown in figure 2. Figure 2 showed that when the concentration of waste battery leachate was less than or equal to 5 mg/L, the content of soluble sugar in young leaves of rape increased compared with that of control; however, when the concentration of waste battery leachate was higher than 5 mg/L, the content of soluble sugar decreased significantly compared with that of control. It showed that the low concentration of waste battery leachate could promote the synthesis of soluble sugar, and the high concentration of waste battery leachate would hinder the synthesis of soluble sugar.

2.5 Changes of proline content in rapeseed seedlings under the action of waste battery extract

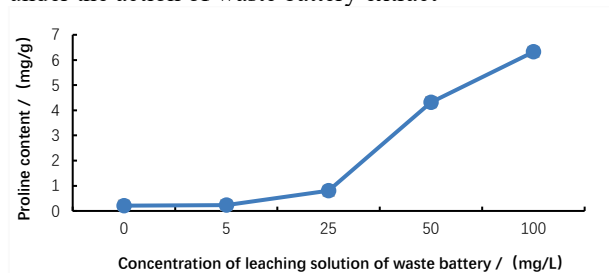


Figure 3 Effects of different concentrations of waste battery leaching solution

on proline content in rapeseed seedlings

The effect of different concentration of waste battery leachate on the content of proline in rapeseed seedlings was shown in figure 3. Figure 3 showed that the content of proline did not change significantly compared with the control under the action of 5 mg/L waste battery leachate. When the concentration of waste battery leachate was more than 25 mg/L, the content of proline increased obviously and reached a peak value at the concentration of 100 mg/L. In addition, from the growth of rape, the growth of rapeseed seedlings cultured with high concentration of waste battery extract was particularly slow, the leaves turned yellow. Obviously, the toxicity of high concentration heavy metal ions in waste battery leachate had exceeded the range of rape's own stress resistance.

3. CONCLUSION

Experimental data showed that the treatment with 5 mg/L

of waste cell leaching had favorable effects on germination rate, germination potential, germination index and vigor index of rapeseed seeds. That is, there was a promoting effect on germination. Treatment of rapeseed seedlings with waste battery extract with concentration less than or equal to 25 mg/L could promote the synthesis of free proline and soluble sugar and inhibit the synthesis of MDA; High concentration of waste cell leaching would inhibit seed germination, which was not conducive to the normal physiological metabolism of rapeseed seedlings.

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Recognition and Correction of Fitness Actions Based on Key Features of Joints

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Abstract: With people's pursuit of fitness and bodybuilding, more and more people choose to go to the gym or home fitness. How to exercise more scientifically and effectively and avoid muscle damage is one of the hot spots of scientific fitness exercise today. This paper uses Kinect to obtain human bone points, selects the distance features and angle features of key joints of 24 dimensions according to human kinematics to represent fitness actions, and then proposes a training LSTM (Long Short Term Memory Networks) using small batch sequences of similar length. The cyclic neural network is used to identify fitness actions, then factor analysis of key angle features and calculate the component score coefficients of each dimension of the principal component, find the joint points that best represent this fitness action, set the vulnerable threshold, and set the Real-time monitoring reports in China to achieve the purpose of fitness correction. Experimental results show that the extracted 24-dimensional joint key features combined with the improved LSTM algorithm can effectively identify fitness actions, and the recognition rate of this method reaches 96.08%. Setting the threshold of joint angle vulnerability, and performing exercise monitoring and analysis can make fitness more scientific and effective on the one hand, and reduce the physical damage caused by exercise on the other hand.

Keywords: Fitness Actions; Features; Joints

1. INTRODUCTION

As the people's material life improves day by day, the requirements for physical health and physical shape are gradually increasing. However, many people suffer from muscle strain and spinal damage due to insufficient warm-up and substandard movements during exercise. Therefore, how to standardize movements, reduce sports injuries, and make more scientific, effective and interesting fitness activities have become popular research topics.

The key to scientific fitness lies in action recognition and action evaluation. At present, there are several main methods for human body gesture recognition: one is to use wearable sensors^[1], such as wearing accelerometers and pressure sensors on human limbs to detect human movements, wearing Such equipment will make subjects feel a sense of burden, and if used in a fitness coaching system, the fitness experience of the exerciser will be greatly reduced. One is based on the monocular RGB camera to recognize human movements^[2], which describes human visual information and two-dimensional posture information by extracting the features of RGB images. However, the recognition of human posture based on the features of RGB images is susceptible to

interference from lighting and environmental background. Provide unsatisfactory recognition accuracy and robustness under complex conditions. The other is a depth camera represented by Kinect to give three-dimensional joint point information for human body action recognition. Common human body recognition methods based on depth information include SVM (Support Vector Machine)^[3], DTW (Dynamic Time Warping) algorithm^[4] and RNN (Recurrent Neural Network) algorithm^[5] and so on. Zhang Liying and others used Kinect combined with Unity3D and DTW algorithm to develop a Tai Chi coaching training system^[6]. Zainordin et al. proposed a method to classify actions by setting threshold distances, angles between joints, and establishing a set of rules based on skeleton and depth information^[7].

LSTM is a long and short-term memory network^[8], a time recurrent neural network, and a variant of RNN, suitable for processing and predicting important events with relatively long intervals and delays in time series. RNN can only have short-term memory due to gradient disappearance. LSTM network combines short-term memory and long-term memory through sophisticated gate control, and solves the problem of gradient disappearance to a certain extent, so it is very suitable for action recognition.

In this paper, the distance feature and angle feature of the key joint points are used to represent the action, and the LSTM recurrent neural network is trained to recognize the fitness action using the similar length mini-batch sequence of the selected features, and then the similarity match with the recorded standard template, and then the pass factor. The vulnerable joint points are analyzed and the angle threshold is set according to human kinematics. Finally, the vulnerable angle is monitored in real time on the rehabilitation system based on the Unity3D engine and reported on the UI interface, providing scientific and effective guidance for the user's fitness.

2. USING METHOD

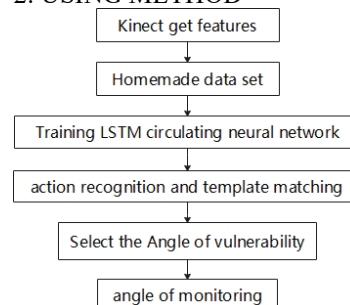


Figure 1 Key feature action recognition and correction process

This paper uses Kinect to obtain the three-dimensional

coordinates of the joint points of the human body, then calculates the distance and angle characteristics of the key joint points, trains the LSTM recurrent neural network for action recognition, and then matches the action with the standard template, and selects each action through factor analysis. The injury angle and threshold are set and monitored in real time in the established fitness system, as shown in Figure 1.

1.1 Feature extraction

The system established in this article is to recognize and monitor the six classic exercises of dumbbell lateral lift, arm forward bend, Zottman curl, dumbbell press, deep squat, and barbell snatch.

Kinect is used to obtain the three-dimensional coordinates of 25 joint points of the human body. After that, select the joint points that can describe the movement of the arm and the leg according to the kinematics principle^[14]. The 25 joint points of the human body are shown in Figure 2.

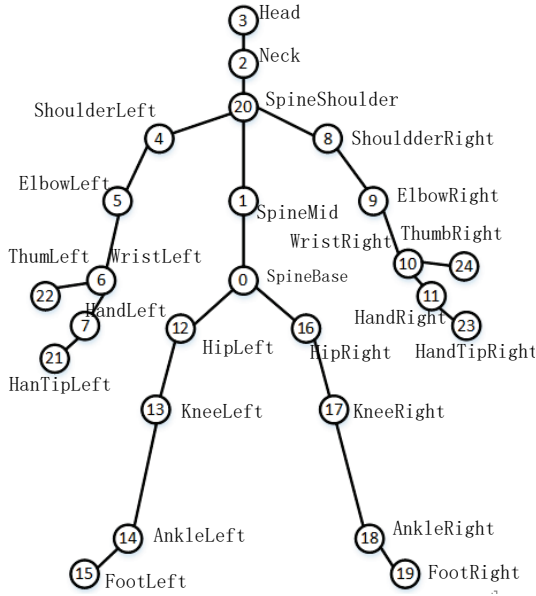


Figure 2 25 human joints captured by Kinect
Calculate the distance feature between the joint points.

$$d_l = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2} \quad (1)$$

1.1.1 Two-Dimensional Angle Calculation

Calculate the angle characteristics of the joint points. Because the rotation space of the shoulder joint is different between the lateral lifting motion and the front palmar motion, if the three-point method is used for all the joint angles according to the paper^[9], the lateral level cannot be distinguished correctly. The two movements of lifting and pressing hands together. For a joint point that can move in the z-direction of space, calculating the joint angle by the three-point method cannot accurately describe the changing trend of the joint point during the movement. The relevant formula for calculating the angle of the three-point method is as follows:

$$\vec{BA} = \{A_x - B_x, A_y - B_y, A_z - B_z\} \quad (2)$$

$$\vec{BC} = \{C_x - B_x, C_y - B_y, C_z - B_z\} \quad (3)$$

$$\alpha = \arccos \frac{|\vec{BA} \cdot \vec{BC}|}{|\vec{BA}| \cdot |\vec{BC}|} \quad (4)$$

1.1.2 Three-Dimensional Angle Calculation

Take arm forward bend as an example, when using the ACADEMIC PUBLISHING HOUSE

three-point method to calculate the joint angle, the description of the angle is not unique. As shown in Figure 3, the shoulder joint angle in the z-direction changes significantly during the process of pressing the palms together, but the two-dimensional angle calculated by the three-point method only fluctuates between 70° and 90°, so it is not sufficient as a feature representation Arm movement.

Therefore, the shoulder and elbow joints that represent arm motion are divided into two categories according to their degrees of freedom: the first category, the elbow joint can only rotate in a two-dimensional plane; the second category, the shoulder joint can rotate in a three-dimensional space. This article uses the line-surface method to calculate the second type of joint angle, the calculation steps are as follows:

$$\vec{n} = \vec{A} \times \vec{B} = (A_y B_z - A_z B_y, -(A_x B_z - A_z B_x), A_x B_y - A_y B_x) \quad (5)$$

$$\text{Angle}(\vec{a}, \vec{b}) = \arccos \frac{\vec{a} \cdot \vec{b}}{|\vec{a}| \cdot |\vec{b}|} \quad (6)$$

$$\alpha = \min(\text{Angle}(\vec{m}, \vec{n}), \text{Angle}(\vec{m}, -\vec{n})) \quad (7)$$

Among them, \vec{A} and \vec{B} are two non-collinear vectors in the corresponding plane, \vec{n} is the normal vector of the plane, and α is the angle between the arm and the plane, that is, the angle between the shoulder joint in the z direction.

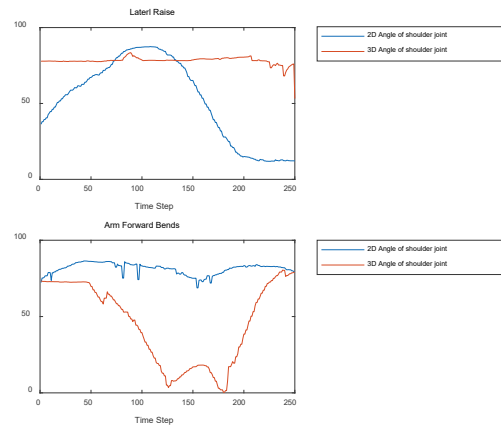


Figure 3 Different dimensions of shoulder joint angle

1.1.3 24-Dimensional Feature Selection

After solving the problem of the degree of freedom of the angle, find out the distance feature and the angle feature that best represent the above six fitness actions, a total of 24 dimensions^[13], as shown in Table 1.

In the selection of the distance feature, the Euclidean distance from the joint point to the fixed joint point 0 is selected. This distance represents the amplitude and stretchability of the action. In angle selection, angles are classified according to the degree of freedom of the joints, so that the joint angles can more accurately represent the movement process.

1.2 Action Recognition

Use Kinect combined with Unity3D to collect data of 6 professional fitness trainers doing the above 6 fitness exercises for a total of 300 times. After obtaining the three-dimensional coordinates of the human skeleton,

obtain the above-mentioned 24-dimensional joint features on Visual Studio, and then make a total of fitness exercise data sets. 1800 sample data. This data set is used for the training of LSTM recurrent neural network. LSTM is an excellent variant model of Recurrent Neural Network (Recurrent Neural Network). It inherits most of the characteristics of RNN models and at the same time solves the problem of gradient disappearance or gradient explosion caused by the gradual reduction of the gradient backpropagation process. LSTM network The structure is shown in Figure 4. The natural behavior of LSTM is long-

Table 1 24-dimensional features

symbol	Feature description	symbol	Feature description
d_1	Distance between joint4 and SpineBase	θ_{13}	joint5 Angle
d_2	Distance between joint5 and SpineBase	θ_{14}	joint8 Angle
d_3	Distance between joint6 and SpineBase	θ_{15}	joint9 Angle
d_4	Distance between joint8 and SpineBase	θ_{16}	joint4 Angle(3D)
d_5	Distance between joint9 and SpineBase	θ_{17}	joint8 Angle(3D)
d_6	Distance between joint10 and SpineBase	θ_{18}	joint12 Angle
d_7	Distance between joint12 and SpineBase	θ_{19}	joint13 Angle
d_8	Distance between joint13 and SpineBase	θ_{20}	joint16 Angle
d_9	Distance between joint16 and SpineBase	θ_{21}	joint17 Angle
d_{10}	Distance between joint17 and SpineBase	θ_{22}	joint20 Angle
d_{11}	Distance between joint20 and SpineBase	θ_{23}	joint1 Angle
θ_{12}	joint4 Angle	θ_{24}	Angle of two arms

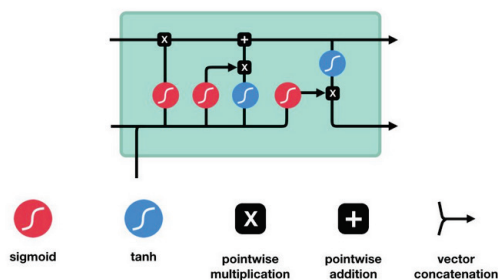


Figure 4 LSTM network structure

In this paper, the sort processing of the time sequence length of the training LSTM data set, using similar length mini-batch sequences to train the LSTM recurrent neural network, this operation can significantly improve the performance of the LSTM, because it will be between the source sequence and the target sequence. Introducing many short-term dependencies between, therefore, backpropagation makes it easier to establish communication between the source sequence and the target sequence, thereby greatly improving the overall performance of LSTM.

1.3 Selection Of Vulnerable Angle

1.3.1 Factor Analysis Of Angle Features

Perform factor analysis on the 24-dimensional features obtained by Kinect [10], select the features that need to be subjected to threshold analysis, combine with the total variance explanation table, and finally select 2 principal components. According to the general variance analysis table, you can know the value of these two principal components. The cumulative contribution rate reached 89.232%. Then the component score coefficient matrix is calculated. According to the component score coefficient matrix, we can see the explanatory power of each newly generated component for each feature. The higher the

term preservation of input. A special unit called a memory cell is similar to accumulators and gated neurons: it will have a weight in parallel to itself in the next time step, copy the true value of its own state and accumulated external signals, but this self The connection is controlled by the multiplication gate that another unit learns and decides when to clear the memory. Specifically for time series processing tasks, LSTM is very suitable for dealing with problems that are highly related to time series, such as the action recognition in this article.

component score coefficient, the stronger the explanatory power of the variable.

Taking the side-lifting action as an example, the principal component analysis is performed on the 24 features obtained by Kinect, and the explanation of the total variance obtained is shown in Table 2.

Table 2 PCA total variance explanation table

Ingredient	Total	Percentage of Variance	Cumulative contribution rate
1	14.958	62.324	62.324
2	6.458	26.908	89.232
3	1.000	4.167	93.399
4	0.636	2.652	96.051
5	0.368	1.534	97.585

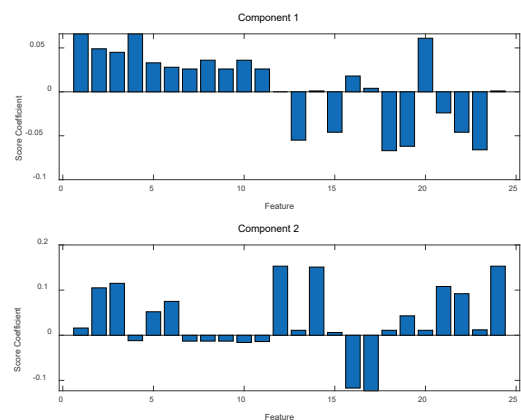


Figure 5 Histogram of component score coefficients
The cumulative contribution rate of components 1, 2 reached 89.232%, which can fully represent the 24

features before dimensionality reduction. Then calculate the component score coefficients of these three principal components, component score coefficient = factor loading/variance. Draw component score coefficients into a histogram for comparison, as shown in Figure 5.

According to the component score coefficient matrix, we can see the explanatory ability of each newly generated component for each feature. The higher the component score coefficient, the stronger the explanatory power of the variable. Therefore, for the lateral lift, the features d_1 and d_4 can best explain the principal component 1, and the features θ_{12} and θ_{14} can best explain the principal component 2. According to human kinematics, the side-lifting exercise also has the largest range of changes in joint points 4 and 5, because the main purpose of this fitness system is to avoid too small motion range to achieve good fitness effects or excessive motion range to cause muscle strain. Therefore, real-time monitoring of the angle characteristics of joints is mainly carried out. Therefore, through real-time observation of the angle characteristics of joint points 4 and 5, the highest efficiency monitoring of the dumbbell lateral lift is achieved^[11]. The most important key feature selection methods of other actions also use this method. So the most critical features of this series of actions are obtained, as shown in Table 3 below.

Table 3 Key features of fitness actions derived from factor analysis

Types of actions	Joint angle feature
Dumbbell side lift	θ_{12}, θ_{14}
Arm forward bend	θ_{16}, θ_{17}
Zottman curl	θ_{13}, θ_{15}
lift dumbbell	$\theta_{12}, \theta_{13}, \theta_{14}, \theta_{15}$
deep squat	$\theta_{18}, \theta_{19}, \theta_{20}, \theta_{21}$
Barbell snatch	$\theta_{12}, \theta_{14}, \theta_{18}, \theta_{19}, \theta_{20}, \theta_{21}$

Therefore, the fitness system monitors in real time, the human body joint points 4, 5, 8, 9, 12, 13, 16, 17, the angle

Table 4 Vulnerable angle threshold setting of key angle

joint angle	meaning	Weak	Standard	Damageable
joint4_xy	Angle of the left shoulder	0~75	0~90	90~180
joint5	Angle of the left elbow	30~45	30~170	0~30
joint8_xy	Angle of the right shoulder	0~75	75~90	90~180
joint9	Angle of the right elbow	30~45	45~170	0~30
joint12_xy	Angle of the left hip	90~180	80~90	0~80
joint13_xy	Angle of the left knee	100~180	80~100	0~80
joint16_xy	Angle of the right hip	90~180	80~90	0~80
joint17_xy	Angle of the right knee	100~180	80~100	0~80
joint4_z	Angle of the left shoulder	30~90	0~90	90~100
joint8_z	Angle of the right shoulder	30~90	0~90	90~100

Take θ_{12} as an example. When the maximum angle of the shoulder joint is less than 75° , this action is judged as a weak effect movement. If the maximum angle of the shoulder joint is between 75° and 90° , then this action is judged as a standard action. If it is greater than 90° , it is easy to cause strain on the deltoid and triceps, then this action is judged to be easily injured. Joint5 elbow joint angle range of motion is $30^\circ\sim 45^\circ$. This curling action is judged as a weak effect motion. If the elbow joint angle range of motion is $30^\circ\sim 170^\circ$, it is judged as a standard action. If the minimum angle of elbow joint angle is

on the two-dimensional plane xy and the angle between the joint points 4 and 8 in the Z direction of the three-dimensional space. Perform cubic spline interpolation on the shoulder, elbow, hip, and knee joint angles of each frame of several representative fitness exercises, dumbbell side lift, dumbbell curl, front squat, and squat. The abscissas of the graph all reach 250 frames, and then record and draw into a waveform graph, which can display the movement track more intuitively, as shown in Figure 6.

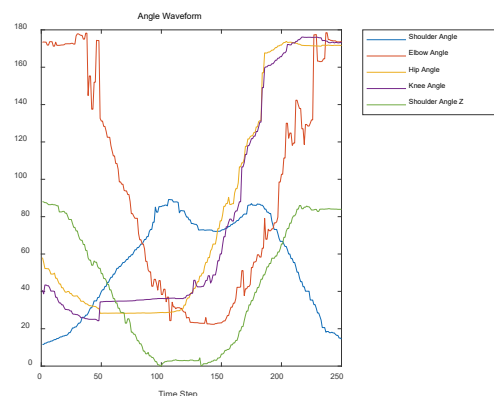


Figure 6 Track of key angle

1.3.2 Vulnerable Angle Threshold Setting

This article judges the exercise effect and susceptibility of fitness actions, and judges based on the angle of joint points, and sets the movable angle of joint points according to the range of motion of each joint. The standard movement angle is extended in a small range. Combining the suggestions of professional fitness coaches and kinematics, thresholds are set for the angles of key joints^[12], and reasonable suggestions are given to judge the vulnerability. The threshold setting for the key angle is shown in Table 4.

$0^\circ\sim 30^\circ$ In the area, it is easy to cause biceps injury, so it is judged to be a vulnerable action.

After setting the vulnerable angle threshold, the angle is monitored in real time in the Unity3D-based fitness system, and the detection feedback is given on the UI interface. If the exercise angle is less than the threshold, the UI interface prompts the user as a weak angle and needs to increase the exercise amplitude. If the motion angle is greater than the threshold, the user will be prompted on the UI interface that this action is likely to cause muscle damage and the motion amplitude needs to

be reduced.

2. EXPERIMENT AND RESULT ANALYSIS

The experimental hardware is Kinect for Windows, the computer used is LEGION Y7000P, the experimental environment is Inter(R) Core(TM) i5-9300H CPU 2.40GHz, the memory is 16.0GB, Window10 operating system, Visual Studio 2019 and Matlab 2018b. The experiment in this article first converts the joint point coordinate information collected by Kinect into defined 24-dimensional distance features and angle features, and trains LSTM using a self-made data set. According to the LSTM algorithm, the user's fitness actions are identified and matched with the pre-recorded standard fitness template. Then real-time monitoring of the vulnerable angle, and finally get the classification results of fitness movements and correction suggestions for the movements.

2.1 Self-built Fitness Data Set Training LSTM

Part of the data of the reserved data set is used to test the recognition rate of LSTM, and the remaining data is used for training. Because it is easier to analyze movement changes through numerical fluctuations, first visualize the first sequence as shown in Figure 7.

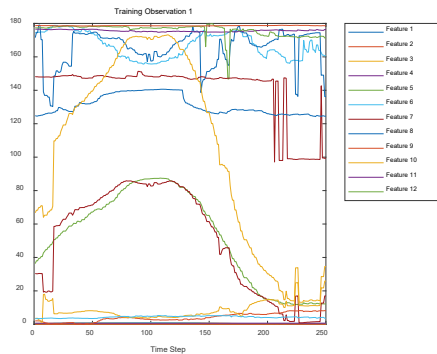


Figure 7 12-dimensional angular feature visualization of time series

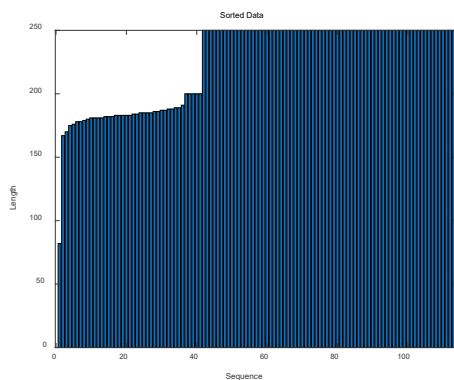


Figure 8 Sequence length sorting diagram

Table 5 The recognition rate of LSTM on the fitness test data set

The action class	Table 1	Label 2	Table 3	Table 4	Table 5	Label 6
Dumbbell side lift(1)	1	0.059	0.00	0.00	0.00	0.00
Arm forward bend(2)	0.00	0.941	0.00	0.00	0.00	0.00
Zottman curl(3)	0.00	0.00	1	0.00	0.00	0.00
lift dumbbell (4)	0.00	0.00	0.00	1	0.00	0.00
deep squat(5)	0.00	0.00	0.00	0.00	1	0.00
Barbell snatch(6)	0.00	0.00	0.00	0.059	0.118	0.823

Among them, dumbbell side lift, dumbbell curl, dumbbell press, and squat are recognized with 100% accuracy. The

Then prepare the data to be filled. Because there are many different data frames obtained, sort the sequence length in the cell array, and then use the bar graph to view the sorted sequence length, as shown in Figure 8. Choose a mini-batch size of 27 to evenly divide the training data and reduce the amount of filling in the batch, and finally input the processed data to train the LSTM.

Choose a mini-batch size of 27 to evenly divide the training data and reduce the amount of filling in the batch. Finally, input the processed data to train the LSTM. The training process is shown in Figure 9.

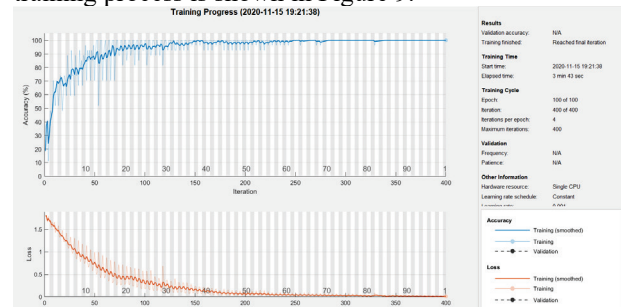


Figure 9 LSTM training process

2.2 LSTM Test Set Action Recognition

Then use the trained LSTM to perform action recognition on the test set, and the recognition result is shown in Figure 10. Among them, the front pressing of the palms was incorrectly identified as one side lift, the barbell snatch was incorrectly identified as 2 squats, and the barbell press was 1 time.

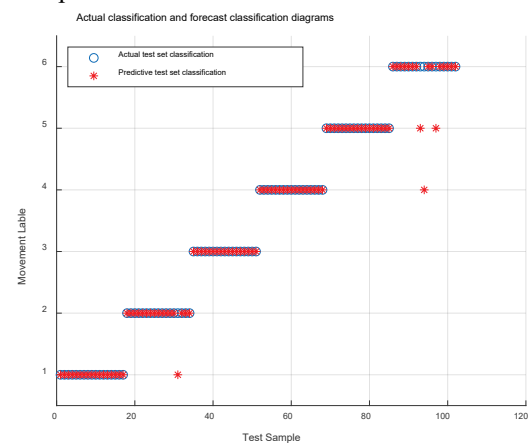


Figure 10 LSTM recognition result distribution on fitness test data set

Calculating the recognition rate of the recognition results, the recognition rate of LSTM for all actions reaches 96.08%. As shown in Table 5.

recognition rate of the barbell snatch is 82.3%, and it is recognized as a squat with a probability of 11.8%.

Because the leg motion amplitude of the barbell snatch is the same as that of the squat, it is recognized as a dumbbell press with a probability of 5.9%. Because of the arm movement amplitude of the snatch, the shoulder joint angle movement is similar to the dumbbell press, so it is more difficult to recognize. After the action is recognized, it is matched with the recorded standard template, and the similarity between the action and the template is calculated and regarded as the accuracy of the action. Finally, real-time monitoring of the vulnerable angle on the Unity3D-based fitness system has played an effect of scientifically guiding fitness movements.

3.CONCLUSIONS

This paper uses Kinect to obtain the three-dimensional coordinates of the human body joint points, and then calculates the 24-dimensional distance feature and angle feature. These features not only retain the spatial scale information but also retain the time scale information, so the actions of people of different shapes can also reach high Recognition rate. Recording a data set based on the above-mentioned 24-dimensional features, using similar length mini-batch sequences to train the LSTM recurrent neural network, and then recognizing the test set actions after the training is completed, the recognition rate reached 96.08%.

In addition, this article proposes a method based on factor analysis, using component score coefficients to select vulnerable joint points, and set the joint point angle vulnerability threshold according to human kinematics, achieving the purpose of standardizing fitness actions and reducing sports damage to the body. However, the barbell snatch arm action is similar to the dumbbell press arm action, and the leg action is similar to the squat leg action, so the next thing to improve is to extract more features to improve the recognition rate of more complex fitness exercises. In order to realize the recognition and correction of more complex fitness exercises.

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Construction of Network Teaching Mode of Ideological and Political Theory in Colleges and Universities in New Media Times

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Abstracts: In the era of new media, with the rapid development of network, network teaching and online education have promoted the reform of educational teaching methods and teaching models, and the innovation of educational ideas, contents, methods and models has become an inevitable trend in the development of higher education. In the face of the tide of digitization and networking, ideological and political theory courses in colleges and universities must seize the opportunity, use mobile learning platform flexibly, use excellent open courses rationally, establish cross-departmental and cross-professional team cooperation, strengthen the training of teachers' ability to use new media in class, set up network teaching construction fund and reward system, so as to improve the educational and teaching effect of ideological and political theory course and expand the influence of ideological and political theory course.

Keywords: New Media Age; Ideological and Political Theory; Network Teaching Model

1. DEFINITION OF RELEVANT CONCEPTS

1.1 Connotation of the New Media Age

Compared with traditional media, new media is a new form of communication and media developed after traditional media such as newspapers, radio and television. It is the form of communication and media that provides information and entertainment services to users through the Internet, wireless communication networks, satellites and terminals such as computers, mobile phones and digital TV sets, using digital technology, network technology and mobile technology. Strictly speaking, the new media should be called digital media, which has the characteristics of fast communication speed and massive information.

1.2 Connotation of the Teaching Mode of Ideological and Political Theory Course in Colleges and Universities

The connotation of ideological and political teaching mode in colleges and universities refers to the relatively stable teaching activity structure and procedure established under the guidance of certain teaching thought or teaching theory in order to complete the teaching goal of ideological and political course and guide the teaching practice of ideological and political course. Teaching mode can be said to be a bridge between ideological and political teaching theory and teaching practice. The study of teaching mode can not only enrich and develop teaching theory, but also better guide teaching practice, thus improving teaching effect.

2. PROBLEMS IN THE REFORM OF THE TEACHING

MODE OF IDEOLOGICAL AND POLITICAL THEORY IN COLLEGES AND UNIVERSITIES IN THE NEW MEDIA AGE

In the new media era, the curriculum system of ideological and political courses in colleges and universities has been gradually optimized, teaching reform has been gradually promoted, and valuable experience has been accumulated. For example, colleges and universities follow the development trend of the new era and integrate information technology as teaching means into ideological and political teaching. However, while the reform of traditional teaching mode of ideological and political theory course in colleges and universities has achieved excellent results, it also faces the problems of slow reform of teaching mode, and the space for reform and innovation is still very large.

2.1 the lag of education and teaching concept

The prevalence of network open classes, the expansion of network-assisted teaching classes and even the rise of admiration classes impact the teaching concepts and methods of ideological and political theory courses in colleges and universities. But at present, for the reform and innovation of network teaching in ideological and political theory course, a considerable number of teachers and managers hold a wait-and-see attitude or even reject attitude. Most educators and managers do not fully understand the substantive differences between the teaching of admiration courses, the teaching of network assistance and the open courses. In addition, because some ideas of network teaching are very different from traditional teaching ideas and teaching models, people's acceptance of it also needs a process.

Online teaching advocates the teaching idea of teacher-led and student-centered. In the traditional teaching mode, the authority of teachers is challenged, from the indoctrination of theory to the guide and service of teaching, and the students from passive recipients to active learners and active constructors of meaning. But some teachers think that with the popularization of online teaching, the role of teachers will be weakened, and the teaching quality of the curriculum can not be guaranteed, which to some extent reduces the enthusiasm of teachers; Some managers think that network teaching is "virtual", and question whether the workload of teachers in the process of network teaching reaches the prescribed time. In fact, network teaching not only does not reduce the task of teachers, but also puts forward higher requirements for teachers. Whether it is curriculum teaching design, online communication or the improvement of information

technology literacy, it takes more energy and time for teachers. Even some students do not adapt to the new network teaching model and still have a passive learning attitude towards curriculum learning.

2.2 Lack of Multiple Network Platforms Complementary Advantages

At present, most colleges and universities in China already have the conditions of network teaching. Most of them use free mobile learning platform and network social software. Network teaching form and teaching means appear relatively single, many colleges and universities lack the construction of network resources and platform management.

In the future, teachers of ideological and political theory courses in colleges and universities should make rational use of the functions of multiple network platforms according to purposes and teaching difficulties, give full play to their respective advantages, and make the forms of network teaching more diverse. More flexible means, more prominent effect, common service in ideological and political theory teaching.

2.3 Lack of Inter-departmental Cooperation in Online Teaching

At present, the network teaching of ideological and political theory courses in colleges and universities mainly depends on the teachers of ideological and political theory courses. Many colleges and universities have not really established cross-departmental and cross-professional teaching teams. Teachers in other departments rarely participate in the network teaching of ideological and political theory courses, and lack of cooperation between departments. And network teaching is a systematic and highly demanding work, ideological and political theory teachers have relatively limited technical ability, in the production of micro-class, website maintenance and other aspects will face technical difficulties, need computer teachers to give technical support and help. Therefore, it is necessary to set up a cross-departmental, cross-professional technical team and after-class tutoring team to ensure the smooth development of network teaching and ensure the quality of teaching.

2.4 Ideological and Political Theory Teachers Network Teaching Ability is not Strong

Many ideological and political teachers do not study and study the network teaching platform in use, do not understand and use many functions of the platform, and do not give full play to the function of the network teaching platform. In the construction of network teaching platform, many teachers fail to actively participate in the construction of teaching platform, continue to use teaching video and teaching materials that have lagged behind, and lack the ability to independently record teaching video and make micro-lessons. they can not provide the teaching content of picture and text sound according to the actual needs, and supplement the new content in time according to the theoretical development of the Party, so as to give college students a new learning experience.

In the future, it is necessary to strengthen the training of ideological and political theory teachers, improve the

ability of ideological and political theory teachers to use new media technology and network resources reasonably, and make the teaching process more in line with the acceptance habits and understanding ability of college students, in order to promote the quality of network teaching.

2.5 Lack of Corresponding Assessment and Incentive Mechanism

Many colleges and universities ideological and political theory course teaching evaluation system and incentive mechanism is not perfect, did not put forward the clear request to the network teaching, also did not give the affirmation and the appropriate reward to the teacher's work, whether to choose the network platform to carry on the teaching design, whether to use the network teaching resources such as class and so on network teaching resources, whether carries out the online examination and the online discussion activity and so on becomes the ideological and political theory class teacher's free choice. Therefore, colleges and universities need to formulate clear evaluation standards and incentive mechanisms for network teaching, and give certain workload affirmation to teachers responsible for the construction and daily maintenance of network teaching platform. Teachers who participate in information-based teaching competitions and award awards are given appropriate material and spiritual rewards, teachers who often communicate with students online and offline are given appropriate tilt to the title evaluation and more teachers are encouraged to use online teaching means.

3.CONSTRUCTION OF NETWORK TEACHING MODE OF IDEOLOGICAL AND POLITICAL THEORY COURSE IN NEW MEDIA

3.1. Flexible Use of Mobile Learning Platforms

At present, mobile phone clients push out a number of mobile learning platforms that serve teaching, such as Blue Mo Yun class, Siyuan learning platform, net college mobile learning, Jinghua mobile learning and so on. Using these mobile learning platforms to assist teaching activities in and out of class can give full play to the advantages of classroom teaching and network teaching, change traditional teaching methods and learning methods, make boring theoretical learning lively and interesting, change passive acceptance of learning into active exploration learning, and improve classroom charm and effectiveness of teaching.

3.2. Rational Use of Excellent Open Courses

At present, the network promotes a large number of excellent open courses can serve the ideological and political theory teaching, such as Superstar Erya Learning, Love course, Chinese University MOOC and other platforms have a large number of teaching video resources for teachers and students to learn, through these open quality courses, teachers can change from "teaching" as the center to "learning" as the center, teachers no longer explain each knowledge point in detail. These excellent courses are suitable for students' self-study, let students learn independently, solve the contradiction between the limited classroom teaching time and the large amount of teaching tasks, and give students certain freedom of study.

According to their own time arrangement, choose when and where to learn a knowledge point of teaching video, enhance students' autonomy, play a leading role, make teaching and research closely combined, on the basis of enhancing teacher-student interaction, help to solve students' ideological confusion and practical problems.

3.3 Establish Cross-departmental, Cross-professional Teamwork

Teachers of ideological and political theory courses in colleges and universities need to cooperate with teachers and part-time students who are proficient in computer technology, image making and network maintenance to establish a team of technical personnel at the school level to provide a strong technical guarantee for the smooth development of network teaching.

The production of teaching video, such as micro-class, requires the close cooperation of teachers in various functional departments. The teachers of ideological and political theory course are responsible for the scientific teaching design according to the teaching content, which not only controls the teaching time reasonably, but also cleverly designs the questions and answers, and modular teaching; The teacher of propaganda department is responsible for recording teaching video and editing synthesis; The teacher of the computer department is responsible for the technical packaging and deep processing of the teaching video, integrating the teaching record, courseware, animation sound effect, subtitles and so on, and setting up many small questions, asking questions in real time during the viewing process, students can continue to listen to the class after answering correctly, so that the learning process is full of rational thinking, visual enjoyment and game clearance experience, which not only increases the interest in learning, but also tests the learning effect. Secondly, the maintenance and management of network teaching platform is related to the smooth development of students' network learning activities. The network maintenance team, composed of part-time students proficient in computer technology and teachers of computer department, is responsible for the daily maintenance of the teaching website of ideological and political theory course, when there is a technical failure in the teaching website, it can be debugged and repaired immediately to ensure that students can log on to the learning website to carry out learning activities smoothly. In addition, they should do a good job of daily supervision of the network to ensure the smooth flow of campus wireless network and provide guarantee for students' network learning.

3.4. Strengthen the Training of Teachers' Ability to Use New Media

The new media, represented by multimedia computer, smart phone and Internet, has become an important carrier of ideological and political theory teaching in colleges and universities. Teachers' ability in using new media to assist classroom teaching is limited, and teachers need to be trained in the use of new media to improve teachers' teaching ability.

First of all, to strengthen teachers' training in teaching design using new media, schools should employ experts

to do a good job in training, and enhance the ability of ideological and political theory teachers to use new media for teaching design and teaching organization. Make students participate in teaching activities and better solve the teaching difficulties and complete teaching tasks. Secondly, strengthen the training of teachers to use the network teaching platform, and the Marxism Institute organizes all ideological and political theory teachers to concentrate on learning the functions of the network platform. And focus on how to use these platforms to assist teaching activities in and out of class according to the teaching content. Finally, strengthen teachers' training in information teaching competitions, we can hire some famous experts and scholars to demonstrate a class on the spot, so that teachers can understand more intuitively and vividly how to use new media technology to design courses and carry out teaching activities, to improve teachers' ability and level of new media teaching.

3.5. the establishment of an network teaching construction fund and reward system.

Colleges and universities should strengthen their support for network teaching, bring the construction of network teaching into the work system of ideological and political theory course construction, provide corresponding special construction funds and formulate a set of standard reward system, respect and affirm teachers' labor and creation, create a working environment that wants to do things, willing to do things and do good deeds, use new media and new technology to serve the teaching of ideological and political theory course, and promote the better and faster development of network teaching.

First of all, we should give some capital investment to the construction of the network high quality teaching resource system, so as to facilitate the ideological and political theory teachers and professional companies to cooperate in recording fine micro-lessons and downloading high quality teaching resources that need to be paid. Secondly, the management of the network teaching platform needs to be equipped with teachers or students who are proficient in computer technology, and give appropriate monthly allowance. Thirdly, the activities of network discussion and answering questions need to set up an after-class tutoring team with ideological and political theory teachers as the main body and part-time combination. According to the statistical data of teachers' posts and replies in the final statistics of Superstar Erya Company, rewards are given according to certain teaching workload. Finally, the opening of Weibo, WeChat public number and regular release of positive impact of online articles, and the attention and click rate of teachers continue to be high, to give the title of network teachers and appropriate awards to encourage more teachers to consciously use the new media platform to serve and lead students.

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Research on the Method of Indoor Positioning Data Preprocessing and System Optimization Based on Wi-Fi Location Fingerprint

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Abstract: At present, demand for indoor positioning systems is large. This paper designs an indoor positioning system based on WiFi location fingerprint. The system collects WiFi signals of access points (AP) and generates a fingerprint database that matches the indoor environment, the Euclidean distance between received signal strengths indication (RSSI) is used as a distance measure to determine the physical distance between points [1], and the WKNN and Kalman filter algorithm is used to get the coordinates of the points to be located. This paper mainly deals with the problem of data preprocessing and continuous positioning errors in the moving process. The former uses data smoothing and de-linearization methods to process the RSSI data; the latter uses the Kalman filter. Through testing, the system can work stably, and has high positioning accuracy.

Keywords: Indoor positioning; Location fingerprint; Received signal strengths indication (RSSI); WKNN; Kalman filter

1. INTRODUCTION

The system consists of an Android client and a computer server. WiFi signal data is collected by the client side, then written to the fingerprint database. The fingerprint data pretreatment algorithm is used to de-linearize and smoothing the data to make it reliable. When the server side receives the positioning request from the client side, the coordinates are calculated through the joint positioning algorithm using improved K-nearest neighbor matching and Kalman filter, then pass the coordinates back to the client side to realize indoor positioning. The overall architecture of the system is shown in figure 1.

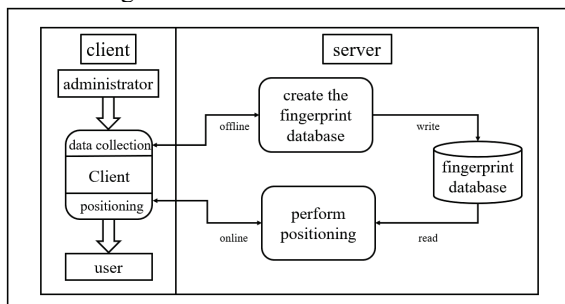


Figure 1. The overall architecture of the system

2. OFFLINE CREATION OF THE FINGERPRINT DATABASE

The fingerprint data includes: ID number, Service Set Identifier (SSID), Received Signal Strength Indication (RSSI), signal frequency, MAC Address, XYZ axis

coordinates and collection time.

(1) Data smoothing

The RSSI data collected by the Android client is affected by the complex indoor environment noise, some part of data fluctuates seriously. It is impossible to determine the RSSI value through single measurement. If multiple measurements are taken to take the mean value, the calculated mean value will deviate seriously from the real value due to the severe fluctuation of some data. In this paper, Gaussian filter is used to smooth the RSSI data.

Gaussian filter is based on the normal distribution function:

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} \exp\left(-\frac{(x-\mu)^2}{2\sigma^2}\right) \quad (1)$$

Where μ represents the average value of the sequence and σ represents the standard deviation of the sequence. The Gaussian template required for filtering can be calculated from this formula. For example, a Gaussian template size of three consists of: $f(t_0-1)$, $f(t_0)$, $f(t_0+1)$. Then use the template and RSSI data to do convolution in turn. Comparison chart of RSSI data collected from single AP 30 times in the same location before and after filtering is shown in figure 2.

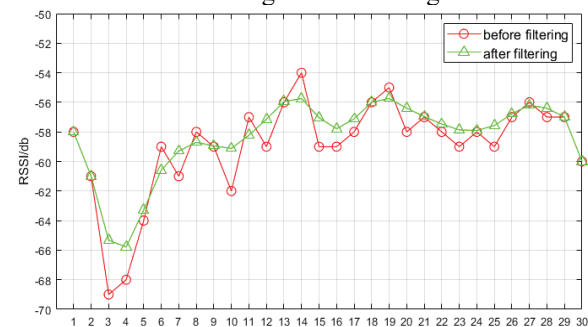


Figure 2. Comparison of RSSI data before and after filtering

The mean square error can more intuitively show the deviation of the two sets of data. Five representative AP are selected to calculate the mean square error of the data before and after filtering. The results are shown in following table 1.

Table 1. Comparison of mean square error of RSSI data before and after filtering

Status	AP ₁	AP ₂	AP ₃	AP ₄	AP ₅
Before filtering	3.26	3.24	3.56	4.32	3.14
After filtering	2.61	2.58	2.89	3.02	2.57

Obviously, the mean square error of the RSSI data after filtering is reduced. The Gaussian filter can reduce the

fluctuation of fingerprint data.

(2) Data de-linearization

Hardware device differences may cause error in positioning. Different mobile devices use different WiFi modules, encapsulation materials, encapsulation methods, resulting in significant differences in the RSSI data collected by the device. In the experiment, two mobile phones of different brands were used to collect the RSSI data of the same AP at the same time and at the same location. The experimental data is shown in figure 3. This paper uses a calibration-free, unsupervised data processing method called SSDR (signal strength difference ratio) [2] to de-linearize the RSSI data.

Numerous studies have shown that, in the offline phase, the difference in RSSI data caused by different collection devices can be described by linear changes. Assuming that under ideal conditions, the RSSI data collected by standard equipment is:

$$V^0 = (RSS_{j1}^0, RSS_{j2}^0, \dots, RSS_{jk}^0, \dots, RSS_{jN}^0) \quad (2)$$

The superscript zero indicates that the test device is a standard one, the subscript j indicates it is the j-th fingerprint data, and N indicates the number of AP. For another device, the collected RSSI data is expressed as:

$$V^{Di} = (RSS_{j1}^{Di}, RSS_{j2}^{Di}, \dots, RSS_{jk}^{Di}, \dots, RSS_{jN}^{Di}) \quad (3)$$

According to former studies, the relationship between the RSSI data collected by current device and which collected by standard equipment can be expressed as:

$$V^{Di} = a^{Di} \times V^0 + b^{Di} + \varepsilon \quad (4)$$

Change the above formula into component form, which can be expressed as:

$$RSS_{jk}^{Di} = a^{Di} \times RSS_{jk}^0 + b^{Di} + \varepsilon \quad (5)$$

Where a^{Di} is the slope and b^{Di} is the intercept. The work to be done in this paper is to eliminate the influence of the slope and the intercept. $mRSS_j^{Di}$ is the mean value of a set of fingerprint vectors, then:

$$mRSS_j^{Di} = \frac{a^{Di} \times (RSS_{j1}^0 + \dots + RSS_{jN}^0)}{N} + b^{Di} + \varepsilon \quad (6)$$

Subtract the mean value from the fingerprint data to obtain a new fingerprint data vector with the intercept removed:

$$V^{Di1} = (RSS_{j1}^{Di} - mRSS_j^{Di}, \dots, RSS_{jN}^{Di} - mRSS_j^{Di}) \quad (7)$$

In the above formula:

$$a^{Di} \times RSS_{j1}^0 - \frac{RSS_{j1}^{Di} - mRSS_j^{Di}}{RSS_{j1}^0 + RSS_{j2}^0 + \dots + RSS_{jN}^0} \quad (8)$$

The next step is to remove the influence of the slope. This paper uses the method of dividing the fingerprint data vector with the mean value then take the logarithm:

$$V^{Di2} = (\log(RSS_{j1}^{Di}/mRSS_j^{Di}), \dots, \log(RSS_{jN}^{Di}/mRSS_j^{Di})) \quad (9)$$

The above method can remove the influence of slope on the data collected by different devices. Finally, replace the RSSI data in the fingerprint database from the original RSSI data to (V^{Di1}, V^{Di2}) , and use it as the new location fingerprint data. In figure 3, the second and third charts are the comparison of the collected RSSI data of the two devices with the intercept or the slope removed.

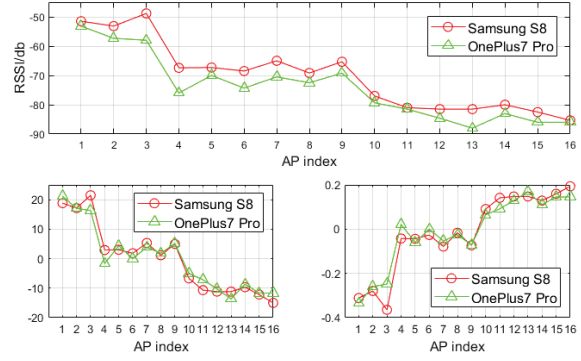


Figure3. Comparison of the location fingerprint data

3. ONLINE POSITIONING

(1) Weighted K-nearest neighbor matching algorithm

In this paper, the K-nearest neighbor algorithm (KNN) is used to get current coordinates. The KNN algorithm is a machine learning algorithm based on the distance between different feature values [3].

The detailed steps are as follows:

- 1) Load the fingerprint data set and the data of the point to be measured.
- 2) Calculate the Euclidean distance of the RSSI data between the fingerprint data set and test point data.
- 3) Select K points with the smallest distance.
- 4) Take the average of the coordinates of these K points as the coordinate of the point to be measured.

In order to improve the accuracy of positioning, an improved WKNN (weighted-KNN) algorithm is used. Based on KNN, the algorithm weights and averages the coordinates of the k points with the smallest distance, which can be expressed by the following formula:

$$(x_p, y_p) = \sum_{i=1}^K w_i (x_{FP}^i, y_{FP}^i) \quad (10)$$

Where (x_p, y_p) is the estimated value of the coordinates of the point to be measured, (x_{FP}^i, y_{FP}^i) is the coordinate of the I-th sample point in the training data set, w_i is the normalized weight of the I-th training data coordinate which is obtained by the following formula:

$$w_i = \left(\frac{1}{d_p^{FPi}} \right) / \left(\sum_{j=1}^K \frac{1}{d_p^{FPj}} \right) \quad (11)$$

Among them: d_p^{FPi} represents the distance between the point to be measured and the I-th adjacent point in the fingerprint data set.

(2) Kalman filter

In this paper, Kalman filter is used to correct the positioning error. Kalman Filter is an algorithm that uses linear system state equations and observations to estimate the optimal value of the system state. Since the observation values are affected by environmental noise, Kalman filtering can smooth the observation coordinate, so this process can also be regarded as filtering [4]. The Kalman filter algorithm detailed steps are as follows:

- 1) System state equation at time k:

$$X(k) = AX(k-1) + BU(k-1) + W(k) \quad (12)$$

- System measured value at time k:

$$Z(k) = HX(k) + V(k) \quad (13)$$

- 2) Predict the state at time k based on the state of the

system at time $k-1$:

$$X(k | k-1) = AX(k-1 | k-1) + BU(k) \quad (14)$$

3) Update the estimated error covariance of $X(k | k-1)$:

$$P(k | k-1) = AP(k-1 | k-1)A' + Q \quad (15)$$

Update Kalman gain:

$$Kg(k) =$$

$$P(k | k-1)H' / (HP(k | k-1)H' + R) \quad (16)$$

4) Combine the predicted value and the measured value to obtain the optimal state estimate at time k .

5) Update the estimated error covariance of $X(k | k)$:

$$P(k | k) = (I - Kg(k)H)P(k | k-1) \quad (17)$$

In order to verify the role of Kalman filter in indoor positioning, this paper designs a MATLAB software simulation. First, simulate a path composed of 100 consecutive coordinate points as the real path. Add Gaussian white noise to the path to simulate the path of observation measured by hardware device. The comparison of real path, observation path, path with Kalman filter is shown in figure 4:

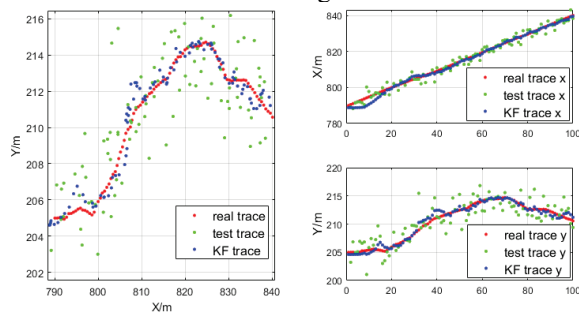


Figure4. Path and coordinates comparison

By calculating the error of a single coordinate, the positioning accuracy of the coordinate sequence with Kalman filter and the observation coordinate sequence can be compared more accurately. The comparison between the observation coordinates error and the error of coordinates with Kalman filter is shown in figure 5:

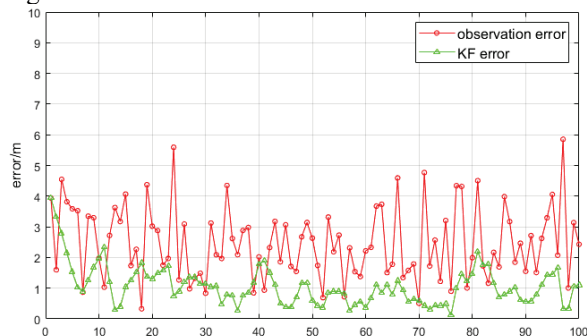


Figure5. Error comparison

As can be seen from the above figure, the error between the coordinate sequence with Kalman filter and the real coordinate sequence is much smaller. If the total error is averaged to each coordinate to calculate the average error, the average error between the coordinate sequence with Kalman filter and the true value sequence is 1.39m, and the average error between the observation sequence and the true value sequence is 2.5m. The positioning accuracy has increased by 44.4%.

4. SYSTEM DESIGN AND TESTING

(1) System design

The system is composed of an Android client and a computer server. The client is responsible for collecting WiFi signal data, transmitting it to the server and showing the positioning results; the server is responsible for fingerprint data preprocessing, positioning and storing WiFi fingerprint data. Figure 6 shows the interface of the Android app.

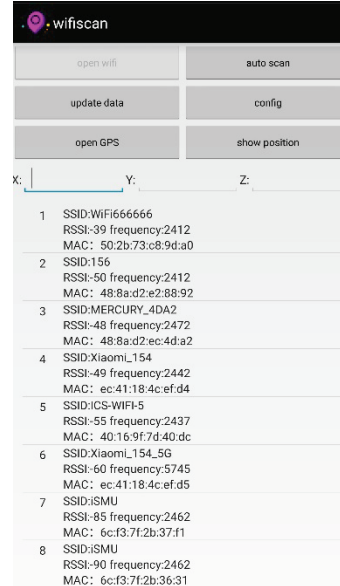


Figure6. Android app interface

(2) Build the experiment environment

The experimental environment of this paper is an inverted T-shaped indoor area composed of the corridor and laboratory on the first floor of the School of Information Engineering. This area is rich in AP. In the experimental area, set the coordinate system and determine the origin. Map the area to the coordinate system then establish the fingerprint database. Set a detection point every 1m. The environment layout is shown in figure 7.



Figure7. Experimental environment layout

(3) Positioning experiment

This paper designs two sets of experiments. The first set selects four coordinate points in the room for single-point positioning, which is used to verify the effectiveness of the SSDR data processing method in solving the problem of device difference; the second set simulates continuous multi-point positioning in a straight corridor walking. Walk at a constant speed of 1.2m/s, and perform positioning every 1s to verify the effectiveness of Kalman filter in continuous multi-point positioning.

In the first set of experiments, two experimental groups and a control group were designed. The experimental group used one device to create the fingerprint database then another device was used for positioning. Among them, the experimental group A does not consider the difference in the data collected by different devices; the experimental group B uses the SSDR data processing

method to pre-process the data and then positioning. The control group is using only one device. In the first set of experiment, the positioning experiment was repeated 5 times for 4 coordinate points, the single-point positioning results are shown in figure 8:

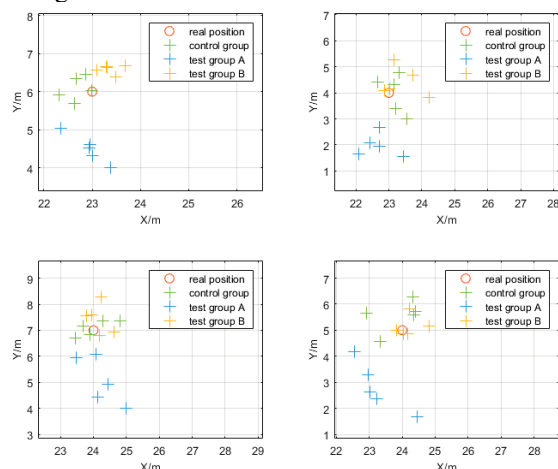


Figure 8. single-point positioning results

It can be seen from the figure that the mobile device in experimental group A use fingerprint databases established by different mobile devices for positioning, which will cause large deviations in the positioning results. The positioning accuracy of experimental group B is improved by 56.75% compared with experimental group A. It can be concluded that the SSDR data processing method can effectively solve the problem of device difference.

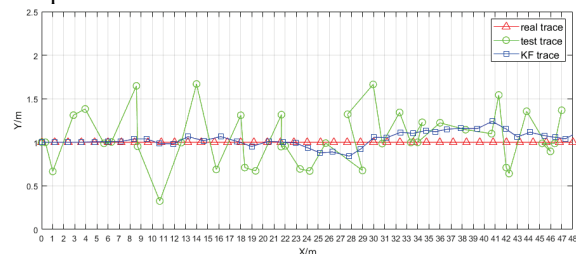


Figure9. The positioning result of continuous positioning

In the second set of experiments, a total of 40 positioning coordinates are obtained. Two groups of tests were performed. The control group only used the WKNN algorithm for positioning, while the experimental group performed Kalman filtering on the observation path. The positioning result is shown in figure 9.

The control group has an average error of 1.02m in continuous positioning. While the average error of the experimental group is 0.72m, the positioning accuracy has been improved by 42%.

It can be concluded that: the system provided in this article can complete a relatively accurate indoor positioning; the online positioning stage is divided into two situations based on the actual analysis: (1) In single-point positioning, only the improved WKNN algorithm is used. (2) During continuous multi-point positioning, Kalman filtering is performed on the positioning results of the WKNN algorithm.

4. CONCLUSIONS

Aiming at the indoor complex environment and equipment differences, this paper designs an indoor positioning system, which can guarantee high accuracy in single-point positioning and continuous multi-point positioning. Experimental results show that the positioning accuracy is high and the stability is great.

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An Analysis of The Psychological Problems in The Ideological and Political Education of College Students

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Abstract: To due to the negative influence of social unhealthy ideological trend and market economy principle, backward teaching content and method, students' own age characteristics and rebellious personality, the rebellious psychological problems of College Students' Ideological and political education are becoming increasingly serious. To solve the problem, we should start from improving the social environment, and at the same time improve the teaching and management level of the school, so as to create a new situation We should improve teaching contents and methods, stimulate interest in political learning, and implement the ideal and belief education of college students.

Keywords: Rebellious Psychology; Strategy; Reason; Ideological and Political Education

1. IMPROVE THE QUALITY OF SCHOOL EDUCATION

In our country, college students are not only an indispensable and powerful force of national power, but also high-quality talents. Therefore, the most effective method of Ideological and political education for college students who are confused in the transitional period of life is helpful for college students to establish correct ideal goals and life values before they enter the society, and help them to complete the transformation from children to children The correct transition from psychology to adult psychology leads to the correct road of life and takes the responsibility and responsibility of socialist builders actively. During the period of University, students' psychological development is not fully mature, and their enthusiasm for ideological and political education is not high, and even there is a rebellious psychology of conflict and disgust, which is very unfavorable for the development of Ideological and political education of college students. Therefore, the solution of College Students' rebellious psychological problems should start from the students themselves, create a good social environment, and start from school education. We should have a clearer understanding of how to better carry out the ideological and political education of young college students.

The school is a bridge to communicate and eliminate college students' Rebellious Psychology in Ideological and political education. It plays an important role in preventing and correcting students' rebellious psychology.

①Building a contingent of high-quality ideological and political education workers

The construction of high-quality ideological and political

education workers is not only the summary of our party's ideological and political education historical experience, but also the development needs of Ideological and Political Education under the new situation. "Autocratic ideological and political educators are the main body of Ideological and political education team, and the key point of Ideological and political education team construction and management.". Therefore, the first thing to do is to establish a strict and unified standard of professional qualification, and strictly check the entry, training and management of every ideological and political education worker; secondly, the comprehensive quality of Ideological and political workers should be strictly inspected, good moral quality is indispensable, professional knowledge and skills must also be grasped to create a highly professional education team; finally, timely To carry out competitive activities, it is the so-called no pressure, there is no motivation, the pressure of competition can make everyone in the team always keep enthusiasm for things and keep moving forward. The construction of high-quality team has high-quality talents, which can promote the elimination of adverse psychological problems in the ideological and political education of college students.

②Improve the teaching methods in schools

Ideological and political theory course is the main way to cultivate the ideological and political quality of college students. The teaching effect of Ideological and political theory course is directly reflected in whether the ideological and political quality of college students is enhanced, whether the national education policy is implemented, whether the advantages of socialism are fully exerted, and whether the development prospects of the party and the country are guaranteed by the ideological and political quality of college students The impact of. With the rapid development of network technology, teaching channels become more and more extensive. With the rapid development of network society, the teaching methods of Ideological and political education in schools should be changed timely. The traditional teaching method of "teacher talks about students" should be changed. Online tutoring teaching by using network and other media should be transformed into a teaching mode with students' conscious teacher assistance, so that a single teaching method can be more The teaching is not only to spread knowledge, but also to train the students' vision and quality of Ideological and political education, so as to achieve a positive interaction between teachers and students, and to eliminate the adverse psychology of

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Ideological and political education.

2. IMPROVING THE PROFESSIONAL QUALITY OF IDEOLOGICAL AND POLITICAL EDUCATORS IN COLLEGES AND UNIVERSITIES

In the classroom of Ideological and political education in universities, it is very important for teachers to grasp the opportunity, means and methods of teaching in time and effectively, pay attention to the psychological characteristics of different students, teach students in accordance with their aptitude, and carry out targeted ideological and political education.

① Teachers improve their knowledge literacy

Only when we educate others with our own actions, we will listen to them. We will not accept the verbal admonition. This shows that if teachers want to guide students on the right path, they must set an example, and require students to meet the standards at the same time. It is difficult for students to accept empty admonition. This requires teachers to give full play to the role model of teaching and educating people, transfer knowledge to students from the shallow to the deep, pay attention to students at all times, and solve the learning and life problems encountered by students in a timely manner [18]. Actively study and respond to the national policy, through learning more knowledge of different research scope, integrating the content of Ideological and political education, lead students to learn independently. Teachers can not "ask three don't know". It is not only students who actively strive to learn scientific and cultural knowledge, but also teachers should "live and learn". Teachers in the new era should not be "old scholars", but have the ability of excellent professional knowledge and the flavor of the times. They should pay attention to the national current political hot spots and the changes of the international situation. Only by setting a good example image of the students themselves can the students be willing to follow the guidance of the teachers and have an interest in Ideological and political education.

② Pay attention to teaching students according to their aptitude

On the basis of improving self-quality, teachers should teach students according to their aptitude, grasp and pay attention to students' personality differences and psychological characteristics in time, have a clear understanding of different students, and have a systematic solution to the reception and digestion of knowledge according to the psychological characteristics of different students. "To do a good job in Ideological and political education, teachers should follow the working law of Ideological and political education, the law of teaching and educating people, and the law of students' growth" [19]. Universities are the period when students' curiosity and competitiveness are most vigorous. Students' independent consciousness and self-interest are enhanced, and they are eager to be affirmed by teachers and eager to learn and live in an adult way. Teachers should attach importance to emotion Teachers should maintain their own personality charm, set good examples, keep close contact with students, pay attention to the spiritual

communication with students, and gradually weaken and eliminate students' Rebellious Psychology in Ideological and political education course.

3. CULTIVATE STUDENTS' INTEREST IN LEARNING

① Strengthen the education of ideals and beliefs

Ideal and belief education is in the primary position in Ideological and theoretical education. Only with good ideals and beliefs can one feel grateful for the country and society, and be stricter with his life requirements. College students are the builders of the motherland and should have the responsibility to realize the national rejuvenation. The education of ideals and beliefs not only enables them to have correct values, but also makes them firmer in their life goals and strive for them. Ideal and belief education is not only to let students establish a correct ideal, but also to actively inherit and carry forward the excellent traditional culture of the Chinese nation, "strengthen the" four self-confidence ", deepen the study and education of the history of the Communist Party of China, the history of the people's Republic of China, the history of reform and opening up, and the history of socialist development." the most effective way to strengthen the education of ideals and beliefs is to let students practice teaching, only let students personally Participate in the national and social construction, cultivate their sense of social service, they can better integrate into the society, pay attention to the people's livelihood, the sense of responsibility of building the motherland will be enhanced, will have a higher ideal goal, so as to solve the students' Rebellious Psychology of Ideological and Political Education course.

② Cultivate interest in political learning

Psychology believes that interest comes from needs. Only when the needs meet the requirements, higher-level needs and pursuit will be generated, and these needs will stimulate people's interest in more efforts and active exploration. In the ideological and political education, to really understand the needs of college students can stimulate the germination of students' interest. To stimulate students' interest in learning politics, teachers' effective guidance is very important. The friendly relationship between teachers and students can play a role. Therefore, teachers should timely and actively communicate with students on an equal footing. Only when they know the inner needs of students and let them feel the respect of adults, students naturally have a good impression on teachers, especially for those who like teachers. At the same time, teachers should also pay attention to emotional teaching and encourage students to actively participate In order to enhance students' sense of achievement and stimulate their interest and desire for political learning, we should pay more attention to the teaching activities and express their affirmation of the achievements. Ideological and political education itself is very practical and flexible, combined with social hot issues, into the textbook knowledge, so that students always maintain a strong curiosity and enthusiasm for politics.

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The Significance of Chorus Teaching in Primary and Secondary Schools

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Abstract: At present, our country has put music into the ranks of high school entrance examination, because music is an important means to develop students' morality, intelligence, physique and beauty. Chorus teaching is an important part of music curriculum, so as an important part of music education, the normal development of chorus class is conducive to improving students' music comprehensive quality, improving students' humanistic quality, and promoting the harmonious development of society. Especially for the children in primary and secondary schools, chorus can cultivate their collectivism concept and establish a correct world outlook. It can be said that chorus can play a very important role in children's life development. Therefore, only by deeply understanding the significance of chorus teaching, teachers will pay more attention to chorus, and will strive to teach this course well, and students will pay more attention to this course, so as to achieve the purpose of our education. With this, music education in China will be improved.

Keywords: Chorus Teaching; Primary and Secondary Schools; Normal Development

1. OVERVIEW OF CHORUS

1.1 Current situation of chorus development

In Some developed countries such as Europe and the United States, chorus has long been integrated into people's lives. With the continuous development of China's choral music industry, more and more primary and secondary schools are attaching more and more importance to choral music. Compared with the music education curriculum in 2001, the weight of choral teaching in the Compulsory Education Music Curriculum Standards in 2011 has obviously increased. However, compared with the development level of chorus in European and American countries, it is still far behind. There are still some problems in the implementation of chorus and its development is not perfect enough. In reality, many teachers do not know much about the meaning of chorus curriculum. In the chorus class, many music teachers turn the chorus class into a simple chorus class. No matter urban teachers or rural teachers, they have no distinction of voice parts and do not let students truly experience the charm of chorus. The real reason is that some music teachers do not know much about choral teaching. Without effective methods, students cannot learn choral singing skills and can only sing in the simplest way. Therefore, the choral singing class is turned into a chorus class.

1.2 The status of chorus teaching in primary and secondary schools

In the music education of primary and secondary schools, choral teaching plays a very important role and is an indispensable part of music education. Since primary and middle school students are in an important period of physical growth and world outlook formation, primary school to junior high school is an important period for the growth of every student. Long-term development of chorus teaching can not only cultivate students' sentiment, but also exercise their ability of coordination and response. What's more, students can realize the importance of working as a team, which can enhance their sense of responsibility. Therefore, it is of great significance for students to carry out chorus courses regularly. In order to improve the level of chorus in China and the overall cultural quality of students, the author believes that as music teachers, they should have the responsibility to learn chorus knowledge, constantly improve their own musical quality, dare to update, and should pay more attention to the meaning of chorus courses rather than the simple form. Although primary and middle school students have some difficulties in understanding and learning chorus, if we can carry out chorus teaching for a long time and cultivate students gradually, students will also master chorus gradually, which is conducive to the improvement of students' musical ability. Therefore, music teachers in primary and middle schools should take some measures to strengthen the choral teaching of music classes in primary and middle schools. The following author from two aspects to talk about the significance of the development of choral music curriculum, how to effectively strengthen the development of primary and secondary school choral music curriculum.

2. SIGNIFICANCE OF REGULAR DEVELOPMENT OF CHORUS COURSES FOR PRIMARY AND MIDDLE SCHOOL STUDENTS

2.1 Regular choral teaching in primary and secondary schools is conducive to the cultivation of students' musical aesthetic ability and the improvement of their musical accomplishment

The essence of music is truth, goodness and beauty. Music is produced by the vibration of objects, through the transmission of material, human beings through their own sensory organs to hear. Music materials consist of sound materials with certain range, time value, timbre and intensity, reproducing vivid artistic images by means of timbre, mode, beat, rhythm, melody, orchestration and harmony. This is music, which can enrich human imagination, cultivate human sentiment and exercise human consciousness.

In Choral and Conducting, the conductor must keep his mind clear, his movements precise and his emotions rich.

This is the requirement for the commander. As a student under the command, all organs should be activated at the same time in coordination when singing the chorus. They should not only sing, but also follow the gestures of the conductor with their eyes. In addition, they should make accurate judgments quickly with their brains, reflect and respond to the information given by the command post. This can greatly exercise students' thinking ability and physical coordination ability. Therefore, this requires students to be able to make a quick response to every tiny movement made by the conductor and the meaning they want to express when they sing the chorus. After a long time of training, such a response can not only balance the development of students' brain, but also achieve a training to develop students' intelligence, killing two birds with one bird.

2.2 Normal choral teaching in primary and secondary schools can enhance students' sense of collectivism and cultivate their noble sentiments

Choral singing is a collective activity that requires every student in the class to participate in it. Every student is a member of the chorus. In the process of chorus, members are divided into several groups for chorus. When singing a song, each voice can only sing its own melody part, requires division of labor cooperation. Although it is a division of labor cooperation, but it does not mean unrelated. It is a kind of group activity, so the pursuit is the unified timbre, unified speed, unified breath and emotion. All aspects have to reach a high degree of unity to sing a beautiful choral song. Team members are required to cooperate and listen to each other. Therefore, it requires a high level of collective consciousness among team members.

2.3 Normal chorus teaching can enhance students' patriotic feelings and establish a correct outlook on life

As we all know, music can cultivate people's sentiment and exercise their will, and chorus can cultivate students' noble sentiment of patriotism and love of the people. It is an important period for students in primary and secondary schools to establish a world view. How to guide students to establish a correct outlook on life and world view in a correct way is very important. Of course, in the chorus class, students can understand through the chorus: how the revolutionary martyrs with flesh and blood for today's happy life, how to protect our motherland, protect our happy life today. For example, "Defend the Yellow River". "Defend the Yellow River" is one of the great works of The people's musician Xixinghai. It is a chorus widely spread by the army and the people during the Anti-Japanese War. The song has a broad mass character. This choral song is sung in chorus and in rotation. In this chorus, we can vividly see the magnificent scene of the guerrillas fighting for the defense of the whole China with their local guns and foreign guns on the smoky battlefield of Anti-Japanese War. In this chorus, students can understand the scenes of the Anti-Japanese War and know the heroes' firm belief in the victory of their anti-japanese children. In the future on the road of learning, a profound impact on their patriotic ideology and morality. The normal development of chorus teaching in primary and secondary

schools is conducive to the cultivation of students' patriotic feelings and the establishment of correct values of life.

2.4 Regular chorus teaching can cultivate students' self-confidence and carry out aesthetic education

Habitually, we divide our life into four stages; The ignorant childhood, the vigorous youth, the steady and tenacious prime of life, and the greying old age, each stage has some character characteristics. For junior high school students who have just passed through their ignorant childhood, music is an awkward course. Because just entered the youth period of students, personality is more shy shy. If a student is asked to sing a solo in class, the student who is called will either be afraid to sing or speak in a low voice, for fear that he will be laughed at for not being able to sing well because of his rising self-esteem as a junior. So chorus is very important at this time, at this time chorus can solve these embarrassments. The chorus is about singing together, every voice will be mixed together, no matter you and me, students will not feel inferior because of fear to run away and sing badly and dare not to make a sound. The class will be better than the solo.

3. HOW TO CARRY OUT CHORUS IN PRIMARY AND MIDDLE SCHOOLS

3.1 Teachers should strengthen their own knowledge literacy

The process of teaching is the process in which teachers teach and students learn. Teachers are the guides of students' knowledge learning, and it is the duty of every teacher to guide students to learn knowledge correctly. Chorus is an important part of music in primary and secondary schools, as well as a difficult part in teaching. However, at present, music teachers in our country are relatively unfamiliar with the knowledge of chorus, and the teaching process is relatively vague and vague. There is no purposeful and targeted teaching. In particular, in the teaching process, as the guide in the classroom, to do, the ear to listen, listen to pitch, pitch, harmony. Eyes to see whether the students are serious. The conductor gestures should be correct, so that the students can get what they want to express during the chorus. Therefore, teachers play a very important role in the teaching of choral music. Therefore, the author believes that as a music teacher in the new era, he/she can use his/her spare time to learn choral knowledge and has the responsibility and obligation to improve the teaching ability of choral music, no matter urban teachers or rural teachers.

3.2 Cultivate students' interest in chorus

According to the Music Curriculum Standards for Compulsory Education (2011 edition), the main purpose of offering music courses in primary and secondary schools is to cultivate students' interests and hobbies. However, for various reasons, many students are not interested in chorus and find it difficult to take it. As for how to develop the course of choral teaching in the future, the author summarizes the following suggestions for reference.

First, choose the right choral repertoire. Many students do not like choral songs, because the students do not like

choral songs, or the tune is not suitable. Choosing the right chorus song can first strike a chord with students in the first place, and once it strikes a chord with students, it will stimulate their interest in singing. Second, create musical situations appropriately. Primary and secondary school students are in the development period of world outlook, and they are curious about many things. In the teaching process, they can create music scenes to let students exert their image force to the utmost, thus attracting students' attention and stimulating their interest.

3.3 Carry out more activities or competitions related to campus chorus content

From the role of choral singing, we can know that choral singing can not only cultivate sentiment, can enhance the sense of teamwork, but also can cultivate students' patriotic sentiment. Chorus course is an important part of music course. Of course, students can learn about choral singing in music class and get to know choral singing. But I think if you want to develop chorus better, you can't just learn from the classroom. Instead, the essence of choral singing should be brought into play in after-school life. In this regard, many European and American approaches are worth advocating. For example, the school regularly carries out activities or competitions about chorus content. The content of the competition is based on the class. All students are required to participate in chorus rehearsal in their spare time. In this way, the chorus level can be improved, and more importantly, everyone can participate

in it.

4.CONCLUSION

In short, choral teaching is an important part of music teaching in primary and secondary schools. Long-term development of choral teaching will be of great help to children's noble sentiment, team spirit and patriotic emotion. However, at present in Our country, the role of chorus, a bright pearl in the treasure house of human music culture, has not been understood by the majority of teachers and students. Do not understand the characteristics of choral art, choral social value role, and choral education function. However, the teaching of choral music is only one-sided, far from the advanced choral music level of European and American countries.

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The Informatization Construction of University Archives in the Era of Big Data

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Abstract: With the progress of the Internet, information construction plays an important role in the process of archives management in colleges and universities. Only by strengthening the construction of Informatization can the archives management of colleges and universities meet the needs of teachers and students and provide them with better services. With the development of network technology, the construction of modern informatization extends to the process of archives management in colleges and universities. With the rapid expansion of the scale of colleges and universities, the traditional archives management mode has been unable to adapt to the development of The Times. Therefore, the management form and service content of archives in colleges and universities need to use the construction mode of informatization.

Keywords: Big data era; University archives; Informatization

1. THE SIGNIFICANCE OF UNIVERSITY ARCHIVES INFORMATIONIZATION CONSTRUCTION IN THE ERA OF BIG DATE

File management information can improve the degree of office automation. At present, with the development of the network era, the management of electronic documents can be more information. This can make the archives management in the process of information management, compared with the traditional paper file has a better advantage, promote the traditional archives management has a better service. We can input the corresponding electronic information in the process of automatic office system, and carry out the realization of the corresponding identification, archiving, indexing and other information, so as to improve the efficiency of file management, promote the university file work to the construction of information. Therefore, university archives must proceed from the overall educational goal of the school, carry out teaching and service education, and create good conditions for the development of archives work^[1].

The information construction of archives can effectively regulate the resources of digital information. Due to the diversity of human social activities, the information and knowledge recorded in archives are also extremely rich, which can provide a wide range of reference for future generations. Archives are the first - hand materials that must be referred to for people to look up past situations and study the development and law of things. This is other literature material incomparable. With the continuous expansion of the scale of colleges and universities, the archives management of colleges and universities has become more complex. Therefore, it is necessary to

standardize the management of the digital construction of archives so as to provide effective information archives. With the development of the era of big data, a database of archival information resources can be established in the form of big data to provide teachers and students with certain consulting work. Therefore, it is necessary to provide a unified platform for the information construction of archives in colleges and universities through some technologies, so that each archives can be classified effectively and managed in a standardized way, and the quality of work services can be guaranteed and improved.

The archives of colleges and universities objectively and truly record the functional activities of the school, such as teaching, scientific research, party and government management, and the historical track of the development of colleges and universities, which is an essential source of information for optimizing the services of the school. The unique archives resources of colleges and universities are the precious wealth of the construction and development of colleges and universities. With the development of The Times, the scope of information construction in colleges and universities should not only be applied to the teaching process, but also the benefit of college archives as information resources should be brought into play. It can adapt to the development trend of informatization, promote the informatization construction of university archives and realize the sharing of resources. The one-time information income can be used to consult and sort out the information among various departments, so that the information resources play a huge advantage in the process of archives management in colleges and universities, and improve the effectiveness of archives management in colleges and universities.

At present, there are various problems in the construction of archives informatization. On the one hand, the task of archival information construction is relatively heavy, especially for the existing files to organize the corresponding data, which requires for some text, audio, photos need to be converted into electronic files, thus increasing the complexity in the process of archives management. On the other hand, the management of archives informatization has a high requirement for team construction, and staff members need strong business knowledge in view of some computer technology and information judgment ability. Only through the professional training of some excellent talents can we realize and satisfy the management mode of archives informatization. Therefore, the department of archival information arrangement and management is faced with great difficulties, which requires colleges and universities

to pay attention to the construction of archival information in order to improve the quality and efficiency of service.

2. THE IMPORTANT MEASURES FOR THE INFORMATIONIZATION CONSTRUCTION OF UNIVERSITY ARCHIVES IN THE ERA OF BIG DATA

First of all, the construction of archives informatization in colleges and universities needs to use modern technical information methods to manage archives, so as to promote the construction of archives informatization in colleges and universities. Therefore, administrators of archives in colleges and universities need to pay attention to information construction and play an important role in archives management in colleges and universities. Especially in the process of changing the corresponding thinking, it can establish the awareness of modern archives management, seriously look at the advantages of the information construction of university archives in the network era. At the same time, we should strengthen the archives management professionals in colleges and universities, absorb a part of the professional ability and professional quality of the archives of high compound talents, strengthen the information construction of the work of guidance and supervision, to provide effective security for the archives of colleges and universities information security^[2].

Secondly, the construction of archives informatization in colleges and universities mainly takes the information of archives resources as the core, focusing on the digitization of the paper version of archives and the current management of electronic documents. Therefore, it is necessary to expand the development and utilization of archival information resources in the process of network construction, and to realize office automation in the process of archival photos and digital retention. The development of information technology and Internet platform has brought good opportunities for the improvement of the work efficiency and quality of archives management in colleges and universities and the realization of its value. Therefore, it is necessary for colleges and universities to pay attention to the construction of the information platform of archives management to provide good technical support for the realization of archives value in colleges and universities. This needs to establish some archives information management system, under the constraints of the system to achieve the standardization of archives management, do a good job in the unified filing of electronic documents. We can form a set of institutional patterns in the scope, time and quality requirements of archiving, which can provide effective guidance for the realization of the time to access files and real records.

Finally, the realization of networked archives management in colleges and universities is to provide information services for teachers and students. It is necessary to make full use of the campus network to do a good job in the collection, arrangement and management of archives and statistical work, establish a series of standardized archives database, so as to achieve the network of archives management. Managers from the archives management department can carry out the ACADEMIC PUBLISHING HOUSE

corresponding reference through the network, so as to achieve one-stop service in the campus process, effective for each department can extract the corresponding archives management. This can not only ensure the information sharing between networks, but also realize the archive management of network resources, and realize the comprehensive management of archives. The information construction of archives aims to improve the level of archives management, realize the remote input of paper and electronic archives information, and the remote access and utilization of catalogue-level archives information. It plays an important role in improving the school work efficiency and education quality and maintaining the real history of the school.

In a word, the archivists should not only collect and sort out the archival materials, but also be able to dig out the good practices that have guidance and reference significance to the current work of the school, and combine them with the current work organically, so as to accelerate the transformation of the school. Therefore, it is necessary to make full use of various technologies of big data on the Internet to provide effective guidance for the information construction of archives in colleges and universities. We should establish a standardized digital archive, realize synchronous archiving of electronic files and paper files, and provide great convenience for teachers and students. We also need to make use of certain management means and management method innovation to do a good job in the information management of the archives of colleges and universities in the new era, so as to provide effective foundation and guarantee for the archives cause of colleges and universities.

3. CONCLUSION

In a word, the management of archives is an important content in the management of colleges and universities. The construction and development of colleges and universities need to adapt to the development of The Times in the process of information construction. Only grasp the effective measures in the process of information construction can provide effective guidance for the realization of the construction of university information. Therefore, in the process of modernization of archives management, the establishment of scientific and standardized archives management system and management mode is an important content to achieve a new level of archives management work in colleges and universities. At the same time, we should make full use of the advantages of modern technical means and information construction process, and give full play to the integrality and initiative of file management staff. In the process of archives management and filing, we need to effectively understand and learn information knowledge and equipment, master the problems in the archives management work of colleges and universities, and get timely solutions, with quality services, accurate positioning to achieve and meet the needs of teachers and students of colleges and universities.

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On Intellectual Property Law in The Codification Movement of Civil Law

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Abstract: The codification of intellectual property rights is the inevitable result of the civil code movement, and also a reflection of the continuous improvement of China's legal system. Starting from the current situation of codification of civil law, this paper briefly analyzes its inevitability, and puts forward personal opinions on the development of codification of intellectual property law.

Keywords: Civil Law; Codification Movement; Intellectual Property Law

1. INTRODUCTION

The integration of civil code and intellectual property law is the only way to improve civil law. China's current intellectual property law in the development process mainly includes two parts, including the integration of the content and the civil code, the continuous improvement of the intellectual property law system and the construction of an independent code.

(1) Economic inevitability

With the continuous improvement of China's economic level and the acceleration of economic system reform, fundamental changes have taken place in people's daily life. The rapid economic growth means that the original legal system must be properly optimized and adjusted to achieve the effect and purpose of matching the economic system, so as to provide strong legal guarantee for the sustainable development of China's economy. Law itself has the basic characteristics of compulsion. The matching of law and economic development is a kind of restriction and norm to the market economy. At the same time, only under the control of law can China's economic development maintain a rapid speed. If we only rely on the "spirit of contract" to restrict the market economic behavior, it will not only be unable to achieve "economic freedom" in the real sense, but will breed chaos and lead to the destruction of stable economic order. Therefore, the establishment of civil code is the inevitable requirement of China's economic development.

(2) Social inevitability

Driven by economic factors, China's social environment has undergone essential changes, and the functions of the government must be changed accordingly. The pursuit of democracy and fairness has become an inevitable trend. At the same time, with the continuous improvement of the people's comprehensive quality level, democratic consciousness and legal concept have been deeply rooted in the hearts of the people. It has become a normal phenomenon to choose legal means to protect their legitimate rights and interests, and this way is more easily accepted by the people. From a certain point of view, the civil law system mainly undertakes the responsibility of

adjusting the relationship between equal subjects. Civil law is essentially a law serving the people and a way to embody the superiority of China's system. Because of this, the state always regards improving the civil law system as the basic task, and constantly innovates and adjusts the civil law according to the changes of the social environment, so as to ensure that the civil law system can keep up with the development trend of the times. From the perspective of effect, civil law is a kind of restraint and management mode to our citizens, and is the basic condition to ensure social order. Therefore, the codification of civil law is not only the necessity of social development, but also the inevitable result of political development. [1]

(2) Legal inevitability

The law does not exist in vain, but needs to depend on the state to exist and serve the country and the people. Therefore, civil law exists in every country. Throughout the world, countries with different levels of development have obvious differences in the degree of perfection and development of civil law, but the common point is that the improvement of civil law will be recognized by all countries. The maturity of a civil law is not overnight, but a long-term and arduous task. The mature civil law must exist in the form of codification. In the early stage of the founding of the people's Republic of China, China's laws were formulated by referring to developed countries such as Europe, the United States and the Soviet Union, and made corresponding adjustments and Optimization in combination with the basic national conditions and actual situation of our country. There are many defects and loopholes in the early stage of the establishment of civil law. With the continuous development of the society as a whole, China's civil law has always been in a state of continuous improvement and has been realized. The transformation process from written law to code law means that the service function of civil law can be further realized and bring more convenience to the masses. In addition, with the promotion of social development, today's law has already undergone essential changes. The significance of the existence of law is not to provide services for a certain class or a group, but to serve the whole people, which means that the audience of the law will be more extensive. At the same time, with the continuous improvement and growth of the people's legal consciousness, it has become a normal phenomenon to learn and find laws. When the civil law exists in the form of code, it will further simplify the process and provide more convenient legal inquiry time for the people, which can not only speed up the popularization of civil law, but also truly serve the people, and the codification of civil

law itself is a manifestation of the development of law to a certain height. [2]

2. THE DEVELOPMENT PATH OF INTELLECTUAL PROPERTY LAW IN THE PROCESS OF CODIFICATION OF CIVIL LAW

(1) Integration of content and civil code

Intellectual property law is a "new type" law produced after the social development to a higher level. It can be traced back to England in the 17th century. At that time, the intellectual property law had only a "rudiment", the system was not perfect, the content was not rich, and it needed to rely on the British legal system to support its own development. After entering the 19th century, some European and American countries began to compile civil codes gradually, but most of them carried out this work on the basis of Roman law, that is, "things are the objective subject, the ownership is the core of the system, and the real right and creditor's rights are the basic contents". Intellectual property rights are not intangible property rights. There are essential differences between them, which is a remolding of traditional property rights. In the process of realizing the integration of intellectual property law and civil code, China can consider the following three ways: one is the incorporation. The incorporation approach is relatively thorough, which is a direct integration of intellectual property law and civil code. This approach has a long history in the world, and neighboring Russia has directly adopted the incorporation approach. The second is hybrid. Different from the inclusion type, the blending type is more "gentle", emphasizing the integration of intellectual property content and traditional property right content. It is necessary to achieve seamless convergence, and to seek common ground while reserving differences. Neighboring Mongolia has adopted this method. Third, linked. The linking mode is to summarize the existing contents in the civil code, integrate the contents related to "intellectual property rights" together, and deal with this part of the content by independent law, "Italian civil code" is adopted in this way. [3]

(3) Intellectual property law as a separate code

From the perspective of social development, any law will face great changes in different periods, and with the acceleration of social development, the development speed of law itself will also increase. For intellectual property law, it has always been in a "dynamic" state since its birth, but this process can not be achieved overnight, and needs a long-term and gradual development process. As far as the current development of intellectual property law is concerned, the standardized application of intangible property rights as abstract state has been recognized in many fields, especially in the field of literature. From the early copyright to the present technological patent right, the figure of intellectual property law can be seen. As early as the middle and lower stage of the 19th century, the systematic development trend of intellectual property law was gradually obvious, and in this stage, patent right and trademark right were not completely separated, which was generally known as industrial property rights, and was recognized in the

international field and passed international legislation. This development process also provides a certain basis for the systematic development of intellectual property law. To truly realize the institutionalization of intellectual property law, we need not only the support of theoretical basis, but also the basic conditions of civil code. In addition, the establishment of the system of intellectual property law needs to be built on the non-material interests, such as copyright and trademark rights, and the personal experience of the existence of these non-material interests changes with the development and progress of society. [4] Throughout the development process of intellectual property law, from the early theoretical construction to today's institutional construction, the overall development speed of intellectual property law is obviously better than other laws, and when the intellectual property law really moves towards the direction of code law, it will inevitably have a cross century transformation. The codification of intellectual property law can fully reflect the results of the ideal legal system, and can show the national conditions of a country and the overall international development trend. From the point of view of legislators, the process of codification of intellectual property law is a unified act of intellectual property law. As early as the intellectual property law was not born, the legal protection of intellectual property was relatively lacking, and even there were conflicts between laws. The codification of intellectual property law is the centralized management of intellectual property content. The realization of this goal must be based on the systematization of intellectual property law. [5]

3. CONCLUSION

Generally speaking, in order to maintain the sustainable development of socialist market economy and stabilize the existing social order, the codification movement of intellectual property law has become an inevitable development trend. In the process of achieving this goal, we need to deeply understand the basic rules of legal development, and should not rush for success, and constantly strive to achieve this development goal.

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On the Application of the Rule of Maliciously Complementing Ages in China

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Abstract: The formation of the rule of maliciously complementing ages has experienced a long period of development. It first originated in the United Kingdom. It conformed to the needs of contemporary society to manage juvenile crimes, and later used and further developed by the United States and other countries, and received good results. With the increasing rate of juvenile crime, the public is focusing on the issue of a younger age of crime, and discussions about whether the age of criminal responsibility should be lowered have become more intense. Faced with the shortcomings of our country's juvenile justice system, we can absorb the rules of "maliciously complementing ages" in common law countries and conduct a comprehensive and rational analysis as a supplementary rule for juvenile delinquency determination in specific types of crimes to meet the actual needs of the prevention of crimes at a younger age. **Keywords:** Maliciously Complementing Ages; Younger Age of Crime; Age of Criminal Responsibility

1. THE ORIGIN AND DEVELOPMENT OF RULE OF MALICIOUSLY COMPLEMENTING AGES

(1) The Origin of Rule of Maliciously Complementing Ages

The formation of rule of maliciously complementing ages has experienced a long period of development. It first originated in the United Kingdom, and was later used and further developed by the United States and other countries. The United Kingdom and the United States typically reflect the development and practice of rule of maliciously complementing ages. Rule of maliciously complementing ages is a supplementary applicable rule for presuming the age of criminal responsibility when dealing with criminal cases of minors of a certain age in common law countries. It has been used by many countries to solve the problem of a younger age of crime. When inferring whether minors of a certain age have the capacity for criminal responsibility, common law countries will adopt the rule of maliciously complementing ages, which is a modification and improvement of the criminal responsibility age system. That is, when a minor of a certain age who is presumed to be incapable of criminal responsibility according to law commits a serious crime, if the prosecution can submit relevant evidence that proves that the minor knew the crime was serious and illegal when he committed the crime, it can be determined Possessing "malicious" presumption that it has the capacity for criminal responsibility and shall be held criminally liable.

(2) The Development of Rule of Maliciously Complementing Ages

Regarding the standard of proof of malice, there are still great differences in the judicial practice of the United States. However, it is generally believed that the standard of "beyond reasonable doubt" can accurately determine the facts of the crime and protect the innocent from criminal responsibility. If an adult has reasonable doubts about the facts related to the constituent elements of the crime involved, it should be determined that the perpetrator does not constitute a crime, or he shall be convicted. In order to ensure that innocent minors of a certain age are protected from criminal responsibilities, the standard of proof of the rule of maliciously complementing ages should be strictly stipulated, and the proof standard of "beyond reasonable doubt" is more appropriate. In order to effectively control the younger age of school violence among minors, the common law countries have stipulated that the age range of rule of maliciously complementing ages is 7-14 years old in criminal legislation. The subjective viciousness of criminal offences for minors over 14 years old is determined. As a reference factor for the determination of crimes and sentencing, it reflects the essence of the criminal spirit of juveniles "education is the mainstay and punishment is supplementary" and builds a prevention mechanism for juvenile delinquency.

2. THE CURRENT STATUS OF CHINA'S JUVENILE JUSTICE LEGISLATION AND PRACTICE

(1) Legislation

According to the rigid provisions of my country's current legislation, minors under the age of 14 cannot be held criminally responsible for committing any criminal acts. Current juvenile delinquency has begun to set foot in certain criminal fields exclusively reserved for adults in the past, with characteristics such as younger age and intelligent crime. In a case in Shenzhen in November 2019, a 13-year-old boy, Cai XX, brutally murdered a 10-year-old girl. He was exempt from criminal accountability because he was under the legal age of criminal responsibility and was taken into custody by the government. This case has aroused the public's heated debate about the age of criminal responsibility, and there was a strong call for lowering the age of juvenile crime. The problem of the young age of juvenile delinquency is a common problem faced by all countries in the field of juvenile justice. Through long-term exploration and practice, some mature and effective solutions have been formed.

China's current legislation on handling minors suspected of crimes is rather crude, and cannot effectively prevent the problem of juvenile crimes. The Criminal Law stipulates that minors under the age of 16 are not subject

to criminal punishment, and their parents or guardians can be ordered to strengthen their discipline, and the government can be taken in and retrained when necessary. However, what is meant by "when necessary" still requires the practice department to flexibly grasp the harm of the minor's behavior and the nature of the case, but the legislation does not involve the substantive management of parents or guardians. The Law on the Prevention of Juvenile Delinquency and the Law on the Protection of Juveniles stipulate that when schools and families are unable to carry out substantive training of minors who have not reached the age of criminal responsibility, they can be sent to work-study schools for correction. Because this provision is not a mandatory content of the legislation, coupled with problems such as the lack of a supporting implementation system for work-study schools, in practice, fewer minors who accept work-study school management and re-education have committed crimes at younger ages.

(2) Judicial Practice

Current juvenile delinquency has trends such as younger age and violent criminal methods, and China's criminal policies on juvenile delinquency are mostly based on leniency, and juvenile delinquency under the age of 14 is only required to commit serious criminal offences. They are ordered to strictly discipline their families or receive the government's custody and education, that is, minors except those aged 14-16 who commit the eight types of specific criminal acts stipulated by the Criminal Law will be diverted before trial. The frequent occurrence of juvenile malignant cases requires comprehensive consideration of the changes in criminal legislation, related policies, and the decline in the total number of minors. It is urgent to equip relevant criminal punishment systems on the basis of existing legislation and judicial systems to achieve treatment of the young Ideal target for juvenile delinquency.

3. SUGGESTIONS ON THE APPLICATION OF RULE OF MALICIOUSLY COMPLEMENTING AGES IN CHINA

(1) Beneficial to the Improvement of the Juvenile Justice System

The introduction of the malicious supplementary age system in the context of the younger age of crime is not just a system, but a set of systems. In order to introduce the rule of maliciously complementing ages to effectively deal with the problem of juvenile delinquency and effectively protect the legitimate rights and interests of minors, the juvenile justice system including the entire process of custody, pretrial, prosecution, trial, and correction of minors should be improved as soon as possible. The operating mode of the U.S. Juvenile Court can be referred to. In addition, whether the young criminal suspects have the ability to fully understand the meaning of the court and express their opinions is also a matter of concern. Therefore, in view of the differences in the intelligence and cognitive abilities of minors and adults and the protection of their rights in court trials, the language of judges in court trials should be as concise and popular as possible, and the relevant procedures, charges,

consequences, etc. should be explained in a timely manner. The juvenile justice system helps to target judicial resources and enhance judicial authority.

(2) Definition of Applicable Age Range

Throughout the legislation and judicial practice of countries in the common law system, the age range for rule of maliciously complementing ages is generally defined as under 10 years old. Taking into account the factors that have been influenced by the Confucian "compassionate young and weak" thought in China since ancient times and the current criminal responsibility age system, when introducing this rule, the age should be determined as 12-14 years old and only applicable to the eight specific crimes stipulated in the criminal law of our country. The current high incidence of juvenile crimes in the younger age group is around 13 years old. With the development of the economy and the improvement of material living standards, the indicators of minors' physical and mental maturity have reached the mark of adults ahead of schedule, which also means the early development of adolescence. Compared with their peers 20 years ago, the development of contemporary minors is nearly 2-3 years earlier. The age boundary for children's transition to minors is 12 years old. Therefore, the starting point for the application of this rule is set at 12 years old is more reasonable. Simultaneously restricting the age and criminal charges can not only provide the continuity of judicial practice and the full play of the human rights protection function of minors, but also the rule can be used as a supplement to the juvenile criminal age determination stage.

(3) Identification of "Maliciousness"

In order to demonstrate the fairness and authority of justice, scientific methods and norms should be used to clarify maliciously supplementing the malicious identification procedures in the age rules. Common law countries have long been concerned about the mental development of minors, and the methods in the determination of malicious intent can provide useful experience for our country. First of all, it is possible to add a social survey of personality in Article 17 of my country's Criminal Law, that is, to examine the personal dangers of specific minors, and stipulate that some first offenders and social influences that have been positively regretted after the "malicious" investigation procedure are over. Smaller and more malleable minors provide opportunities for reform. Based on the original intention of making up for minors' trauma and protecting their fragile psychology, the content of the minor's personality survey must be kept confidential. Secondly, by conducting professional psychological tests on the minors involved in crimes, focusing on their personality characteristics and subjective psychology, and then drawing conclusions to judge subjective malignancy and personal danger. In our country's legislation and related judicial interpretations, psychological evaluation is not provided in the handling of juvenile criminal cases to ensure the fairness of the evaluation of individual willpower and identification ability of minors. It is necessary to clarify the relevant application of psychological evaluation in criminal

legislation. Finally, in order to protect the interests of minors in litigation to the greatest extent, centering on the probative power of the evidence presented by both the prosecution and the defense against malicious intent, it may be necessary to require evidence that focuses on the absence of malicious intent to be more convincing. If the defense can prove that malicious intent does not exist, it can be determined that malice does not exist, which is the proof standard of "superior evidence" adopted by countries in the common law system. China's Criminal Procedure Law clearly stipulates that "the facts are clear and the evidence is reliable and sufficient" can only be sentenced to the defendant's guilt, that is, the standard of proof is clear. The PR curatorial organ bears the responsibility of proving the facts of the defendant's crimes in public prosecution cases, and the defendant only bears the corresponding burden of proof for the legally active defense. However, as far as the current proof standard system is concerned, the defendant's burden of proof only needs to reach a lower proof standard. However, the relevant legislation and judicial interpretation have not defined the extent to which this proof standard needs to be. In addition, the introduction of the rule of maliciously complementing ages will put forward higher requirements on the comprehensive quality of judicial personnel, because the litigation process of each case needs to be

realized through the specific performance of judicial personnel, and professional judicial teams can accurately identify and appraise the behavior of minors is directly related to the effectiveness of law enforcement and the credibility of the court. Enhance judicial capabilities by strengthening relevant training for judicial personnel, establishing a post-event supervision system, and increasing the jurisdiction of trial and approval.

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On the Inheritance and Development of Yao People Music

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Abstract: Yao folk songs have local characteristics. Poets began to praise them in The Qing Dynasty. Yao folk songs are the living things of Yao people. They are songs created by oral improvisation by Yao people in their life and work. They are an important artistic culture of Yao people and an important part of Yao people. Therefore, Yao folk songs have been inherited and innovated by Yao people from generation to generation. Yao folk songs have the characteristics of singing language, so it is necessary to strengthen the research, which is conducive to a deeper understanding of the development of Yao folk songs.

Keywords: Yao Music; Inheritance; Development

1. OVERVIEW OF YAO MUSIC

At present, we cannot study the specific time when yao music belongs to. However, poets in the Qing Dynasty praised it. Yao's music covers a wide range of areas, including astronomy, geography, marriage, funeral and other specific forms of expression. Singing can be used to express people's emotions in daily life and holidays, which is yao's lifestyle as well as the continuation mode of Yao's music. In the life of Yao people, Yao folk songs play a very important role, through the baptism of time, Yao music also began to become a representative of the Chinese culture.

Yao nationality is an ethnic group with a long history. Living in the mountains, yao nationality has many branches and forms its unique ethnic culture, which adds a beautiful color to China's splendid ethnic culture. At the same time, the Yao nationality is also a nation that can sing. Qu Dazhun, a poet in the Qing Dynasty, once wrote in his poem that "Yao's folk songs are the most popular, with men and women playing together and singing a hundred songs together". Yao music is not only an important part of Yao's traditional culture, but also the crystallization of China's excellent traditional culture. Yao music includes three parts: vocal music, instrumental music and yao dance music. Yao's music has a variety of tunes, which can express the yao people's joy, anger, sorrow, music and other emotions. According to preliminary understanding, there are no less than 20 kinds of yao musical tunes in China. For example, there are eight songs in Yao's Pan Wang Da Ge. Due to the limited space, the author will analyze and analyze the representative instrumental music of Yao Nationality, Yao Dance Music, and representative vocal music, Flower Butterfly, and put forward opinions.

Yao Dance music was created in the 1950s by Liu Tieshan and Mao Yuan. It is a single movement orchestral music, but also a classic piece of Chinese symphonic works. The song was originally by Liu Tieshan according to

guangdong north guangdong folk songs and yao yao nationality traditional song and dance music - long drum dance for material created the yao's long drum dance, men and women long drum dance is usually double of dance, dance is both soft and tactfully, stiffness and strong again, swinging fell back and rotate around, interesting, so this piece of music is to show the folk song and dance scene. Later, adapted and arranged by composer Mao Yuan, Yao Dance Music became famous as a single-movement orchestral piece. After it was performed by the National Symphony Orchestra, it spread widely and became a classic. The song is rich and vivid to show the happy scene of yao people singing and dancing. The melody is beautiful, showing the life of Yao people who are good at singing and dancing.

Butterfly Song is one of the characteristic songs of Wuzhou Yao and has been included in the second batch of national intangible cultural heritage list. As an important medium for yao young men and women to communicate and get to know each other, it is also an important part of Yao's music culture. The unique culture, environment and customs of Wuzhou Yao make the butterfly Song form its distinctive musical features. First of all, Butterfly Song is the product of young men and women in Wuzhou Yao singing "choosing a spouse by relying on songs" in love, and its social communication function makes it form a two-part singing form. Its melody by the palace, the shang, the horn, the sign of the four:tone formation of the palace. The metronome is composed of aperiodic symmetrical metronome and free rhythmical metronome, which generally reflects the rhythmical characteristics of folk songs.

2. THE HISTORICAL AND CULTURAL VALUE AND PRACTICAL SIGNIFICANCE OF YAO MUSIC

With the development of economy and the continuous improvement of people's living standard, the development of traditional culture has been valued by all social strata. But, on the inheritance and development of traditional culture, not only stay in it above the head, but should be on the state of the protection of the cultural formation, and to protect the implementation of divination to action, the yao's music has a wealth of artistic form, it's previous life custom culture, is the modern people to understand and know the traditional culture with the help of media. Therefore, yao music has a very high historical value. At the same time, as future generations, we can neither completely deny nor affirm the Yao culture. We should inherit and develop it critically. Moreover, as for yao music with historical and cultural contents, studying and studying Yao music is not only the promotion of traditional culture, but also an important push to promote

the development of modern civilization. It can be seen that Yao music has rich historical and cultural value and realistic significance, which requires us to recognize the traditional culture with a correct attitude.

3. INHERITANCE AND DEVELOPMENT OF YAO MUSIC

Yao music is the history and epitome of the development of Yao traditional culture, bearing the civilization and wisdom of Yao people. In its own long development process, Yao music has formed distinct artistic characteristics and become a brilliant treasure of China's traditional culture. With the development of The Times and economy, the inheritance and development of Yao music is facing severe challenges in the era of globalization and information technology. It is of great significance to promote the new development of Yao traditional culture how to inherit and develop Yao music in a more effective and innovative way. The author will put forward personal Suggestions on the inheritance and development of Yao music.

3.1 Inherit the tradition and protect the living environment of Yao music

Yao music is rooted in the environmental soil such as the traditional meeting period and song festival. Yao music exists in specific singing occasions, such as the meeting period, song festival and other traditional folk customs, with social functions. Only by protecting the living environment of Yao music can Yao music continue to be inherited and developed. Therefore, it is necessary for local governments and cultural departments to strengthen the awareness of protection, actively guide and strongly support the restoration and development of folk activities such as traditional meeting period and song festival, so as to provide a good original environment and platform for yao people and promote the active atmosphere of Yao music.

3.2 Follow The Times and innovate the way of creation and dissemination of Yao music

The traditional way of Yao music transmission is in small areas such as song festivals. Nowadays, in an era of science and technology, with developed Internet technology, the transmission of Yao music should follow the development of The Times and make full use of the Internet to spread excellent Yao music to the whole country and even the whole world. At the same time, it is necessary to strengthen the creation of Yao music techniques, the use of contemporary advanced professional techniques into the original Yao music

By refining and changing, the company selects traditional Yao music materials with a new creative concept, conducts all-round weaving and editing, and creates more classic works such as Yao Dance Music, striving to improve the quality and status of Yao music.

3.3 Popularizing and appreciating folk music

Yao music has strong regional cultural characteristics, carries the wisdom and spirit of Yao people, and has a high historical value. Therefore, it is necessary to do a good job in the publicity of teaching, especially for young people, to arouse people's awareness and love of ethnic music, and to make people realize the existence value and

significance of Yao music. In addition, Yao music can be introduced into school education to cultivate yao music culture from an early age. The communication effect of school education can strengthen the whole society's understanding and understanding of Yao music, and it will play a positive role in promoting the inheritance and protection of Yao music.

4. MEASURES TO INHERIT AND DEVELOP YAO MUSIC

For a long time, most people have a natural attitude towards the inheritance and development of Yao music. It is this "natural" mentality that makes many people fail to establish the right attitude towards this cultural form. Therefore, in the inheritance and development of Yao music, it is necessary to constantly strengthen the awareness of protection and inherit and develop Yao music with a rational attitude. Specific can proceed with from with cast a few respects.

4.1 Establish firm national consciousness

Yao music has strong regional cultural characteristics. It carries a certain period of national history and culture, with high historical and realistic value. Therefore, in the process of protecting Yao music, relevant departments must do a good job in the publicity work of this cultural form. Pay particular attention to the publicity of young people. This can not only make young people realize the value and significance of the existence of Yao music. At the same time, it can also help people improve their cultural quality and artistic taste, so as to make their comprehensive quality rise to a new height.

4.2 Follow the trend of The Times

Due to the natural attitude in the concept of traditional culture protection, the lack of traditional culture protection, which is very unfavorable to the cultural development of our country. Therefore, it is necessary to follow the trend of modify and transform the traditional culture in the context of the cultural background. In this way, Yao music can transcend the development while maintaining its own essential connotation. Therefore, in the inheritance and development of Yao music, we must have a higher level of understanding of the form of this culture. Then complete the protection act on this basis. Of course, the protection of Yao music is not only limited to formal ACTS, but more needs to be protected to create a resonance and identity with its consciousness. In other words, we should grasp the relationship between the cultural environment of The Times and the wood of Yao's music, and complete the comprehensive and thorough protection consciousness, so as to ensure the protection and development of Yao's music in the true sense.

4.3 Focus on the process of inheritance

The protection of any kind of culture and art is a long and complicated process. And there are a lot of problems in this process. This requires us to face up to these problems with great confidence and courage, which is not only the necessary temperament to protect traditional culture, but also the determination to achieve cultural protection. Therefore, in terms of the inheritance and development of Yao music, we must show courage and do a good job in dealing with all kinds of possible problems at any time, so

as to truly ensure the long standing development of Yao culture in China.

4.4 Strengthen communication with the outside world

Since the beginning of the 21st century, the countries of the world have been linked together as a whole. In this context, the cultures of different countries have gradually formed a certain impact and collision. This is both an opportunity and a challenge for the development of China's traditional culture. Therefore, in the inheritance and protection of Yao music, we should actively make use of the current form and strengthen the exchange and communication with the outside world. Can with the help of China's reform and opening up, more will be introduced to combined with policies to go out, to Yao's music to the world at the same time, and to ensure that the elements involved in the world, so that Yao's music is not only in our country, also be the world's cultural treasure, for promoting the Yao higher music to a bigger stage, has the vital significance.

5.CONCLUSION

As a splendid part of China's excellent traditional culture, Yao music carries the spirit and wealth of Yao people and is the product of Yao's history and civilization development. With the continuous development of The Times, people's pursuit of culture and art is also showing

a diversified trend of development. In this context, the inheritance and development of Yao music requires the joint efforts of all social strata. Yao music on the one hand, need to realize the value of the historical and realistic significance of existence, on the other hand, the government departments concerned should launch the necessary culture protection policy, the real protection consciousness of the Yao nationality music will into people's hearts, and to urge them to above to translate it into action, to promote the development of Yao nationality music towards the higher road.

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Research on the Status Quo And Countermeasures of Library Guaranteeing the Basic Cultural Rights and Interests of Rural Masses-- Take Zhoukou City as An Example

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Abstract: The rural masses occupy a large proportion in the total population of Zhoukou, and play a very important role in the development of Zhoukou economy. As an important part of the public cultural service system, library has the responsibility to protect the basic cultural rights and interests of this group. Through the investigation and analysis of Zhoukou city rural people enjoy the basic cultural rights and interests of the current situation, to promote the library to actively expand the service field, enhance the protection of rural people's basic cultural rights and interest's awareness.

Key words: Library Rural; Masses Basic Cultural; Rights And Interests

1. LIBRARIES SHOULDER THE IMPORTANT MISSION OF PROTECTING THE BASIC CULTURAL RIGHTS AND INTERESTS OF RURAL PEOPLE

"Basic cultural rights and interests" is a new subject put forward by the Party in the new period. The report of the 17th National Congress of the Communist Party of China put forward for the first time that "we will enhance the country's cultural soft power to better protect the people's basic cultural rights and interests". As an important part of the public cultural service system, library is an important embodiment of the soft power of a city or region or even a country. It bears the lofty goal of realizing and protecting citizens' basic cultural rights and interests, meeting citizens' basic cultural needs, and shouldering the responsibility of popularizing knowledge, disseminating information and guaranteeing citizens' rights to acquire knowledge and information.

As a large agricultural city, the rural population accounts for a large proportion of the total population of Zhoukou, and they bring inestimable value to the economic development. Therefore, the protection of the basic cultural rights and interests of this group is conducive to social harmony and stability as well as social progress. Through the investigation and analysis of Zhoukou city rural people enjoy the basic cultural rights and interests of the current situation, to promote the library to actively expand the service field, enhance the protection of rural people's basic cultural rights and interests awareness.

1.1 Library is an important way for rural people to receive equal education

The economic situation of rural areas in Zhoukou is not

optimistic. Before the implementation of nine-year compulsory education, many rural people did not enjoy the right to receive education in schools, resulting in their low cultural literacy. Libraries have become an important way for them to receive equal education in the society and an important platform for them to obtain information and knowledge. Through library, the rural masses can not only learn scientific and cultural knowledge, develop intelligence and cultivate the ability of scientific thinking, but also improve their own moral quality and even get rid of poverty, which is conducive to social harmony and stability.

1.2 Library is an important place for the rural masses to enrich their spiritual culture

Located in the central plains of Zhoukou city, the economy is not very developed, the development of rural cultural undertakings seriously lags behind, the rural masses lack of cultural entertainment activities. A large number of empty nesters, left-behind women and children lead dull and monotonous spare time lives, and their spiritual and cultural needs are not met. Libraries should continue to serve the grassroots and the rural people, carry out mass cultural activities regularly, and make libraries an important place to enrich the spiritual culture of the rural people.

2. THE STATUS QUO OF LIBRARIES' PROTECTION OF RURAL PEOPLE'S BASIC CULTURAL RIGHTS AND INTERESTS

Through the investigation of the current situation of Zhoukou public library, the author finds that it has many problems, such as small quantity, weak literature construction resources and limited service conditions, so that it cannot fully protect the basic cultural rights and interests of the rural masses.

2.1 Small number of public libraries

According to the data of Henan Statistical Yearbook in 2012, there are 10 county-level public libraries and 1 municipal public library in Zhoukou, and the coverage rate at the municipal and county levels has reached 100%. However, there are no public libraries in the villages and towns where the vast majority of rural people live, so that they cannot fully enjoy the library's various resources.

2.2. Weak literature resources construction

Most of the public libraries in Zhoukou city have little collection accumulation, especially the books that meet

the needs of the rural masses are very vacant, which cannot meet the cultural needs of the rural masses.

According to the Public Service Guide issued by the United Nations, public library collections should be 1.5 to 2.5 volumes per person. Zhoukou's per capita collection in 2011 was only 0.054 volumes, far below that standard. In addition to the low degree of networking and digitization, information infrastructure construction is weak, many rural areas are difficult to read the phenomenon of widespread.

2.3 Restricted conditions of Service

The public libraries in Zhoukou are far away from the rural areas, and the groups they serve are mainly the people in urban areas and county towns. Due to historical reasons, librarians' academic qualifications and literacy are generally low, and their awareness of active service is not enough. They mainly take the passive and backward service mode of waiting for readers to come to their library, which leads to the small opportunities for rural people to enter the library, and their reading rights are greatly restricted.

3. COUNTERMEASURES FOR PUBLIC LIBRARIES TO PROTECT THE BASIC CULTURAL RIGHTS AND INTERESTS OF RURAL MASSES

In order to build a harmonious society, build a harmonious culture and improve the cultural quality of the rural masses, the author puts forward some suggestions and countermeasures from the following aspects, hoping that the library will become an important position to better protect the basic cultural rights and interests of the rural masses.

3.1 The government should attach great importance to it and increase its investment in rural areas

"Covering the whole society", "universal equality, benefiting the whole people" are the important characteristics of the public cultural service system. Therefore, public library services must extend to all Spaces and groups of the society, and make due contributions to the construction of a relatively complete public cultural service system covering the whole society. Therefore, the government should increase the investment in the scale of public libraries by setting up branches and grassroots libraries of existing public libraries and appropriately increasing the number of township public libraries. At the same time, mobile libraries can be set up to send various types of books to the rural masses. On the one hand, they can be provided with spiritual food; on the other hand, they can be helped to get rich by reading scientific and technological books. 2012 urban library in the town of the city's 15 conducted lasted more than two months of culture, science and technology, health, "a program under which officials" activities, for the majority of the rural masses sent crop planting, livestock farming and other kinds of more than 1000 books, greatly enrich the active farmers amateur life, improve their ability to get rich, get the welcome of the peasants and the high praise.

3.2 Take the construction of rural library as an opportunity to enrich the spiritual and cultural life of the rural masses
As a form of library system existing in rural areas, rural

library building is an important part of rural public cultural system, a communication point of rural knowledge and culture and a window of rural health and cultural orientation, which is related to the cultural livelihood and the well-being of farmers. By the end of August 2011, Zhoukou village peasant bookstore, 3033 have been completed, the public library should take this opportunity to set up cultural junction in farm house, help peasant bookstore rational allocation of library resources, given a certain number of books donated and technical guidance, to provide literature resources, technology and personnel support, carry out various forms of cultural services, and make rural people take part in the management of the house, let them experience the fun of study and work, too. The construction of rural libraries can effectively activate and enrich the spiritual and cultural life of rural communities, and better protect the basic cultural rights and interests of rural people.

3.3. Serve vulnerable groups, innovate and expand service fields constantly

It is the bounden duty of public libraries to give special support and help to the disadvantaged groups. In October 2011, Zhoukou City Library sent more than 100 kinds of books and periodicals to dozens of rural disabled people, and updated books and periodicals for them on time every month, which solved their difficulties in reading, enriched their spiritual and cultural life, and won unanimous praise from the society. Public libraries should carry out this activity in depth frequently, so that more vulnerable groups can feel the happiness of reading and life, and bring them expectations of life.

In addition, the library should regularly carry out the training of librarians to improve their quality, and at the same time establish the consciousness of active service, carry out the "going out strategy", and constantly expand the service field. Some well-known scholars can be invited to open forums to systematically introduce the cultural systems with Zhoukou characteristics, such as the Fuxi culture of Huaiyang and the Laozi culture of Luyi, so as to meet the growing cultural needs of the people and make the library the main place for the people to understand the history and culture of Zhoukou and promote it. In December 2012, the first Zhoukou Shaying Reading Forum, sponsored by Zhoukou Municipal Bureau of Culture and undertaken by Zhoukou Municipal Library, was themed as "Poetry in the Belly and Books in The Spirit -- Reading Strategies and Reading Methods", aiming to meet the cultural needs of the public, enrich the cultural life of the masses and improve the comprehensive quality of the masses. The event was also warmly welcomed by the rural masses. At the same time, targeted photo exhibitions can be held to address some problems farmers encounter in their daily production and life, with intuitive pictures and vivid and interesting stories to make them clear at a glance.

The success of the third plenary session of the 18th, once again, provided the rare development opportunity for the development of culture, let us seize opportunities and meet the challenge, brave in exploitation, innovation actively, make further enhance Zhoukou city public library

services, radiation, expanding service coverage and rich service content and methods, to provide diversified and personalized services to the public, improve the ability of public cultural services, better rural masses share the achievements of cultural development and make the basic cultural rights and interests of rural masses get better security!

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Research on Team Construction of Online Education under the Background of Open University

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Abstract: In 2012, the Ministry of Education approved the establishment of the National Open University. The Central Radio and Television University and local radio and TV universities at all levels have successively transformed. Under the guidance of policies and the support of modern educational technology, the grass-roots radio and TV universities have carried out the integration and optimization of resources, paying equal attention to academic and non-academic education. In this context, based on the practice of teaching staff construction in local radio and TV universities, this paper puts forward the necessity of online education team construction, and analyzes the defects and causes of team teachers from the perspective of the number of teachers, the application ability of scientific research and modern technology, and the formation of job burnout. Finally, it puts forward the understanding from the talent selection mechanism, scientific research and teaching skills training, supervision and guarantee mechanism. It provides a strong reference for the construction of online education team in grass-roots RTVU.

Keywords: Openness; Transformation; Online Education; Team Construction

1. RESEARCH BACKGROUND OF ONLINE EDUCATION TEAM

Since its establishment in 1971, the Open University has been recognized at home and abroad by virtue of its school running purpose and advanced teaching staff construction concept. Community colleges, which account for half of American universities, employ professors, scholars and industry experts from other schools for 60% of their faculty, rather than the traditional lifelong system [1]. India Gandhi National Open University is characterized by discipline construction and teaching staff construction. It has cultivated a large number of senior professionals for India.

Looking at the foreign Open University teacher team construction methods, one is through the open recruitment, the second is the strict training system, and the third is the reasonable supervision and management of teacher teaching [2].

The Open University of China, founded in July 2012, is based on the former Radio and TV University. It faces the whole society and pays equal attention to academic and non-academic education through distance open education. With the transformation of RTVU, various defects in the process of teaching team construction are constantly emerging. Serious analysis of these problems and

effective countermeasures have attracted the attention of many researchers.

Some researchers put forward the importance of teaching team construction from the perspective of the development of distance online education. They think that when learning from the successful experience of other countries, we should combine the national conditions of our country, and propose that the key to promote the connotation construction of Open University is to strengthen the construction of teaching team [4]. From the perspective of the current distance learning mode, researchers have proposed the attempt of teaching and learning in Internet plus. It is considered that the establishment of curriculum or professional teachers' team across institutions is particularly important, [5], which involve the transformation of the functions of educational team members and the requirements for teaching scholars. From the perspective of team overall ability, some researchers analyzed and discussed the influence of member structure on team ability in the process of online education team construction in the process of RTVU transformation [6].

Most of the domestic researchers' exploration is around the goal of Open University, which has certain reference value. However, the study found that most of the exploration is from the perspective of top-level design.

There are different national conditions at home and abroad, and the development law of education is also different. If China's open university wants to develop, it is necessary to find the focus on the connotation development, which is beyond doubt. The construction of education team is the first problem to be solved in the connotation development. Any school, only with a high-quality education team, can guarantee the school running and personnel training. The "openness" of Open University stems from the "openness" of its educational resources, educational objects, learning methods and learning process. In order to transform RTVU into an open university, all teachers must experience the essential transformation of their roles and strengthen the construction of online education team. The reasons are as follows:

1.1 requirements for transition to Open University

Although the Open University is based on RTVU, it is a new independent university after all. After years of vigorous development of China's higher education, social recognition of colleges and universities pay more attention to its connotation, quality and high-level academic education. If the open university wants to be recognized by the society, it must be based on the high-quality

educational achievements. At the same time, the Open University shoulders the important task of constructing the lifelong education system and takes the lead in the social non-academic training, which forces the education team to improve as a whole.

The educational teams at different levels of the RTVU system originally have clear responsibilities and different emphases. The division of functions of teachers at different levels is the basic requirement of Open University. Therefore, in the process of transformation, the construction of high-quality education teams must be strengthened.

1.2 requirements of economic development

The lifelong development of vocational education has been given new demands at the 18th CPC National Congress. The concept of "new economic normal" was put forward in the Third Plenary Session of the 18th CPC Central Committee. The concept of "innovation driven" will become the driving force of regional economic development, and the accumulation of human capital is a necessary condition for all innovations to be realized. Therefore, various post service non-academic education and pre-service and post service skills training of Open University will face a broader development. In the process of regional economic transformation, the grass-roots radio and TV universities that have transformed into Open University undoubtedly shoulder the heavy responsibility of training and transporting a large number of talents, and also put forward higher requirements for the quality and quantity of the education team.

1.3 requirements for school scale

The teaching business of grass-roots radio and TV universities transformed into open universities will touch all-round lifelong learning of the whole people, such as elderly education and community education in various regions. The development prospect will be broader and the scale of school running will be correspondingly expanded. If RTVU can seize this opportunity, take the construction of education team as the starting point, and improve the comprehensive quality of teachers, it is bound to guarantee the driving force for the expansion of school scale, and finally win the key battle of transformation.

2. PROBLEMS OF TEACHING STAFF

In the process of development and transformation, there are three problems in the construction of teaching staff.

2.1 the number of teaching staff is insufficient

Most of the grass-roots radio and TV universities have the problem of insufficient number of teachers since they started school. With the transformation of RTVU, due to the expansion of school scale and the addition of specialties, the number of full-time teachers is even more insufficient. In addition, due to the development requirements of various training such as non-academic education, RTVU teachers are in short supply [7]. In particular, some talents are scarce, so the school has to pay high costs for a large number of external teachers. The shortage of teachers has become a major problem in the development of RTVU.

2.2 lack of scientific research and application ability of modern technology

ACADEMIC PUBLISHING HOUSE

In the majority of grass-roots RTVU teachers, the educational level is low, the educational structure is not reasonable, and the lack of high professional titles, which directly leads to the lack of academic leaders in the related professional research work, the school's scientific research atmosphere is not strong, a few teachers engaged in scientific research for the purpose of evaluating professional titles are in a state of independent work, unable to form effective joint forces, and the level of scientific research achievements is low.

In addition, with the continuous progress of the reform of Open University, the updating of modern distance education technology is faster and faster, and the requirements are higher and higher. The lack of modern education technology application ability of full-time teachers in grass-roots radio and TV universities is gradually revealed, which gradually appears "lack of stamina" in actual teaching.

2.3 spread of teachers' job burnout

In all colleges and universities in China, adult education institutions are greatly affected by the social environment. At present, radio and TV universities at all levels are in the critical period of how to transform into open universities. Grassroots teachers have a sense of burnout caused by the pressure from social expectations, student needs, school management, teaching performance, living environment and so on.

2.3.1 low sense of honor

Although the National Open University (including RTVU at all levels) has nearly 100000 teachers and millions of students, it has cultivated a large number of talents for the development of all walks of life. However, the recognition of RTVUs at all levels in society is not high. In addition, various kinds of adult education are mixed in the society, which leads to the prejudice of most people to the education of radio and TV university, and think that the students of radio and TV university cannot be compared with the students of ordinary colleges and universities. On the other hand, there is unfairness in the employment of college students.

2.3.2 low work enthusiasm

The enrollment expansion of ordinary colleges and universities and the continuous enrollment expansion of millions of higher vocational colleges, together with the competition without bottom line in other adult colleges, lead to the uneven quality of students who need to improve their academic qualifications. The contradiction between the demand for enrollment and the basic requirements of teaching, the contradiction between the style of study and the bottom line of teachers' traditional teaching are difficult to reconcile. In addition, the social prejudice against the educational background of radio and TV universities has a negative impact on grass-roots RTVU teachers' passion for work [8].

2.3.3 low work efficiency

Due to the complexity of the needs of the educational objects in grass-roots radio and TV universities, most teachers' teaching cannot reach their expected bottom line. If the school management is not in place or the incentive measures are not appropriate, it is easy to lead to teachers'

procrastination and low efficiency.

Through the investigation, it is found that the phenomenon of job burnout caused by the above reasons has become a unique problem of RTVU education team. If it is not handled properly and allowed to spread, it will seriously affect the stability and development of grass-roots RTVU, let alone smooth transition.

3 ANALYSIS OF THE CAUSES OF THE PROBLEM

As mentioned above, under the background of the transformation of grass-roots RTVU into Open University, there are many problems in the construction of education team, which are mainly caused by the following three aspects:

3.1 lack of reasonable structure of teaching staff

The requirements for teachers are almost all-round in the transformation of grass-roots RTVU into Open University

3.1.1 teachers can not only stand on the platform, but also go online.

Standing on the platform, teachers must have enough professional knowledge; and to go online, teachers need to constantly update new modern education technology, master distance education methods.

3.1.2 the teaching methods of teachers should be better at communication and pay attention to inspiration and guidance.

The needs of online distance education objects are diverse, and higher requirements are put forward for teachers' communication ability and methods. They should not only be familiar with modern communication methods such as WeChat and QQ, but also have the ability to inspire and guide students to focus on acquiring knowledge through these ways, so as to realize the purpose of lifelong learning.

3.1.3 teachers should form a team and constantly update the production technology of online courses.

The production of online courses, such as micro class and MOOC, is not competent for one or two professional subject teachers. It needs the cooperation of a complete team. Of course, if the teachers of professional disciplines are familiar with the production of online courses, they can achieve twice the result with half the effort.

The mobility of teachers in grass-roots radio and TV universities is largely restricted by the employment mechanism of local institutions. The poor mobility of personnel leads to the teachers being older. In today's constantly updated teaching technology, if the age structure of teachers is unreasonable, it will lead to the failure of remote online education.

3.2 teachers do not pay attention to the improvement of scientific research and the use ability of modern information technology

For grass-roots RTVU teachers, if it is not for the title, few people will consider scientific research, and the school does not have too many requirements for scientific research. Scientific research means learning, exploration and innovation. Long term neglect of scientific research will not only lead to the lagging behind or even elimination of teachers in their major, but also seriously affect teachers' learning and application of distance education technology, eventually delaying teachers' own career development and seriously affecting the smooth

transformation and development of schools.

3.3 lack of humanistic care

Teachers are the most valuable "assets" of schools, and their needs are the most important needs of schools. Teachers' job burnout is the performance that their legitimate needs have not been met, and the performance of improper school incentive measures. The humanistic care for teachers in schools should be reflected in the understanding and attention to the various needs of different teachers, the respect for teachers' teaching and scientific research, and the respect for teachers' working hours.

The lack of humanistic care will become a short board in the construction of the education team of grass-roots TV universities, which will affect the stability and long-term development of the school.

There are many problems left over from history and many other constraints in the construction of online education team in grass-roots radio and TV universities. However, the lack of reasonable structure of teaching staff, the neglect of scientific research and the improvement of the ability to use modern information technology, and the lack of humanistic care of teachers are the main factors in the construction of compulsory education team. It is a top priority to effectively solve these problems under the background of Open University.

4 SOLUTIONS

For schools, teachers are the most important productive forces. The quality of teachers directly affects the quality of teaching, the realization of various established goals of schools, the evaluation of schools by the society, and ultimately the survival and development of schools. To build a good teaching staff, we must start from the causes of various problems and find the corresponding countermeasures.

4.1 establish the selection mechanism of teaching staff

In the current era of "Internet plus", the grass-roots RTVUs can make full use of the advantages of big data, make scientific planning and rational development of human resources, seek cross-border cooperation in an open way, and establish a reasonable mechanism for selecting teachers through scientific resources.

4.1.1 build online education team according to post classification

According to different positions, the online education team of Open University can be divided into core teaching team, technical support team and auxiliary service team. Different teams are constructed according to different positions, so that teachers can have their own distinctive work. As long as teachers in each position perform their respective duties efficiently, they can jointly complete the education work of Open University. For example, the basic level RTVU teachers directly face all kinds of students, belonging to the core teaching team, as long as they are responsible for providing all kinds of teaching guidance services. This is a bit like the fine division of labor in modern production. The operators of each process complete their own work, and excellent products are at the end of the assembly line.

4.1.2 build online education team according to specific

specialty

Open University has a wide range of teaching, mainly including academic education and non-academic training. Teachers in grass-roots RTVU cannot be limited by a certain way of education team construction, and can flexibly set up personalized teams according to different majors. For example, one professional leader and one daily manager can be held by the teachers in the university (of course, the requirements of professional leaders may be higher), 4-5 part-time teachers can be employed from the teacher platform or other local colleges and universities, and 2-3 practice instructors can be hired from relevant industries, so as to form a teaching team with 8-10 people to better complete the teaching work.

4.1.3 build online education team according to different projects

The "one student per village program" launched by the National Open University for rural areas mainly focuses on the specialty level. The majors include e-commerce, horticulture, forestry and small business management. Most grass-roots RTVUs do not have teachers for these majors. In this case, the grass-roots radio and TV universities must actively coordinate with the local relevant departments according to the specific requirements of the project, and make use of the advantages of the system to establish a temporary education team, which can better complete the different teaching requirements of different projects.

4.2 strengthen the training of scientific research and modern teaching skills

4.2.1 improve scientific research management system

In order to change the situation of insufficient scientific research ability of grass-roots radio and TV universities, the improvement of scientific research management system is the primary problem. First of all, all teachers should have clear scientific research tasks, and teachers at different levels should have different evaluation mechanisms. In the school assessment system, scientific research work should be taken as one of the key points, and the fairness of the assessment should be guaranteed. Secondly, there should be reward and punishment measures for scientific research work, including spiritual and material aspects. These measures must have a certain impact on teachers, in order to mobilize the enthusiasm of teachers. Finally, we must make the majority of teachers fully realize that scientific research is not a simple goal and task, but also the requirement of self-improvement, the practice of lifelong learning and the need of school transformation and upgrading under the background of Open University.

4.2.2 create scientific research conditions

In order to improve the teachers' enthusiasm for scientific research, the school must provide appropriate conditions for scientific research. On one hand, the school should provide teachers with a variety of opportunities for further study or investigation, hold more joint lectures and other exchange activities, and create a scientific research atmosphere. This can not only let the majority of teachers understand the current academic trends, but also enable teachers to form their own scientific research direction in

the collision of thinking and improve their scientific research level. On the other hand, scientific research not only needs time and funds, but also has risks, which is not necessarily successful. Schools should realize that sometimes teachers spend far more time and energy on scientific research than on teaching, so schools must give teachers more time support. At the same time, the school must have a certain amount of investment in scientific research funds, and can also obtain funding support through horizontal projects from enterprises, governments and associations.

4.2.3 improve the effectiveness of teacher training

With the transformation of grass-roots radio and TV universities, schools need corresponding changes in teaching quality and teaching management.

1. We can actively mobilize the enthusiasm of teacher training by adjusting the policy, and cultivate a group of backbone teachers through the combination of educational practice and scientific research.

2. Through strengthening the pre-job training system for young teachers, we can help them learn and master the open education theory and modern online education technology.

3. We can select young and middle-aged teachers in a planned way to go out to study, improve their academic level or update their knowledge structure, and improve the skills of modern online distance education.

4. We should support and encourage the middle-aged and elderly backbone teachers to participate in the guidance of teaching team construction and young teachers, and encourage teachers to serve the society by serving in different schools and teaching.

Due to the small number of teachers in grass-roots radio and TV universities, it is necessary to tap the potential of teaching staff as much as possible. Strengthening the training of teachers' scientific research and modern teaching skills can improve the overall scientific research and teaching level of the education team, and make the grass-roots radio and TV universities adapt to the needs of transformation faster and better.

4.3 improve the supervision and guarantee system of education team

The lack of humanistic care is indeed easy to cause teachers to produce job burnout, but only humanistic care is not enough. It is more important to improve the team supervision and security system.

4.3.1 improve the supervision and evaluation mechanism

Perfect supervision and evaluation system is conducive to the efficiency and stability of education team work. First of all, the school should take the ability as the standard, respect the talents, and incline the treatment to those who have outstanding contributions in scientific research and teaching, to the subject leaders and to the teaching experts. Secondly, the school should give full play to the role of teaching supervision. Teaching supervision must be a front-line teacher with senior professional title and have many years of teaching experience. Finally, the teaching competition and teaching research should be carried out regularly to evaluate the degree of modern distance teaching ability of the education team.

4.3.2 strengthen the construction of teacher management system

In the teacher management system, the responsibilities

and processes of team teachers must be clarified. Figure 1 shows the analysis of the open teaching process in Taizhou RTVU.

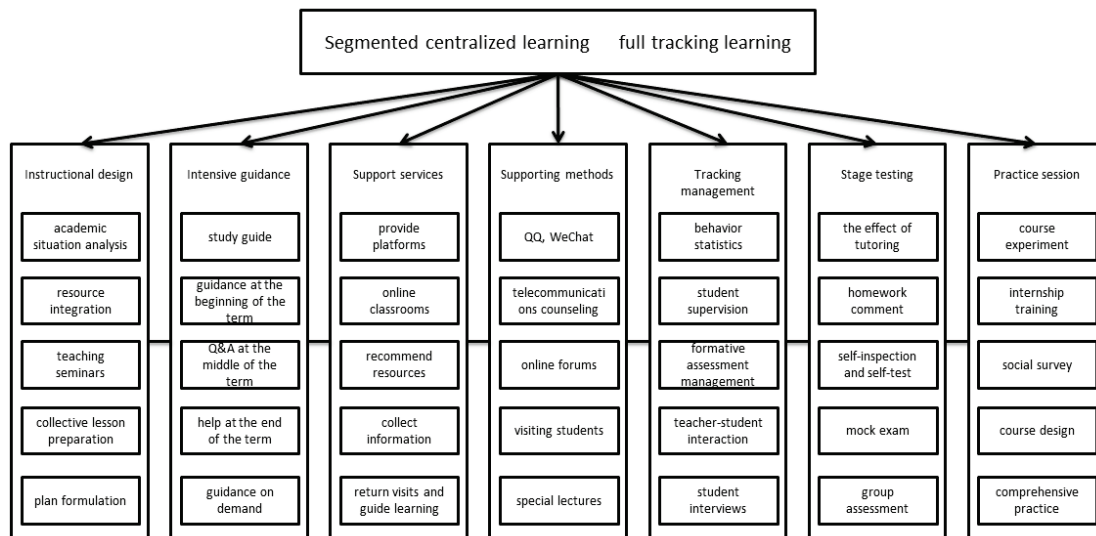


Figure 1 Analysis of open teaching process in Taizhou RTVU

According to the model, the teaching rules and regulations system including the responsibilities of all kinds of teachers, teaching system, teaching implementation scheme, various curriculum management systems, teaching inspection and other aspects are established, so that the teachers of online education team can carry out their work in a standardized and orderly manner.

4.3.3 develop incentive measures

According to the actual situation, the incentive measures can be considered from the following aspects: the passing rate of subject examination, the score of formative assessment, the score of students and academic affairs office, the production of online resources, and the record of interaction with students. Incentive measures must be able to reflect the work value of teachers, in order to stimulate the enthusiasm of teaching and scientific research of the education team, and to stabilize the external teachers.

4.3.4 strengthen the construction of campus culture

For grass-roots radio and TV universities, the core of strengthening the construction of campus culture is to establish teachers' identification with RTVU and teaching work, and students' identification of RTVU and learning mode, with the purpose of creating a progressive and pragmatic lifelong learning value and behavior mode. Therefore, it is necessary for schools to show concern for teachers and students from the cultural level, improve the satisfaction of teachers and students, and improve the happiness index of teachers and students.

5. CONCLUSION

Nowadays, there is no uniformity of standards in the construction of online education team, but one thing is certain, that is, the members of the education team come from the radio and television university system itself, and the other is from the social resource library. What each team explores is nothing more than what is the ability standard of the member combination. With the gradual improvement of the National Open University system and

the continuous improvement of modern information technology level, grass-roots radio and TV universities will get more support from the perspective of top-level design of the system [9], but the most important thing is the school and teachers themselves. Starting from the transformation practice of Taizhou Radio and TV University, this paper explores and tracks the construction of online education team, and obtains a series of achievements, which can be used as a reference for the construction of online education team in relevant grass-roots RTVUs under the background of Open University.

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Study on Fermentation Conditions of *Ganoderma Applanatum*

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Abstract: The optimal liquid fermentation conditions of *Ganoderma applanatum* was studied respectively by single factor tests. Carbon source, nitrogen source, pH value, cell age, inoculation amount, bottled volume and temperature were studied in this paper. The results showed that the optimum carbon source of mycelium growth was corn flour, the optimum nitrogen source was soybean powder, the optimum pH value was 5~6, the optimum cell age was 62 h, the optimum inoculation amount was 15%, the optimum temperature was 25~28°C.

Keywords: *Ganoderma*; *Applanatum*; Mycelia

1. INTRODUCTION

Ganoderma lucidum, also known as *Ganoderma lucidum*, contains a variety of active ingredients. *Ganoderma lucidum* is small and light, and is often used as edible and medicinal in Chinese and Japanese [1]. According to clinical reports [2-6], *Ganoderma lucidum* can be used to treat atherosclerosis, hypertension, angina pectoris, neurasthenia, hyperlipidemia, insomnia, cough, asthma, chronic bronchitis, diabetes, hepatitis, nephritis, tumor, gynecological diseases and other diseases.

The cultivated *Ganoderma lucidum* has a long growth cycle, large environmental impact, low yield, unstable quality and high production cost, which greatly restricts the development prospect of *Ganoderma lucidum* industry. In recent years, people have begun to turn to the study of deep fermentation culture of *Ganoderma lucidum* liquid. Through the control of fermentation conditions, the production scale has been improved successfully, the production cycle has been shortened, and the production cost has been reduced. Therefore, the study of deep fermentation of *Ganoderma lucidum* liquid has an important impact on *Ganoderma lucidum* industry. There are many studies on *Ganoderma lucidum* at China and abroad [7-9], but there are few reports on *Ganoderma lucidum*, and there are few reports on mycelium fermentation. In this study, the conditions of liquid deep culture were optimized by single factor test, in order to obtain the best culture formula and fermentation conditions suitable for the growth of mycelium of *Ganoderma lucidum*, and to provide scientific reference for the small scale shaking flask fermentation of *Ganoderma lucidum*.

1.1 Material

1.1.1 Strain

Ganoderma lucidum provided by Zhoukou Teachers College

1.1.2 Medium

Solid medium: peeled potato 20%, sucrose 2%, agar 2%, KH_2PO_4 0.3 %, MgSO_4 0.15%, pH natural.

Liquid seed medium: glucose 1%, sucrose 2%, peptone 1%, beef paste 0.5%, KH_2PO_4 0.10% per cent, MgSO_4 0.15%

1.2 Preparation of liquid species

Strain activation: the preserved strain is transferred to the solid medium, cultured at 25°C, and stored at 4°C when the hyphae grows well and fills the plate.

Seed liquid preparation: the liquid medium was sterilized and cooled to room temperature. The activated strain was inoculated and placed in a shaking bed. The seed solution with uniform growth was obtained at 28°C.

1.3 Methods

1.3.1 Determination of dry weight of mycelium

After filtering the fermentation broth with 200 mesh gauze and washing with distilled water for 4 times, the mycelium was placed in 50°C constant temperature electrothermal blast dryer to constant weight, and weighed with electronic balance.

1.3.2 Determination of extracellular polysaccharide

The supernatant was obtained by removing the precipitation of the fermentation liquid after centrifugation. The supernatant was precipitated with 95% ethanol and centrifuged for 12 h before settling. After precipitation and drying, extracellular polysaccharide was obtained and weighed by electronic balance.

1.4 Optimization of fermentation conditions in shaking flask culture

1.4.1 Effects of different carbon sources

Carbon sources (glucose 1%, sucrose 2%) in liquid media were replaced by 3% different carbon sources (glucose, maltose, sucrose, corn flour, soluble starch, control), Other ingredients unchanged, pH nature, A seed solution cultured for 38 h was inoculated at 10% of the dose, cultured in 28°C constant speed oscillator for three days.

1.4.2 Effects of different nitrogen sources

Nitrogen sources (peptone 1%, beef paste 0.5%) in liquid media were replaced by 1.5% different nitrogen sources (peptone, yeast extract, beef extract, bran, soybean powder, control), Other ingredients unchanged, pH nature, A seed solution cultured for 38 h was inoculated at 10% of the dose, cultured in 28°C constant speed oscillator for three days.

1.4.3 Effect of different initial pH value

The medium was prepared with corn flour and soybean flour instead of carbon and nitrogen sources in seed medium. The other components were unchanged. The pH to 4, 5, 6, 7 and 8 were adjusted with 1 mol/L HCl and 1 mol/L NaOH before sterilization. The seed solution of 38 h was inoculated with 10% inoculation. The effects of different pH on the mycelium and extracellular polysaccharide biomass of *Ganoderma lucidum* were

measured.

1.4.4 Effects of different cell age

The medium was prepared with corn flour and soybean flour instead of carbon and nitrogen sources in seed medium. The other components were unchanged. The seed solution of 26 h, 38 h, 50 h, 62 h, 74 h was inoculated with 10% inoculum and cultured in 28°C constant speed oscillator for three days. The effects of different cell ages on mycelium and extracellular polysaccharide biomass of *Ganoderma lucidum* were determined.

1.4.5 Effects of different inoculation amount

The medium was prepared with corn flour and soybean flour instead of carbon and nitrogen sources in seed medium. The other components were unchanged and pH nature. Seed solution of 38 h were inoculated with 1%, 5%, 10%, 15%, 10%, 15% and 20% inoculation, and cultured in a constant speed oscillator for three days at 28°C. The effect of different inoculation amount on mycelium and exopolysaccharide biomass of *Ganoderma lucidum* was determined.

1.4.6 Effects of different temperature

The medium was prepared by replacing the carbon and nitrogen sources of the seed medium with corn flour and soybean flour, and the other components remained unchanged and the pH is natural. Seed solution of 38 h were inoculated at 10% inoculation, and cultured in 22°C, 25°C, 28°C, 30°C, 35°C constant speed oscillator for three days. The effect of different inoculation amount on mycelium and exopolysaccharide biomass of *Ganoderma lucidum* was determined.

2 RESULTS AND ANALYSIS

2.1 Effects of different carbon sources

Table 1 Effects of different carbon sources

Carbon sources	Dry weight of mycelium (g /20 mL)	Extracellular polysaccharide(g /20 mL)
glucose	0.175	0.145
maltose	0.2035	0.196
sucrose,	0.193	0.145
corn flour	0.4675	0.185
soluble starch	0.0715	0.194
control	0.069	0.014

Table 1 shows that all five carbon sources can be used by *Ganoderma lucidum*. Among these carbon sources, corn flour was the best carbon source, and mycelium dry weight was the largest, followed by maltose. Corn flour is a complex carbon source with relatively low cost and wide source, which is suitable for production and promotion.

2.2 Effects of different nitrogen sources

Table 2 Effects of different nitrogen sources

Nitrogen sources	Dry weight of mycelium (g /20 mL)	Extracellular polysaccharide(g /20 mL)
peptone	0.1885	0.0125
Yeast extract	0.342	0.0295
Beef paste	0.1665	0.0235
bran	0.2745	0.0815
Soybean	0.436	0.0585

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meal

contrast 0.0465 0.011

As shown in Table 2, mycelium used soybean powder best, followed by yeast extract and bran. Soybean powder and bran are easy to obtain raw materials and low price. The blank control value without nitrogen source was very low, which indicated that nitrogen source had great influence on mycelium growth.

2.3 Effect of different initial pH value

Table 3 Effect of different initial pH value

pH value	Dry weight of mycelium (g /20 mL)	Extracellular polysaccharide(g /20 mL)
4	0.0695	0.0275
5	0.0715	0.161
6	0.085	0.1315
7	0.042	0.095
8	0.0485	0.1205

The initial pH value in fermentation broth is closely related to the fermentation of bacteria. Mycelium growth is sensitive to pH. The test results of different pH values are shown in Table 3. It can be seen that the mycelium biomass was higher when the pH was 5~6. The results showed that the mycelium of *Ganoderma lucidum* grew better in acidic environment, which was consistent with conclusion in He Hui's article [10].

2.4 Effects of different cell age

Table 4 Effects of different cell age

Cell age	Dry weight of mycelium (g /20 mL)	Extracellular polysaccharide(g /20 mL)
26 h	0.039	0.1425
38 h	0.0412	0.196
50 h	0.0455	0.145
62 h	0.047	0.185
74 h	0.0325	0.194

According to Table 4, the age of 62 h was more suitable, and it was inferred that the seed was in logarithmic growth period, which was the best inoculation time. If mycelium culture time was too long, mycelium growth was slow and easy to aging, or even autolysis.

2.5 Effects of different inoculation amount

Table 5 Effects of different inoculation amount

Inoculation amount	Dry weight of mycelium (g /20 mL)	Extracellular polysaccharide(g /20 mL)
1 %	0.0525	0.1375
5 %	0.0495	0.195
10 %	0.078	0.159
15 %	0.0845	0.1765
20 %	0.0395	0.076

The appropriate inoculation amount can shorten the delay period and improve the fermentation efficiency. The size of inoculation determines the growth rate of mycelium. If the inoculation amount is too small, the fermentation rate is slow, which leads to the growth cycle being elongated and too large, resulting in insufficient dissolved oxygen, which will also affect the growth of mycelium. It can be

seen from Table 5 that the inoculation amount was 15%, the mycelium grew fast, the mycelium was small, and the liquid was clarified.

2.6 Effects of different temperature

Table 6 Effects of different temperature

Temperature	Dry weight of mycelium (g /20 mL)	Extracellular polysaccharide(g /20 mL)
22°C	0.066	0.1045
25°C	0.1485	0.090
28°C	0.175	0.1065
30°C	0.077	0.0985
35°C	0.050	0.109

Ganoderma lucidum is sensitive to temperature when growing. Table 7 shows that with the increase of temperature, the biomass of mycelium increased gradually, and the biomass decreased with 25~28°C as the better temperature.

3. CONCLUSION

The results showed that the best carbon source for mycelium fermentation of *Ganoderma lucidum* was corn powder, nitrogen source was soybean powder, pH value was 5~6, cell age was 62 h, inoculation amount was 15%, temperature was 25~28°C. Corn flour and soybean flour are easy to obtain and they are economic resources, which can reduce production costs. The mycelium in deep culture of *Ganoderma lucidum* germinated earlier and grew faster than that of solid strain. Therefore, using modern fermentation technology can save cost and shorten production cycle for artificial cultivation.

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On the Historical Significance of The Land Reform of The Communist Party of China During the Liberation War

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Abstract: The people eat as the sky. They can't eat without food and oil, and the production of grain and oil cannot be separated from land. China is a large agricultural country with limited cultivated land. How to distribute and who own cultivated land has always been the most basic and important economic relationship issue. Before the land reform, feudal land ownership was the mainstay in rural China. This system hindered the development of productive forces and also caused poverty and backwardness for farmers and the whole country. Therefore, feudal land ownership must be abolished. Under the leadership of the Communist Party of China, the vast number of peasants waged a long, difficult, dangerous and magnificent struggle to abolish feudal land ownership. This article mainly discusses the significance of the land reform movement led by the Communist Party of China to the whole country during the Liberation War. **Keywords:** During The Liberation War; Land Reform; Significance

1. THE HISTORICAL BACKGROUND OF THE LAND REFORM OF THE COMMUNIST PARTY OF CHINA DURING THE LIBERATION WAR

China was in a period of immaturity and maturity during the liberation war, and land reform at that time was a profound rural social revolution. The Communist Party of China has formulated a set of land reform policies that conform to China's basic national conditions through continuous and arduous exploration and summary of previous experience and lessons, which has played a great role in improving the lives of farmers, emancipating and developing the productive forces, supporting revolutionary wars and establishing and consolidating democratic regimes.

During the War of Resistance Against Japan, the land policy formulated by the Communist Party of China was not only in line with the rent reduction and interest rate reduction stipulated on the anti-Japanese national united front, but also on the one hand, it helps farmers reduce rent and interest rates and improve farmers' lives, so as to mobilize farmers' enthusiasm to fight against Japan and production. On the other hand, after the implementation of the land reform policy of rent reduction and interest rate reduction, some rent and interest rates were also carried out to unite the landlord class to participate in the Anti-Japanese War. However, the implementation of the rent reduction and interest rate reduction policy has not fundamentally shaken and denied the feudal land

ownership system of the landlord class, but only weakened the feudal land ownership system and the landlord economy.

By the time of liberation, the civil war situation had changed. At the same time, class contradictions have also changed from contradictions between China and imperialism to contradictions within the people. This period has also become a period of rising class contradictions within the people, and how to deal with the problems related to farmers' land has become the key to reversing the situation. At that time, the Kuomintang only attached importance to the civil war and did not care about land reform. At this time, the land reform policy implemented by the Communist Party of China adapted to the needs of the development of the situation at that time. At that time, the Communist Party of China considered it urgent to correctly deal with farmers' land issues. It was dealt with according to the unique national conditions of China at that time, and applied some of the views of the land policy advocated by Marxism-Leninism to China's reality. For example, the equal distribution of land according to the population by rural areas, as well as the division of classes and the mobilization of the masses, all come from Marxism-Leninism. Through These views have formulated the land system, which not only adapts to China's basic national conditions, but also meets the needs of farmers for land, thus greatly mobilizing the enthusiasm of the peasant people and ensuring the smooth progress of the revolutionary war. It can be said that the Communist Party of China's correct handling of farmers' land issues not only applies Marxism to China's reality, but also lays the foundation for the victory of the liberation war.

2. COMMUNIST PARTY OF CHINA'S POLICY OF LAND REFORM DURING THE LIBERATION WAR

At the Seventh National Congress of the Communist Party of China held in January 1945, Mao Zedong pointed out that the rent reduction and interest rate reduction policy "if there are no special obstacles, we are ready to continue to implement it after the war, starting with the national congress held in January 1945 due to the situation at home and abroad and the strong demand for land by farmers. Realize rent reduction and interest rate reduction, and then take appropriate measures to systematically achieve 'ploughers have their own fields'.

At the end of June 1946, Chiang Kai-shek assembled 80% of his regular army on the front line of the civil war, completing his civil war deployment, and an all-out civil war is about to break out. At this time, the Kuomintang's

military and economic strength prevailed. Chiang Kai-shek was fierce and arrogant to destroy the liberated areas within a year or even three months. At a critical juncture, only by leading the people in their struggle can the Communist Party of China change this situation. If the land issue related to farmers can be solved in the liberated areas, the people of the liberated areas can support the liberation war. At this time, in the rural areas of the liberated areas, because rent reduction and interest rate reduction were no longer enough to meet farmers' requirements for land, in the spring of 1946, in the face of a serious crisis in the national civil war, the Communist Party of China, in accordance with the special circumstances at that time, changed the rent reduction and interest rate reduction policy, and confiscated the land of the landlord class to the farmers. It became a new land policy, and the May Fourth Instructions were born in May 1946.

Then, in June 1947, a year after the May Fourth Instructions were formulated, the domestic situation changed dramatically. The situation of enemy strength and weakness in the early days of the war has been fundamentally reversed, and the People's Liberation Army has taken the initiative in the battlefield. On October 10, 1947, the Proclamation of the People's Liberation Army was issued by the Communist Party of China. In the Declaration, the slogan of battle was timely put forward to defeat Chiang Kai-shek, Long Live New China. The War of Liberation entered a stage of national victory. At this time, the land reform of the old liberated areas revealed some problems that existed in the past. In order to solve these problems, the Party must reflect on the lessons learned from previous land reform in an all-round way, unify the principles and policies of land reform under the new situation, reform the Party and government organizations that are separated from the masses, completely overthrow the land system of the feudal class, meet the aspirations of farmers in the liberated areas to achieve complete land and equalization of land. The war of reform and liberation complements each other and develops jointly to achieve the goal of emancipation of the whole of China. Therefore, the Outline of China's Land Law promulgated by the National Land Conference held on September 13, 1947 became a new land policy. The Central Committee of the Communist Party of China approved it by resolution on October 10 and published it to the world for implementation. After the victory of the Anti-Japanese War, the first publicly promulgated land policy of the Central Committee of the Communist Party of China was the Outline of the Land Law of China, which was the first time since the land reform of the Central Committee of the Communist Party of China in 1937 to re-avoke the feudal semi-feudal land system. It is of great significance for China's land reform. It provides a war leader for the overthrow of feudal exploitation in China and promotes the development of land reform in the liberated areas. However, the implementation of the Outline of China's Land Law does not realize the emergence of "left" mistakes, which diverts the land reform from the right path. Fortunately, the Communist

Party of China found out in time and corrected it at the December meeting, so that land reform proceeded smoothly. Mao Zedong also stressed in April 1948 that according to China's actual situation at that time, a series of principles and policies on the general line of land reform were put forward. The introduction of this policy marks the maturity of China's land reform and also illuminates the way for the victory of the liberation war.

3.THE ROLE OF THE COMMUNIST PARTY OF CHINA'S LAND REFORM DURING THE LIBERATION WAR

(1) greatly improve the lives of farmers.

Under the gradual agrarian reform in the liberated areas, the peasant people have also begun to own their own land and be able to carry out productive labor. Therefore, the enthusiasm for productive labor has been high, and the rural productive forces have been further developed, which has led to a corresponding improvement in the lives of the majority of farmers and class relations. Appropriate optimization adjustment [1]. In the land reform, farmers have obtained not only land, but also the means of production, so the gap between rich and poor between different classes has narrowed significantly, and the lives of farmers have greatly improved. They themselves said, "After the land reform, one year is enough to eat, two years to buy more utensils, and three years to be rich." [2]. According to the statistics of the National Bureau of Statistics on the monetary income of farmers, the average monetary income per farmer from 1949 to 1952 ranged from 14.9 yuan in 1949 to 18.7 yuan in 1950, 23.6 yuan in 1951 and 26.8 yuan in 1952. This increased by 79.9% between 1949 and 1952 before the land reform. Due to the general rise of the peasant economy, the proportion of Chinese farmers in the total number of farmers has also increased rapidly. It is estimated that more than half of the Chinese farmers in the new liberated areas and about 80% of the old liberated areas are about 80%. According to the data of the National Bureau of Statistics on the purchasing power of farmers' personal consumer goods, the purchasing power of farmers' personal consumer goods from 14.2 yuan in 1949 to 17.3 yuan in 1950, 21.6 yuan in 1951 and 24.6 yuan in 1952. [3]. Thanks to the development of agricultural and sideline industries and the exchange of urban and rural materials organized by the government, 400 million farmers after the land reform constitute China's unprecedented purchasing power, promoting the sale of industrial products and providing impetus for its development. Farmers not only buy a large amount of pesticides, livestock, water trucks and new agricultural tools, but also hope to buy cloth, soap, books, flashlight appliances, bicycles, medicines, etc., which has greatly accelerated the development of China's industry and commerce. Supply and marketing cooperatives that connect urban and rural economies through land reform are also rapidly developing one by one. According to the statistics of the second quarter of 1952, there have been 31,953 rural supply and marketing cooperatives nationwide, with 95.46 million members, accounting for an average of 20.14% of the rural population. Farmers' membership is also increasing rapidly.

(2) effectively promote the great development of the productive forces in the liberated areas.

New China's industrialization needs to open the way by emancipating the productive forces, which is also the basic reason and the basic purpose of China's land reform. During the Liberation War, land reform was carried out throughout the country, overthrew thousands of years of feudal land ownership, and the feudal landlord class was eliminated, and Chinese farmers got rid of the shackles of feudal rule. At the same time, they obtained land, liberated rural productive forces and resumed rural productive labor. This purpose was fully realized through land reform.

First, at the beginning of the founding of New China in 1949, although China was a large agricultural country, its technology was very backward, and farmers were almost all engaged in manual labor, which not only restricted the development of productive forces, but also attacked the enthusiasm of farmers engaged in agricultural labor. However, after the land reform, farmers have obtained land without the oppression and exploitation of landlords. In any case, they work for their own lives. Therefore, their enthusiasm for labor and production has been greatly encouraged, and at the same time has greatly changed to improve the productivity of rural China. After the land reform, farmers all over the country generally started early in spring farming. They all overturned the ground, pulled out canals and drilled wells. Generally speaking, they fertilized and sent manure a week earlier than before the land reform, and all kinds of crops were fertilized by 20%. Second, land reform has promoted farmers to actively improve the material conditions of agricultural production. Water conservancy plays a vital role in agricultural production. Before liberation, the embankments of the river were in disrepair all year round, and floods and droughts often occurred. 1949. The area affected by farmland in the country is as high as 120 million mu, about 28 million mu of severely affected fields, and nearly 40 million people have been affected. During the three-year period of national economic recovery, the construction of water conservancy as one of the key tasks of the government's economic recovery has also changed greatly. From 1950 to 1952, the people's government spent about 700 million yuan on water conservancy construction, accounting for more than 10% of the capital construction investment in the state budget. The vast majority of the 4,000 to 20,000 kilometers of embankments in China were renovated. [3]

Third, land reform has also changed the way farmers work. Artisanal labor was the only form of agricultural labor in China before the land reform. After land reform, land and other means of production belong to farmers, and mutual assistance and cooperation are possible for farmers. In areas where the land reform was completed earlier, mutual help groups were generally organized to solve the difficulties of insufficient means of production such as tillage, agricultural tools and labor, adjust the remaining gaps, and give full play to the role of productive forces.

Agricultural production has also developed rapidly through the improvement of productive forces. Grain output increased by 16.392 million tons from 113.18

million tons in the three-year period from 1949 to 1952, an increase of 44.83 percent, 11.3 percent over the highest annual output before liberation. Cotton increased from 444,000 tons in 1949 to 1.304 million tons in 1952, an increase of 1.9 million tons. Four times, 53.6% higher than the pre-liberation maximum output. [3]

Greatly promoted the smooth progress of the liberation war.

With the victory of the land reform, the feudal exploiting class was extinguished, the farmers' enthusiasm for production and political awareness were improved, and the agricultural productive forces were greatly strengthened. In all the liberated areas, the masses of the people support the Communist Party of China and defend the fruits of victory. . This marks a profound significance for the implementation of the land reform of the liberation war for the victory of the whole country.

First of all, the social status of workers and farmers has been consolidated in the land reform, laying the foundation for the liberation of China. The agrarian reform movement realized the desire of the working people for land freedom and ended the oppression and destruction of the feudal landlord class. Since then, farmers have turned over to become the masters of the country, their political and ideological awareness has also been improved, and they have actively participated in and supported all the principles and policies of the Communist Party of China system. They are willing to give everything only for the victory of the liberation war. As a result, the democratic regime in the liberated areas was consolidated and the political basis for the victory of the liberation war was laid.

Second, rural productive forces have also been greatly developed in land reform, stimulating farmers' enthusiasm for production and providing material security for the liberation war to ensure an adequate supply of military supplies. After the land reform movement, farmers have great enthusiasm to strengthen production after receiving land, which provides a solid backing for the liberation war and a great improvement in the economic outlook of the countryside. For example, according to incomplete statistics, even the people in Shandong liberated areas sent 81.5 billion jin of grain to the front line of the war, supporting 8,68,238 catties of salt, 72,256 kilograms of cooking oil and a large amount of vegetables. The women in the administrative region, such as Bohai, Luzhongnan, Jiadong and other areas, made 22,1809 pairs of military socks and 7622,151 pairs of military shoes. The army was sent to the army 1778855 beds and 735573 sets of military uniforms. In addition, the people of liberated areas such as Jinsui, Huazhong, Jinchaji and other areas also transported a large amount of material resources for the war. During the three major battles of Liaoshen, Huaihai and Pingjin, the peasant masses in each liberated area only supported the war: 95 million catties of grain, 430,900 carts, 117,700 stretchers, and 1036,300 livestock.

It can be seen from these data that the implementation of land reform has guaranteed the material consumption of the liberation war. The thoroughness of land reform during the liberation war was not only the historical task

of the current Chinese revolution, but also the basic condition for the Communist Party of China to defeat the enemy.

Finally, land reform provided a large amount of human resources for the liberation war. Land reform during the liberation war was a profound change and a difficult struggle for the rural land system. Only through the war can farmers win the fruits of victory. Therefore, the majority of farmers should take the initiative to participate in the anti-Japanese war. Take the liberated areas of North China as an example, nearly one million farmers in the region participated in the Anti-Japanese War. At the end of 1947, there were about 300,000 farmers registered in the Jin-Hebei-Yayu border area alone, and 160,000 farmers finally approved it. In one month of the summer of 1948, 6,011 people joined the army in Jinsui Border Area, and 30% of the people signed up voluntarily. About 1.6 million farmers joined the anti-Japanese army in the Northeast liberated area. The front-line support of the militia district is also seen by farmers. They played a great role in the front-line team in order to undertake the task of fighting. The number of militiamen carrying out logistical tasks during the three major battles was 8.57 million. They participated in 14.14.7 million major and small battles, and 22.28.4 million militiamen participated in the battle, destroying a total of 21.47 million enemies. One of the necessary conditions for the victory of the liberation war is the enthusiasm of farmers to join the army.

The victory of the agrarian revolution and the victory of the new democratic revolution are closely linked. A large number of people have completed the land reform in northern China, and the great victory of the liberation war can only be achieved through them. Only when the agrarian revolution wins can the great victory of the revolution be won.

4.CONCLUDING

From the perspective of modern Chinese history, how to solve the land problem of farmers in the revolution must be considered, because it occupies a pivotal position. If you don't understand the national conditions, solve the farmers' land problem, or even solve the farmers' land problem well, they will not be strongly supported and supported by the peasant masses, and will not successfully complete the ongoing revolutionary tasks, and may be abandoned by the people; conversely, they will clearly understand the national conditions. If we solve this vital problem well, we can win the love and support of the people in the end. During the Kuomintang's rule in mainland China, they received strong support from imperialism and feudal forces. Even if they had a strong army and regime, they never had a strong solution to farmers' land. The end result was abandoned by the people and expelled from mainland China. But the Communist Party of China is well aware of the importance of solving the peasant problem. Focusing on this issue, it carried out the agrarian revolution, rent reduction and interest rate reduction and land reform, and finally won the victory of the democratic revolution.

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Reflection on Piano Curriculum Mode in Colleges and Universities Under the New Crown Epidemic Situation

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Abstract: Since the outbreak of Covid-19 virus in late 2019, primary and secondary schools across the country have cancelled face-to-face courses and switched to online education to realize "teaching without stopping". In the first semester of 2020, the education and teaching of colleges and universities all over the country are facing great challenges and problems. The study according to the objective practice of the author, a professor of piano course in colleges and universities, according to the online education teaching theory, giving full play to the advantages of online education teaching, analyzes the outbreak period the advantages and disadvantages of online teaching piano course, reflects on the outbreak period after the piano course mode, teachers and students in colleges and universities teaching organization and management of urgent need.

Keywords: College Piano; Curriculum Model; Covid-19; Online Teaching

1. QUESTIONS RAISED

Since the COVID-19 outbreak in late 2019, nearly 200 countries around the world have partially or completely closed schools, leaving hundreds of millions of students unable to attend school. This sudden global public health event triggered a rare school closure and switch to online education in the history of global schooling. As of March 4, 2020, 22 countries on three continents had announced or implemented school suspensions, according to the United Nations Educational, Scientific and Cultural Organization. The crisis has affected nearly 363 million students worldwide, including 57.8 million in higher education, from pre-school to higher education.

During the epidemic, many universities and primary and secondary schools in China began to suspend classes and carry out online teaching. The overall level of social informatization is deeper than ever before. From traditional courses to mooc and micro courses, the normal communication between teachers and students has changed from offline to QQ and WeChat... These changes a strong impact on the active in the front line of teaching, teachers have forced them to jump out of the nest mortar of traditional teaching, establish a correct concept of modern education, continuously improve their information literacy teaching, effective ways and means to promote the modern education technology and the integration of classroom teaching and explore new teaching mode, to adapt to the requirements of information age, information technology has become

increasingly obvious influence on education of revolutionary. Colleges and universities are in the forefront of research and dissemination of advanced science and technology, the birthplace and pioneer of educational technology in various countries, and have a strong driving force for educational informatization. In this process, the information construction of colleges and universities can advance by leaps and bounds: after teachers have the information literacy, they have the consciousness and ability to create information teaching courses; The popularization of network technology makes resources more likely to be Shared and utilized. The construction of Shared resources and the reasonable development of high-quality teaching videos and other resources.

The author as a piano skills course of university teachers, during the outbreak of distance education, information technology, a professor of piano course in a semester, summarizes the piano course of information technology in the online teaching, the effect is shown in figure: realize the personalized teaching based on network teaching platform, the teacher released all kinds of knowledge learning, including video, PPT document, form of courseware in-class self-test questions, answering questions online discussions, unit operations, unit test and final exam. Students can take relevant knowledge points in the network to study at any time according to their own needs, check the loopholes and fill the gaps, guide students to conduct targeted personalized learning and research learning, and stimulate students' initiative and enthusiasm in learning.

1.1 Assessment standardization

In the traditional piano examination, teachers of various majors show students' performance ability and judge them subjectively. Each teacher's assessment focus is different, the score naturally have high and low. In the network teaching, most of the students through the wisdom of the test platform, through the electronic files of the test, the content of the assessment. The piano test is not entirely a content of theoretical knowledge, it includes video, audio and work analysis and other skills and skills related to piano performance. The objective questions are completed by the computer, while the subjective questions are completed by the teacher. This online test standardizes the piano assessment standard and improves the fairness and accuracy of the score.

1.2 Make up the deficiency of theory

Traditional classroom teaching is mostly related to piano

practice. However, as a piano student, blindly playing without knowing the basic principles of piano playing will only worsen the performance. Online teaching makes every piano skill clearly displayed from theory to practice through the micro-instruction of piano performance details. Intuitive and three-dimensional piano performance and piano theory perfect combination. Various piano lesson, pictures, video, dynamic effect both highlight the key, and solve the difficulties, simplifies the piano teaching in teacher's theory in interpretation technique in the process, reduce the difficulty of the teacher's teaching, student learning, actively mobilize the student's image thinking ability in playing the piano, make up for the deficiency of the piano theory knowledge greatly.

2. DEFICIENCY OF PIANO IN COLLEGES AND UNIVERSITIES UNDER COVID-19

2.1 Insufficient skill practice

Because all the knowledge points are completed through "online learning" in the online teaching, and the piano itself really needs constant playing practice to become proficient in various finger skills, which reduces the practical operation of the practice part. The cost of learning the course online has increased and students must be equipped with practice pianos. While studying in school, the piano is already available when practicing in school. If students don't have a piano, they can't finish the practical homework assigned by the teacher. Even if there is a piano, students' mastery of piano skills is abstract, and teachers can only give Suggestions in videos. All of these are carried out on the Internet, which cannot be practiced face to face. The core part of the piano, the technical ability of fingers, needs to be completed independently by students, which is slightly less practical than the traditional course teaching.

2.2 Slow performance improvement

The traditional piano class mainly adopts the form of teacher's lecture + students' classroom practice, such as the basic skills of piano. When it comes to the playing mode of scales, the teacher will demonstrate playing in class, the students will play by themselves in class, and the teacher will check the students' mastery. In the online teaching, the theoretical knowledge of scales will be very thorough, with videos and pictures. In the part of returning homework, the teacher watches the video of each student to understand the students' master situation. In the process of students' video recording, not every student can accurately record the videos that the teacher needs to see, which also leads to the fact that the teacher cannot be very prepared to understand the knowledge of this scale. However, if each skill point is not well mastered, it is bound to have a certain influence on the next knowledge point. Therefore, students' piano performance ability cannot be improved rapidly.

2.3 Low student interaction

Information-based teaching, through the network teaching platform, can be completed through the form of independent learning + teacher-student interaction, but on the platform between students and students communication and exchange enthusiasm is not high. All

the learning content is placed on the network by teachers through various auxiliary tools. Students do not need to communicate and interact with each other, they only need to learn according to certain standards. In traditional piano teaching, the students play each other between is a kind of very good piano learning process, it can improve the aesthetic taste of the piano music, is an important approach to cultivate our hearing, and encourage students listen more thought and inspire each other, between which one of the important means to improve the level of playing the piano. From this point of view, the interaction between students and students in the network teaching is slightly inadequate.

3. THE REFLECTION

After a full semester of piano network teaching, the author has the following experience:

3.1 Mixed teaching is more conducive to students' learning of piano skills

The piano courses in colleges and universities are divided into two types: general courses and major courses. Since most piano students in colleges and universities do not have piano courses, it is a top priority for students to complete the basic piano courses with "high efficiency and low consumption". It is also a problem faced by piano skill teachers in colleges and universities that major students often attach more importance to skills than theories. Based on the new teaching mode of network platform information, the traditional piano classroom is combined with networked piano teaching: through personalized learning, participatory teaching and process evaluation on and off line, students can have a full understanding of the piano technology they have learned, and form an "open, three-dimensional and multi-dimensional" piano course teaching system. At the same time, students love learning and enjoy learning by using the blended teaching method. They constantly reflect on themselves, repair themselves, adjust and monitor the learning effect, improve the learning efficiency, so that they can complete the piano learning quickly and effectively, and promote the comprehensive development of piano learning.

3.2 Teachers' practical ability in information construction must be improved

During the epidemic, China began to suspend classes in February. Universities and primary and secondary schools began online teaching, and many people rushed into the studio. Many people simply understood online teaching as "live broadcast". With the addition of the Internet, piano teachers can conduct remote teaching, video teaching and regularly push piano learning feedback. The platform can also follow up students' piano learning practice throughout the course and adjust the piano teaching content timely. However, piano is a course with strong professional skills. Teachers' face-to-face demonstration in traditional piano teaching can enable students to have a more intuitive understanding of the sound changes brought about by various playing methods, discuss the differences between the expressiveness of composers' works and music, and even the most basic reading of music can be corrected in the first place. 3.3 Ability problems of schools in the new

normal of piano curriculum informatization

In the new environment of "Internet +", Internet teaching resources, platforms, systems, software or videos will change the original teaching ideas and teaching methods, and promote the revolutionary change of traditional teaching. "Internet + education" broke through the traditional teaching method, the framework of the interactive learning possible, by "Internet + education" to create a kind of information sharing, mutual communication, mutual cooperation and interactive learning environment, so as to realize online teaching, management and online interactive online interaction, overcome the limit of time and space, make the learners in the process of interactive learning to achieve the desired effect. "Internet +" enables educational opportunities, challenges and countermeasures to achieve the expected learning effect in the interactive process. In college piano courses, the advantage of traditional classroom learning lies in intuition and sensibility, while the quality of online learning lies in openness and multi-dimension. How to make the piano courses seamlessly connect online and offline, build a good network platform, enable teachers and students to have a high degree of participation, and acquire a more comprehensive knowledge system, all depends on the importance attached by schools, and is also the key to realize the informatization of skilled courses in the post-epidemic era.

4. CONCLUSION

Under the cloud of the COVID-19 epidemic, many educators are constantly asking, in the post-epidemic era, what is the future of school education at all levels, including basic education, higher education and vocational education? How should the informationization of education rely on educational technology? With the continuous deepening of teaching informationization reform, new teaching concepts have been deeply rooted in the hearts of college teachers, especially young teachers, who have been able to skillfully use educational technology for teaching. Teachers who teach piano

courses in colleges and universities generally have higher academic qualifications, strong piano performance ability and strong learning perseverance, and seldom have studied modern educational technology theory. Moreover, piano teachers have their own experience in piano teaching, and they usually need to understand information-based teaching based on their own experience. They usually study with the practical needs of their profession and problems to be solved in their work. Most of them hope to put what they have learned into practice and have a strong learning purpose. The piano skill needs not only the oral transmission of traditional schools, but also the personalized education of network learning. As Part or all of China has resumed classes, students have returned to campus to begin face-to-face instruction. Through the study of teaching effect, the new normal information teaching mode should be obtained. The new personalized learning, participatory teaching and process evaluation based on the Internet run through the whole process of basic piano course teaching, reforming the original teaching method and enriching the piano course content.

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Cultivation of Students' Innovative Ability in Inorganic Chemistry Teaching Based on Less Class Hours

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Abstract: With the development of modern society, enterprises put forward new requirements for the innovation ability of talents. Inorganic chemistry, as an important subject of Chemical Engineering Specialty in higher vocational colleges, teachers should use limited class hours to cultivate and exercise students' innovation ability, so as to better adapt to the needs of enterprises and the development of the times, and lay the foundation for students' future development.

keyword: Higher Vocational Education; Inorganic Chemistry; Innovation Ability; Training Strategy

1. ADJUST THE TEACHING CONTENT

Inorganic chemistry is an important subject of Chemical Engineering Specialty in higher vocational education. Its educational purpose is to help students master the basic theory and concept of inorganic chemistry, master the properties, composition and structure of compounds, have certain chemical principle analysis and cognitive ability, and can flexibly apply the knowledge to solve production problems. Due to the short learning time in Higher Vocational Education and the limited inorganic chemistry class hours, teachers should use the limited class hours to consolidate students' Inorganic Chemistry Foundation, pay attention to the cultivation of innovation ability, promote students to obtain professional quality and innovation ability, and then better face the employment competition in the future.

1.1 strengthen basic knowledge

The development of innovation ability should be based on students' knowledge and skill system. Basic knowledge is the key to the development of innovation ability. Therefore, teachers should pay attention to strengthening basic knowledge and highlighting its importance in adjusting teaching content. In classroom teaching, teachers should fully combine chemical experiments with theoretical knowledge, and promote students to master basic knowledge such as redox, solution theory, chemical equilibrium, kinetics, thermodynamics, material structure, element cycle, etc. At the same time, under the guidance of theoretical knowledge, students are required to master the use, structure, preparation and existence of compounds, and understand the chemical properties and change rules of compounds.

1.2 introduce the history of Chemistry

Due to the limited teaching hours of inorganic chemistry in higher vocational colleges, many teachers ignore the history of chemical development in order to catch up with

the teaching progress. In the history of chemical development, it introduces the path of success, philosophy, research methods and scientific spirit of Chinese and foreign chemists, which helps to inspire students' innovative consciousness. Therefore, teachers should pay attention to the importance of this part of the content to the cultivation of innovation ability, arrange the class hours reasonably, help students understand the development history of inorganic chemistry, stimulate students' interest in inorganic chemistry, and actively carry out innovation in learning.

1.3 integrating the frontier knowledge of the discipline

In the development process of inorganic chemistry, new knowledge, new theories and new materials are constantly emerging. Based on the characteristics of higher vocational education, teachers should integrate the cutting-edge knowledge into the classroom, and show more new discoveries and new achievements to students, such as nano materials, bio inorganic, ecological protection and environmental pollution, so as to broaden students' knowledge horizons and help them form innovation consciousness.

2. REFORMING TEACHING METHODS

2.1 encourage students to question

Teaching activities are to promote students to master basic knowledge, solve practical problems, put forward personal ideas and complete classroom interaction under the guidance of teachers. But in the past, due to the limited class hours, teachers mainly use the way of indoctrination to complete the knowledge transfer, and lack of interaction with students. In the cultivation of innovation ability, teachers should encourage students to put forward personal questions boldly, and give answers to students' questions, so as to promote students to form innovative ability in questioning.

2.2 organizing class discussion

Classroom discussion helps to activate the classroom atmosphere, help students to ease the tension caused by class, students in a relaxed environment, can stimulate enthusiasm and interest in learning, help students to think innovation. For example, in learning the knowledge point of "preparation of nitric acid", teachers can ask questions and organize students to discuss freely: in industrial production, why not prepare nitric oxide by direct reaction of oxygen and nitrogen? After asking questions, teachers should leave classroom time for students, and encourage students to use network query, data calculation and other methods to get answers. Through classroom discussion, students can better apply theoretical knowledge and obtain

the development of innovative thinking in the connection between production and theory.

2.3 effective combination of teaching and research

Many chemistry teachers in Higher Vocational Colleges undertake certain scientific research tasks. In the cultivation of innovation ability, teachers should pay attention to the combination of teaching and research, bring students into the laboratory, and impart knowledge in the laboratory as a classroom. Under the influence of strong scientific research atmosphere, students can establish correct scientific research knowledge and innovative spirit, which is helpful to form their innovative ability. For example, in learning the knowledge point of "acid-base balance", many theories involved have the background of the times, such as molecular orbital theory. Teachers can use the equipment in the laboratory to carry out paramagnetic experiments, so that students can master the existence of unpaired electrons in oxygen molecules.

2.4 focus on inspiration and guidance

Many higher vocational students have weak inorganic chemistry foundation. Teachers should consider the characteristics of students in the cultivation of innovation ability, and pay attention to the way of inspiration and guidance to promote students to master basic knowledge and obtain the development of innovation ability. For example, in learning the knowledge of "the arrangement of electrons outside the nucleus", the teacher can ask the question: Why did the atom lose the outer electrons first? Through this question, students can be guided to think on their own initiative and try to answer them with the knowledge they have learned. Under the long-term inspiration and guidance, students can form correct thinking habits, which is the basis for the development of innovation ability.

3. ATTACH IMPORTANCE TO CHEMICAL EXPERIMENT

3.1 exercise basic ability

Due to the limited class hours, teachers in the past did not leave more time for students to operate on their own in histochemistry experiments, which mainly focused on Teachers' demonstration and students' imitation. Based on the experimental teaching with less class hours, teachers should reduce the demonstration time, provide the students with the correct operation mode in the form of micro class before the experiment, and the students can watch independently in their spare time and operate independently in the experimental classroom, so as to form the correct operation consciousness and habit, and lay the foundation for the formation of their innovation ability.

3.2 encourage independent innovation

Based on the differences between different students in innovation ability and innovation, teachers should encourage students to make bold and independent innovation in histochemistry experiments, and promote them to form a certain sense of innovation and research

habits. For example, teachers can design creative experiments according to the experimental content, require students to flexibly choose chemicals and complete experiments according to the experimental requirements, and elaborate the experimental situation and innovative ideas. Creative experiments can stimulate students' enthusiasm for the operation of chemical experiments, and have the effect of enlightening thinking.

3.3 design exploration experiment

Experiment is a key part of inorganic chemistry course, and it is also an important way to cultivate innovative ability. Teachers should abandon the previous solidified experimental teaching mode, design experimental content with exploration value combined with the characteristics of higher vocational education, scientifically group students, and require students to carry out experimental exploration in the form of groups, and complete the experiment with the knowledge and skills they have learned. In designing exploration experiments, teachers should respect students' experimental ideas and innovative ideas, promote students to form original, divergent and flexible thinking, and lay a solid foundation for the development of their innovative ability and scientific research ability.

4. CONCLUSION

In a word, higher vocational education is an important base for training and transporting modern and high-quality talents for China's social production. Inorganic chemistry is a basic course for chemical engineering majors. Teachers should combine the market demand for talents, constantly tap curriculum resources, strengthen the training of innovation ability, and promote students to form the innovation ability that matches the job requirements and the development of the times, so as to better serve the future of students to lay the foundation for employment.

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Research on The Training Ways of Practical Operation Ability of Accounting Major Students in Colleges and Universities

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Abstract: Accounting major is involved in the calculation of enterprise financial statements and financial statements, as well as the study of the assets and income of enterprises in the business cycle. As the accounting profession requires highly professional ability and quality of accountants, colleges and universities need to train students' professional quality and practical operation ability when cultivating students majoring in accounting. However, in the traditional teaching process, there are many problems in Colleges and universities, such as the lack of teachers, the outdated teaching evaluation system and the lack of practical operation courses. These problems lead to the weak practical ability of accounting students. Therefore, colleges and universities need to find appropriate measures to deal with these problems and solve them timely and effectively, so as to ensure that accounting students not only have achievements in academic ability, but also have certain experience in practical operation, so as to provide guarantee for their future work. This paper starts with the reasons for the lack of practical ability of accounting students in Colleges and universities, and discusses the ways to cultivate the practical ability of accounting students.

keyword: College; Accounting Major; Practical Operation; Way

1. CONTENT OF PROFESSIONAL ABILITY OF ACCOUNTING STUDENTS

In 2014, the State Council put forward the training policy and plan for accounting students in Colleges and universities for the accounting industry. The plan clearly proposed that accounting students should be trained into professional talents with excellent professional quality and practical operation ability. Accounting practice is one of the most important standards in accounting teaching. Therefore, in the teaching process of colleges and universities, the cultivation of students' practical ability should run through the whole process of teaching, and the practical ability and theoretical teaching should be put in the common important position.

In recent years, with the rapid development of economy, under the new normal of economy, the state has issued new requirements for accounting major, and has planned in detail the three abilities that accounting students must possess. The first ability is the qualification of accounting students. Because the accounting industry needs practitioners to have the corresponding professional ability and qualification certificate, the professional qualification certificate is also the guarantee of accounting

students' professional ability [1]. The second ability is the professional quality of accounting students, accounting students not only need to have excellent professional ability, so that they can ensure the completion of enterprise financial related work in the future work. In addition, more important than professional ability is the professional quality students need to have. In recent years, the criminal cases committed by financial personnel of some enterprises are endless, which is the reflection of the lack of relevant professional quality of accounting personnel. Therefore, relevant colleges and universities should pay attention to the cultivation of students' professional quality, so that they can abide by the relevant rules and ensure the integrity of work. In addition, another ability is the management ability of accounting students, accounting students not only need to have the corresponding professional ability and professionalism, but also need to have a certain management ability, because accounting work in the long-term work process, will face complex work content and need to be treated strictly data, and for the future career planning students should also have the ability. Certain management ability. Therefore, the school should cultivate the students' abilities in some ways to make them more proficient in the future work process, be able to flexibly deal with some problems in the work, and deal with them through their own learning.

2. THE REASONS FOR THE LACK OF PRACTICAL OPERATION ABILITY OF ACCOUNTING MAJORS IN COLLEGES AND UNIVERSITIES

(1) The teaching staff has relatively shallow qualifications and insufficient ability

Under the guidance of the national training policy for accounting students, the school also attaches great importance to the cultivation of students' relevant ability. But in the process of training, there will be many problems, the most important one is the lack of comprehensive ability of teachers. Among the accounting teachers in Colleges and universities, most of them are fresh graduates or graduate students, so their practical experience and practical ability are relatively scarce. Therefore, colleges and universities pay more attention to the teaching of relevant theoretical knowledge when teaching accounting majors, but there are some negligence in the teaching of practical operation related ability. The lack of accounting experience of accounting teachers in Colleges and universities directly leads to that they only carry out some written teaching and pay attention to theory. However, accounting is a discipline

that requires practical operation ability. Therefore, colleges and universities need to innovate the teaching staff and introduce fresh blood.

(2) The teaching assessment method is backward

Another major factor affecting the practical operation ability of accounting majors in Colleges and universities is the backward teaching and assessment methods in Colleges and universities. The assessment method of colleges and universities is "classroom performance + final examination results". Such a traditional assessment method also makes college teachers ignore the cultivation of students' practical operation ability. Not only that, but also breed some bad phenomena, such as leading students to form the thought of "only score theory, only score theory", and only want to achieve a good result [2]. In class, students focus on class check-in and ignore the learning of class content. When they are unable to attend class, they even look for someone to sign in for them. In the long run, this phenomenon is more common, which seriously disrupts the classroom order, leads to the chaos of the style of study, and students ignore the learning content.

(3) There are few practical operation courses

In most colleges and universities in China, the lack of practical operation courses is also the reason for students' weak practical ability. Accounting major has higher requirements for students' practical ability, which requires students to carry out corresponding practical training. Only in school, students can have certain practical experience, then in the future work can they be handy and flexibly deal with some financial problems. However, in Colleges and universities, due to the lack of teachers in Colleges and universities, and the lack of experience in the practical operation courses of the accounting department, although some colleges and universities have set up relevant courses, they are still in the exploratory stage, lacking a systematic management experience. The lack of practical operation courses in Colleges and universities also directly leads to the lack of attention and interest of students for practical courses. Students' interest in practical courses is not high and attention is not enough, as well as less efficient practice courses, resulting in students' general practical operation ability [3].

3. WAYS TO CULTIVATE THE PRACTICAL ABILITY OF ACCOUNTING STUDENTS IN COLLEGES AND UNIVERSITIES

(1) Improve teachers' practical experience and operation ability

For the lack of teachers in Colleges and universities, colleges and universities should pay attention to the problem. In the recruitment of teachers, we should not only pay attention to teachers' academic background, but also pay attention to teachers' practical experience. In addition, for the accounting teachers in Colleges and universities, the school should also organize relevant lectures and learning activities, invite experts and scholars from the accounting industry to give lectures in Colleges and universities, so that the accounting teachers can improve their academic ability

and learn some accounting experience. In the future teaching process, teachers can also carry out relevant case teaching, so that students can not only carry out some written learning, but also learn from practical cases, which can effectively stimulate the learning interest of accounting students, and also meet the new national teaching policy for accounting students. The improvement of teachers' practical experience and operation ability is of great help to improve the practical ability of accounting students [4].

(2) Reforming backward teaching methods and examination system

In the traditional assessment of accounting major in Colleges and universities, teachers usually use classroom performance and final examination results as the assessment method. For example, in order to get a good score, students will focus on some formal small things, such as answering in class. If the students can't sign in in time one day, they may even find someone to answer for themselves. Such a situation will also seriously disrupt the teaching order, not only can not achieve the purpose of classroom teaching, but also breed some bad habits, so that students can not learn the relevant learning content at all, but will form some bad learning methods, such as "fraction only theory". Therefore, in the future teaching process, the school should vigorously reform the teaching methods and assessment system, take some practical operation courses as the main teaching direction, and increase the cultivation of students' practical ability. In the final assessment process, the school needs to improve the assessment method, take the students' practical ability as the focus of the assessment, and organize some accounting related skills competitions to assess the students' practical ability [5].

(3) Enrich students' training projects and operation opportunities

Previously, colleges and universities used to pay attention to the cultivation of accounting students only in academic theory, but this kind of teaching form will cause many problems, such as students' lack of practical ability, single school teaching method and lack of classroom teaching vitality. Therefore, colleges and universities should improve teaching methods and actively carry out some practical activities, such as arranging students to practice in some enterprises, setting up accounting laboratories and carrying out practical training in the classroom. According to the characteristics of the accounting major, the school can actively carry out long-term cooperation with some enterprises, arrange accounting students to practice in enterprises, which can not only effectively exercise students' time operation ability, but also cultivate reserved talents for enterprises. In addition, the school should establish relevant accounting laboratory and introduce some hardware and software facilities to provide equipment guarantee for students' practical operation ability. In the classroom training, teachers can use Excel financial management application or financial management curriculum design, and comprehensive training can use advanced financial audit or ERP sand table experiment. In

some specific practice process, teachers can guide students to use computers to do accounts, so that students can effectively use the relevant electronic equipment. The above practical operation opportunities can effectively provide some practical operation platforms for students and effectively cultivate their practical operation ability [6].

4. CONCLUSION

In recent years, accounting fraud cases occur frequently in enterprises, and the state attaches great importance to such cases, and has issued specific training programs for accounting majors, which require students to have professional ability, professional quality and management ability. However, in the traditional accounting teaching in Colleges and universities, the school pays more attention to the cultivation of students' practical ability. The reasons for these problems are the lack of professional teachers, the lack of courses and the students' insufficient attention to practical ability. Based on the above problems, the school should take corresponding measures in time, by updating the teaching team, training teachers' professional ability, adding relevant practical courses and reforming the teaching evaluation mechanism of the college [7].

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Analysis of Influence Factors on The Credibility of Online Celebrity Marketing by Internet Celebrity Marketers Receiving Corporate Funding

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Abstract: People who have become popular through video social platforms rely on personal influence to gain the favor of enterprises, and conduct product marketing through the coupling of personal brand effects and corporate brand effects. Under this situation, the personal credibility of Internet celebrity marketers and corporate brand awareness have been enhanced in both directions, and they have good development prospects. This study takes the credibility of Internet celebrity marketers after receiving corporate funding as the main research object, and discusses it through quantitative analysis. Research shows that when the company's popularity is the same as that of the influencer, the credibility of the online celebrity marketer is relatively high; when the company's popularity is the same as that of the influencer's popularity but low, the credibility of the influencer marketer is lower. Based on the research results and the development trend of online celebrity marketers, this paper puts forward relevant suggestions to enhance credibility, such as promoting the personal branding of online celebrity marketers, promoting the professionalization of online celebrity marketing team operation, stimulating customer emotion through benign interaction, and implementing the centralization of online celebrity marketing platform.

Keywords: Online celebrity marketer; Enterprise funding; reliability; Influencing factors

1. DISCUSSION ON THE CONCEPT OF INTERNET CELEBRITY MARKETERS AND THEIR BUSINESS MODELS

In recent years, with the deep development of social media, great changes have taken place in people's work, life and social entertainment. For example, Taobao live broadcast, vibrato, Aauto Quicker and other media have become the most popular propaganda methods for obtaining and sharing information under the current social background by virtue of their visual and convenient sharing methods. In this context, a group of internet celebrity marketers have used online social media to carry out live broadcasts, and some film and television stars and singing stars have also participated. At present, with the continuous increase in the number and amount of online Red marketers, the connotative economic value of online celebrities is gradually recognized by social enterprises, and through cooperation with enterprises, the profession of online celebrity marketers is more professional. Recently, the

group of Internet celebrity marketers has rapidly emerged, but the research on this field is still in the preliminary stage. On the whole, although the academic research on this is relatively short-lived, there have been many research results in the related fields of online celebrities. The research on online celebrities started in 2015, including the rise stage, development stage, marketing methods and other dimensions, and most of them adopt empirical research, and the number of quantitative research is small. Under this situation, quantitative analysis is used to determine the factors affecting the credibility of Internet celebrity marketers receiving corporate funding, with a view to enriching research content in related fields.

1.1 The concept of online celebrity marketer

Due to the field of internet celebrity marketers and their rather complicated forms of expression, the current domestic academic circles regarding internet marketers have not formed a consistent, clear and scientific conceptual definition. Most studies have summarized the common and universal characteristics of the influencer group, and used it to describe the group of influencer marketers. Some scholars also expressed their own conceptual understanding of Internet celebrity marketers, believing that they are active on the Internet and can attract the attention of Internet users through the Internet, and then collectively refer to those engaged in sales activities. The article combines the concepts of Internet celebrities and marketers, and defines Internet celebrity marketers as: a group that has a certain reputation on the network platform and generates benefits through live broadcast of goods through the Internet. With the continuous development of Internet celebrity marketers, a diversified consumer market based on IP has gradually formed, and a new economic model has gradually formed. Internet celebrity marketers or their teams use IP influence to obtain economic benefits through specific realization methods. In today's situation where online celebrity marketers are quite common, fans can obtain a certain degree of convenience through online social media, enterprises can sell more products through online celebrity marketers, and online celebrity marketers themselves can obtain certain economic benefits.

1.2 Discussion on the business model of Internet celebrity marketers

In the general development period of Internet celebrity marketers, the entry barriers of Internet celebrity marketers

are relatively low. It only needs to publish works and sell products through a network device to obtain economic benefits to develop into an online celebrity marketer. At this stage, the domestic Internet celebrity marketer market is developing rapidly, and the structure of the Internet celebrity marketing industry is also constantly improving, gradually turning to brokerage companies for professional services. The higher the number of fans of high-end Internet celebrity marketers and the higher the reputation of the connected company, the stronger the ability to attract traffic. For those who have not accepted the operation of brokerage companies and have not yet cooperated with enterprises, the more difficult it is to attract traffic. In fact, as early as 2009, the United States relied on YouTube to innovate and construct a new type of business form, with brokerage companies connecting enterprises and forming a professional operation model. Domestic scholars classify the business model of Internet celebrity marketers, and divide them into four forms according to the operating model: Taobao's transformation of e-commerce, financing and entrepreneurship, endorsement of corporate brand sales, and brand cooperation to earn advertising expenses. After an in-depth analysis of the business model of internet celebrity marketers, it is not difficult to see that internet celebrity marketers are developing systematically and compliantly. But at the same time, it is not clear whether there is an impact on the credibility of the online celebrity marketers receiving corporate funding.

2. QUANTITATIVE RESEARCH DESIGN

2.1 survey design

In order to study the influencing factors of the credibility of online celebrity marketers receiving corporate funding,

this paper analyzes it through questionnaire survey. Therefore, the article is based on the maturity scale of corporate reputation, corporate product types, online celebrity marketers and product fit, and consumer purchase intentions, and makes corresponding adjustments and modifications to the actual development. Based on the survey design ideas of most domestic scholars, the Likert 5-level scale was selected. This questionnaire survey is divided into the following four steps: previous research combing, initial questionnaire setting, pre-survey analysis, and formal questionnaire generation. Based on the above principles, this research questionnaire is composed of the following three parts. The first part is a screening item, through which the marketing personnel of online celebrity marketers who have not received the financial support from enterprises will be eliminated. The second part is basic information, including business operation information, basic business information, personal information of Internet celebrities, and basic consumer information. The third part focuses on consumer perception, and counts the marketing quality, personal emotional response, and purchase intention in the process of users receiving and corporate sponsored Internet celebrity marketers.

2.2 Variable definitions

The article research model involves business information, basic business information, personal information of Internet celebrities, basic consumer information, marketing quality, personal emotional response, and purchase intention. The definitions of different variables and source definitions are shown in Table 1.

Table 1 Variable definition details

Variable definitions	
Business information	Business product type, general sales volume, general sales volume
Enterprise basic information	Enterprise establishment time, enterprise reputation
Personal information of online celebrities	Number of followers of influencer marketers
Basic information of consumers	Consumer age and income level
Marketing quality	Final product sales volume and total sales price
Personal emotional response	Consumers' perception of the emotional appeal of the corporate products marketed by influencers
Consumers' purchase intention	Consumers' purchasing intentions considering corporate and internet celebrity effects

2.3 Variable measurement

The article adopts the maturity scale in the past research and revises it according to the actual situation to make its variables conform to the actual situation of this research, as shown in Table 2.

2.4 Pre survey

In order to ensure that the items measured in the questionnaire can accurately convey the meaning of the survey, a small-scale pre survey was carried out before the research. Through the third-party survey of "questionnaire star", 100 questionnaires were released. Among the respondents, 55 respondents had contacted with online celebrity marketers sponsored by enterprises. After eliminating invalid questionnaires and invalid data, a total of 51 valid questionnaires were collected.

2.5 Quantitative analysis results

According to the results of the questionnaire survey, business information, personal information and basic information of consumers will significantly affect the credibility of online celebrity marketers after receiving corporate funding, which is reflected in marketing quality, personal emotional response, consumer purchase intention and so on. According to the results of the questionnaire survey, the final conclusion of the paper is as follows. First, when the popularity of enterprises is the same as that of online celebrities, the credibility of online celebrities is relatively high. The direct performance is the improvement of marketing quality, the enhancement of consumers' purchase intention and the good personal emotional response. In addition, when the popularity of the second website is lower than that of the red net, the credibility is lower. The direct performance is the decline of marketing quality, the general purchase intention of consumers and

the general personal emotional reaction. Among them, the influencing factors of personal information degree of online celebrities are 60%, the influence degree of

enterprise business information is 30%, and the basic information of consumers is 10%.

Table 2 Modified variable definition

Variable definitions	
Business information	Business products are generally needed types
	The number of product sales is the normal business sales range
	The product sales price is within the normal range
Enterprise basic information	Enterprise establishment time is more than 1 year
	The total economic volume of the enterprise exceeds 10 million
Personal information of online celebrities	Number of followers of influencer marketers
Basic information of consumers	Consumer age (20-30)
	Consumers belong to the middle income level
Marketing quality	Final product sales volume
	Total sale price
Personal emotional response	Feeling excited when touching the product
	Feeling excited when touching the product
	Feel happy when touching the product
Consumers' purchase intention	I want to buy this product in the end
	Finally change the view of product manufacturing enterprises

3. SOME SUGGESTIONS ON IMPROVING THE CREDIBILITY OF ONLINE CELEBRITY MARKETERS ACCEPTING CORPORATE FUNDING

3.1 Promote the personal branding of online celebrities

For consumers, the first point of consumer behavior is not to pay attention to the companies behind the influencer marketers, but the personal IP charm of the influencer marketers. Therefore, if you want to effectively improve the credibility of Internet celebrity marketers in accepting corporate funding, you first need to improve your personal IP brand, and then turn it into a brand effect. In its current form, the overall development of Internet celebrity marketers needs to be based on social platforms. Therefore, Internet celebrity marketers need to make rational use of social platforms, show a healthy lifestyle and reflect a good positive energy mentality. Secondly, Internet celebrity marketers need to continue to enrich themselves and transform from pure online consumption to cultural influence on consumers. Finally, Internet celebrity marketers should establish a good brand awareness, weaken themselves, strengthen the brand in publicity activities, and realize the core transformation of "product speaking".

3.2 Promote the professionalization of online marketing team

Whether the consumer's final consumption behavior occurs depends largely on the product brand effect. On the one hand, consumers have a relatively complete understanding of the product brand system and can consume with confidence; on the other hand, online celebrity marketers convey their values and social cognition to consumers through their brands. Therefore, it is inevitable to promote the professionalization of online celebrity marketing teams. First, build healthy and orderly corporate brand connections through professional operations. A good corporate reputation and the credibility of Internet celebrity marketers require stereo consumers' trust and satisfaction with the brand. Second, optimize the previous single cooperation model of "one person, one company" and establish a "one-to-many" operation mode.

And with the help of current big data technology and cloud technology data integration advantages, through promotion and supply chain integration to provide convenience for consumers, and effectively improve economic benefits. Third, strictly control the production links through specialized operations to ensure product quality.

3.3 Stimulate customer emotion through positive interaction

Although the live interaction of online celebrity marketers cannot directly affect consumers' purchase intention, it has a direct effect on consumers' brand recognition and emotional behavior. The online celebrity sales with "sharing" as the core method have the characteristics of a social platform. Live barrage and comment messages have the function of "sharing", breaking through the inertial behavior of traditional word of mouth. The interactive operation of internet celebrity marketers is a characteristic feature of social media marketing, helping companies present the effects of a good brand. Therefore, the following strategy is proposed. The first is that Internet celebrity marketers should interact in a timely manner to enhance interaction with fans. The second is to pay attention to comments and product feedback, and communicate with consumers in a timely manner to deal with product issues, and improve consumer satisfaction. The third is to enhance the transparency of rewards and preferential activities. Encourage fans to know the authenticity of the event and turn fans into "consumers". In addition, it can also fully expand the age and occupation range of fans, and design products specifically.

3.4 Implement the centralization of online celebrity marketing platform

In fact, consumption traffic on any social platform will always turn to e-commerce platforms. Therefore, Internet celebrity marketers and funded companies need to clarify the importance of centralization of the marketing platform, so as to enhance the credibility of Internet celebrity marketers. On the one hand, companies need to do a good job on the e-commerce platform first to avoid consumers'

lack of awareness of brands and companies. Further cooperate with well-known online celebrity marketers to carry out marketing activities, and increase the trust of online celebrity marketers through two-way cooperation. On the other hand, Internet celebrity marketers can use social platforms to carry out appropriate advertising, design different product content, and meet the diverse consumer needs of consumer groups. In addition, online celebrity marketers can also use social platforms such as Weibo and Zhihu for daily sharing to enhance fans' awareness of the company, themselves, and products.

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Research and Implementation of College Academic Early Warning System Based on Big Data

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Abstract: With the advent of the 5G era, it has also accelerated the iteration of information technology. Smart campuses in various universities are under continuous construction, and academic early warning is also an integral part of the smart campus. This article relies on the relevant technology of the Hadoop platform to research and implement the academic early warning system. By analyzing and judging data such as the grades and credits of the students at school, the learning situation and learning status of each student in each semester are evaluated, and the students with poor status are given academic warnings. Solve the problem of students' slackness, confusion, and indulgence in the learning process, which lead to the failure of the course and insufficient credits to graduate normally.

Keywords: Hadoop; Distributed Storage; Academic Warning

1. INTRODUCTION

The iteration of information technology is fast, and the smart campus is no exception. At present, the smart campuses of various universities are continuously optimized and constructed. As one of the modules of smart campuses, academic early warning is also undergoing rapid development. Because the data types of college students are relatively complex and the amount of data is relatively large, traditional relational databases can only analyze and process structured data, but for unstructured data, such as student online logs, it is not applicable. When the amount of data is large, there will be problems such as slower query speed. Choosing the Hadoop platform for architecture design solves these problems well. This system uses the HDFS distributed file system to store student data, uses HBase to process student data in real time, and uses HiveQL to query, avoiding the inconvenience of unstructured data reading and processing. The data analysis system filters out student data that requires early warning.

The system uses the Hadoop technology platform to effectively process the data of the students enrolled in the school, and make different early warning information according to the requirements of different colleges for students. At present, some early warning systems are basically "post-event early warning". For students who cannot graduate on time with insufficient credits or students whose grades fail to pass, such early warning cannot have a real early warning effect. This research is to change the "post-event warning" into "in-event warning"

and "pre-warning". Through comprehensive analysis of students' attendance, class attendance, Internet logs, and precursor course scores, the course may be Early warning is given to students who fail, and early warning to students who may not be able to graduate smoothly due to insufficient credits. While improving the management level of the school, it also effectively reduced the waste of resources and promoted the high-quality development of the school.

2. RELATED TECHNOLOGIES OF HADOOP PLATFORM

Hadoop is a framework for distributed processing of large-scale data in a computing cluster using a simple programming model. Hadoop technology is that each computer in the cluster provides computing and storage, and supports parallel expansion of one to thousands of computers, rather than relying entirely on a high-performance hardware support. Hadoop includes multiple technologies, such as HDFS, MapReduce, Flume, Hive, etc., as shown in Figure 1.

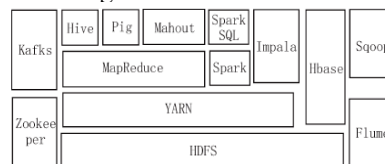


Figure 1 Hadoop framework

(1) Research on the principle of HDFS technology

HDFS is a distributed file system and one of the important components of the Hadoop platform. Multiple machines build a cluster and work together to solve the problem of distributed storage of data. HDFS adopts a master-slave architecture. An HDFS cluster has a master node and many slave nodes. The master node is mainly responsible for accessing and managing the file system from clients. The slave node is responsible for managing the running node storage, and the architecture is shown in Figure 2.

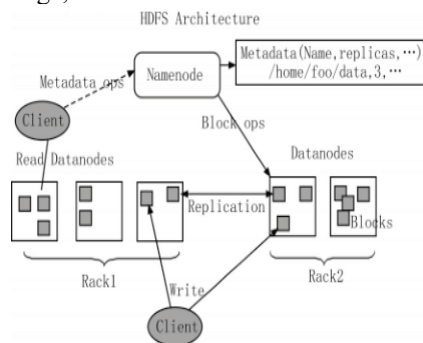


Figure 2 HDFS architecture

(2) Research on the principle of MapReduce technology
MapReduce is the soul of the Hadoop platform, responsible for the parallel processing and analysis of large-scale data. MapReduce consists of two parts, the map task and the reduce task. The map task first reads the data in the block and stores the data processing on the current node. Reduce is to pass the map data to the machine through the network and then sort it, and finally perform the Reduce operation. The principle is shown in Figure 3.

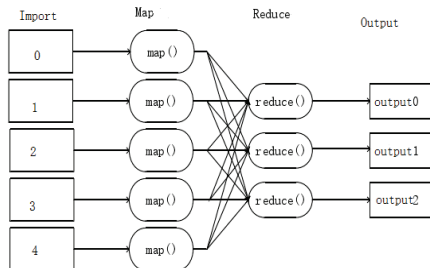


Figure 3 MapReduce schematic

(3) Other main technologies

HBase, a distributed column-oriented storage database. Applied to massive data storage, it can read, write and query data, and it can also perform quasi real-time query on massive data. This is very different from HDFS, but the underlying expansion of HBase depends on HDFS.

Hive is a data warehouse tool built on the Hadoop platform. It uses SQL statements to add, delete, modify, and analyze data in the HDFS database.

Hue is an open source visualization tool that uses Hue to visually analyze and display data.

3. DESIGN AND IMPLEMENTATION OF EARLY WARNING PLATFORM

(1) Overall system architecture

With the expansion of student enrollment, student data has also begun to explode. The system collects student data in all directions, analyzes the data and gives early warnings to try to prevent students from failing and not having enough credits to graduate. The overall system is divided into three layers: the data analysis layer, the data storage layer, and the data source layer.

The data source layer, mainly through the ODBC interface, calls other databases of the school to obtain historical score data, attendance data, credit data, etc. Through the Flume port, call the campus Internet behavior authentication system to obtain Internet log data.

The data storage design layer is mainly the calls between the various modules of the Hadoop platform, which effectively cooperate with each other to complete data analysis and processing together.

The data analysis layer mainly includes student performance early warning, online early warning, student attendance rate and pre-course performance, comprehensive evaluation of the current learning situation, so as to send early warning information to students who need early warning.

(2) Hadoop environment construction

The Hadoop cluster of this system is composed of ordinary PCs. In order to save energy, 3 cluster nodes are virtualized in VMWare. The cluster architecture is shown in Figure 4.

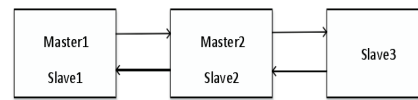


Figure 4 Cluster architecture

The entire cluster is composed of 3 servers, the first is deployed with a master node (Master) and a slave node (Slave), the second server server is deployed with another master node as the backup of the first server, and the first server is also backed up. Two slave nodes, the third server deploys the third and slave nodes.

(3) Early warning module of student performance

The system links the school attendance system and the educational administration system through the database interface, obtains the students' historical grades, precursor course grades, attendance and other information, and the online authentication interface log file, and imports the acquired data into HDFS. The system will comprehensively analyze and issue an early warning if it meets the conditions for issuing an early warning. The main code is as follows:

```
if(score ≤ 60) then
    if(onlineTime ≥ avg_t) then
        if(preference == 'game') then
            warn = 1;
            return warn;
        warn = 2;
        return warn;
    warn = 2;
    return warn;
print(" CN ")
return;
```

3.4 Early warning module for student credits

The main purpose of this module is to judge whether the student's performance in each semester meets the school's requirements, so as to give an early warning of whether the student can get the degree certificate in the final graduation. First, extract the student's student ID, historical score, class average, and Internet hobby from the early warning system database. After entering the system, it will judge whether it is below a certain score. If not, the system will mark it as a general. If the student's online behavior is biased towards games, the system will issue an early warning.

3.5 Early Warning Module for Students Online

The student's online module, the main one is the online log. Including students' online time and preference data. First of all, judge whether he spends such a long time online for learning or something else, and warn the students who have been online for a long time and whether they are studying. The first is to read the log data of students surfing the Internet from the data center to determine whether the duration is greater than a certain value. If it is greater, the analysis is biased toward learning. Otherwise, a warning message is issued.

4. SUMMARY

The advent of the era of big data has brought about the technology of processing big data sets. This research analyzes the data of colleges and universities based on Hadoop technology, and then analyzes and warns the students' academic work, improves the management level

of the school, and promotes the high school. Quality development.

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Research on the Practical Teaching of "Top Major" Course in Preschool Education in Universities from the Perspective of "Outstanding Teachers"

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Abstract: The construction of excellent preschool teachers is one of the key projects of the national education department to implement the "outstanding teachers", focusing on curriculum practice teaching. From the perspective of "outstanding teachers", the in-depth research on the practical teaching of "top major" in preschool education in universities is of great practical significance for the long-term development of preschool education major. In this paper, the development environment of preschool education specialty is analyzed firstly, and then the survival status of preschool education specialty is summarized. It is found that there are still many problems, such as the lack of professional concept, the weak link of curriculum practice teaching, and the lack of collaborative teaching. Finally, the paper puts forward some suggestions for improvement.

Keywords: Outstanding teachers; Preschool education; Top major; Practical teaching

1. RESEARCH BACKGROUND OF PRACTICAL TEACHING OF "TOP MAJOR" COURSE IN EDUCATION IN UNIVERSITIES FROM THE PERSPECTIVE OF "OUTSTANDING TEACHERS"

In August 2014, the Ministry of Education issued the "Opinions on the Implementation of the Excellent Teacher Training Program" (hereinafter referred to as the "Opinions"). The "Opinions" specified a comprehensive deepening of the teacher training model, and coordinated with local governments and kindergartens to build a new training mechanism to create compliance Professional teachers developed by the times. In addition, the "Opinions" pointed out that to promote the reform of practice-oriented "first-rate professional" courses, and the application of practice as the core guiding ideology for the training of outstanding teachers. The excellent teacher creation plan adopts a classified approach, and the training of excellent kindergarten teachers is a key project component of the plan. The preschool education major in universities is the main position for cultivating outstanding kindergarten teachers. It can also be said that the quality of the course teaching of this major directly determines the education level and the quality of talent training[1].

1.1 Overview of preschool education professional development environment

Teacher education curriculum should take solving practical problems as the core guidance and point to

teachers' practical teaching ability. In 2011, the National Education Bureau promulgated the "Teacher Education Curriculum Standards (Trial)", which emphasized that teacher education courses should focus on practical issues, and then learn and solve practical application problems. Subsequently, in 2012, the National Education Bureau promulgated the "Professional Standards for Kindergarten Teachers (Trial)", once again emphasizing the development concept of "combining preschool education theory with practical application, highlighting practical ability". It is pointed out that the preschool education major should organically combine theory and practice on the basis of ensuring the quality of teaching, and then continuously improve the educational model in practice. In 2014, the "Excellent Teachers" national policy project aimed at improving the teaching quality of teachers, and proposed that the core task of the current education reform is to improve the quality of teacher training, and professional targeted measures should be taken. In 2016, the national education department revised the "Kindergarten Work Regulations" and put forward detailed requirements for practical teaching, such as the introduction of teaching policies for different majors, which put forward higher requirements for teachers' practical ability. At this point, the state has basically completed the top-level design for the development of preschool education teachers. Under this background, a policy-guided and practical preschool education professional development environment is basically formed[2].

1.2 Overview of the survival status of Preschool Education Major

At this stage, the number of domestic preschool teachers is in short supply, and domestic higher education institutions have successively opened preschool education majors to meet the needs of teachers. However, due to the short course of development, the quality of preschool education majors is uneven, there are many problems such as lagging teaching methods and disconnection of teaching content. From this point of view, the preschool education major is in a forced survival state, which has a significant negative impact on long-term sustainable development. The "Excellent Teachers" project proposed in 2014, its core purpose is for teachers to consolidate the theoretical science and humanities professional foundation, and then rationally integrate the kindergarten stage teaching

professional standards into the curriculum system, enhance their outstanding development potential, and then realize the "excellent teacher" Training Program. To a certain extent, the "Excellent Teachers" project plan points out an optimized path for the survival status of preschool education majors. The preschool education majors in universities should uphold the development concept of "excellent teachers" and continue to promote professional practice teaching to promote local and colleges Coupling development of the three and kindergarten to cultivate future excellent kindergarten teachers[3-4].

2. THE PRACTICAL TEACHING DILEMMA OF "TOP MAJOR" FOR PRESCHOOL EDUCATION IN UNIVERSITIES

The implementation of the "excellent teacher" training plan for college teachers is to achieve high-quality pre-service training of kindergarten teachers. Further integrating the "Excellent Teacher" program into the "first-class professional" curriculum is the main driving force for the practice teaching of preschool education. In fact, the "first-rate professional" courses of preschool education, including early reading instruction, all have a considerable degree of practical teaching requirements. However, from the perspective of "excellent teacher" training, the practical teaching of "first-class professional" courses still has a significant gap with reality and faces many problems.

2.1 Absence of professional concept implementation

Based on the perspective of "excellent teacher" training, it is necessary to fully integrate professional concepts with curriculum practice teaching to build a comprehensive training system of "thick foundation, strong ability, and high integration" in universities. Furthermore, the integration of the curriculum concept of "first-class majors" with the actual work of kindergartens is the key to creating first-class preschool education specialization. However, most teachers have not participated in any teaching practice training before starting "first-rate professional" practical courses. Even if some universities carry out pre-employment training, most of them use concentrated theoretical learning as the basic content, and the training content is really less practical. This status has caused many pre-education majors in mathematics to have a weak sense of professional concepts, lack of scientific professional teaching concepts, and fail to clarify professional teaching goals. For example, in the course of early reading instruction, most kindergarten teachers equate it with general curriculum teaching activities and adopt collective reading. It has not taken the lead of diversified reading methods. It can be known that the concept of professional courses has not been concretely implemented in the practice of "first-class professional" courses. The lack of implementation of professional concepts has seriously hindered the improvement of the quality of preschool education "first-class professional" courses.[5-6]

2.2 Weakness of the practical teaching

At this stage, among the time teaching links of "first-rate professional" courses in universities, the main problem of the curriculum is that the time teaching link is slightly weak. On the one hand, the management level of

universities does not pay enough attention to practical teaching, and there is no series of methods such as practical teaching mechanism and practical teaching assessment in the teaching plan. On the other hand, preschool education majors are mainly composed of young teachers, and most of them are "from school to school, from desk to podium". The lack of practical teaching experience makes teachers not very aware of the characteristics of real kindergarten education and lacks in teaching. Practicing high-quality cases, there is also a lack of real cases as support in the "first-rate professional" courses, which makes it difficult for students to solve real problems in a timely manner. In addition, judging from the status of preschool professional education graduation, the direct result of weak practical teaching links is not knowing how to carry out practical courses and how to build a diversified teaching system, so that children ultimately cannot achieve enlightenment education. Furthermore, although kindergarten teachers have great enthusiasm for teaching, they have not created an objective environment suitable for teaching development according to the actual situation of children in the actual teaching process, and cannot reasonably grasp the actual teaching needs of children of different ages.

2.3 Lack of Collaborative Teaching

The practical teaching of "top major" of preschool education majors in universities requires the collaborative implementation of multiple subjects, which shows the importance of collaboration. However, judging from the actual development situation, the "top major" of preschool education in universities lack cooperation with other subjects in practical teaching. First of all, kindergarten cooperation is only a formality. For the practical teaching of "top major", it is necessary to build relevant training bases to help them carry out practical teaching activities. However, due to the limited number of kindergartens in the region, the number of kindergartens in cooperation with it is even smaller. Many pre-mathematics education students lack a practical base, and the improvement of practical teaching ability is superficial. Second, official government cooperation is rare. Local governments are responsible for education and training. However, the construction of specialized facilities is relatively small, which cannot meet the learning needs of children in various courses. Private education institutions also lack policy guidance and standards. Finally, cooperation between institutions is rare. For local universities, due to the constraints of development benchmarks and other factors, the level of universities running is significantly different. Universities should adopt a cooperative approach, learn from each others' strengths, and promote the development of universities. However, most universities have the concept of peer competition, and academic exchanges and school-running exchanges are rare.

3. SUGGESTIONS ON IMPROVING THE PRACTICE TEACHING OF "TOP MAJOR" COURSE IN PRESCHOOL EDUCATION IN UNIVERSITIES FROM THE PERSPECTIVE OF "OUTSTANDING TEACHERS"

The "Excellent Teacher" project plan points out the development direction for the practical teaching of "first-

class professional" courses in preschool education in universities, and its guiding ideology of "thick foundation, strong ability, and high integration" provides development concepts for the practical teaching of "first-class professional" courses in preschool education. In this regard, the following suggestions are put forward in view of the current practical teaching dilemmas of the "first-rate professional" courses in preschool education in universities.

3.1 Laying a solid foundation: clarify the teaching concept of "top major"

In the process of training talents in preschool education, college teachers, as the core guidance of the curriculum, play an important role in guiding the concept of "excellent teachers". Therefore, when the "first-class professional" curriculum of preschool education in universities is launched, college teachers should first understand the spirit of the series of policies on Teacher Education Curriculum Standards (Trial), "Kindergarten Teacher Professional Standards (Trial)", and use the policy spirit as a direction guide. Gradually become familiar with the core requirements and specific measures of preschool education, and then formulate the practical teaching goals of "top major". Another is the need to establish clear curriculum teaching goals and guide the development of their own ideas and goals. For example, in the course of Early Reading Guidance, we should establish a clear guide for children to develop good reading habits and enrich their thinking and imagination. Further, the thinking of improving reading ability will be in line with the specific operation, and the curriculum teaching goal will be realized as soon as possible.

3.2 Strengthening ability: implement the practice teaching of "top major" course

Earlier, the "Opinions on Vigorously Advance the Reform of Teacher Education Curriculum" had nothing to do with the reform of the teacher education curriculum system in universities, and the initiative to increase practical teaching hours was proposed. As the main guiding personnel in the educational situation, teachers should start teaching activities from both in-class practice and extra-curricular practice. On the one hand, the preschool teacher organization team in universities should hold meetings to scientifically and rationally design the teaching content of "first-class professional" practical courses based on the characteristics of the courses, and then construct a practical teaching plan from the shallower to the deeper. On the other hand, it is necessary to improve the extracurricular teaching mechanism to solve practical teaching that cannot be achieved in class. For example, by rushing to public and private kindergartens for internships, increasing contact with young children, fundamentally discovering specific practical requirements for students. In addition, in addition to internships in kindergartens, part-time teaching in other early education institutions can also enhance teachers' practical teaching ability.

3.3 Focusing on integration: promote the effective cooperation of multi-parties

To realize the training plan of "excellent teachers", we should start with the collaboration of universities,

kindergartens, governments, families and other parties, so as to cultivate high-quality kindergarten teachers. Universities should actively introduce outstanding early childhood teaching practice staff, encourage the younger generation of teachers to participate in learning kindergarten education practice, so as to promote teachers with high quality. Kindergartens should actively establish cooperation with universities to meet their own demand for teaching talents while improving the quality of talents. The government has issued specific top-level design plans for the construction of "first-rate professional" courses, and provided economic support for the construction of specific training bases. On the family side, it has established cooperation with parents of children in the cooperative kindergarten, telling them about the children's life characteristics and ability needs, and then designing practical teaching courses specifically to fully meet the practical teaching needs of "first-class professional" courses from the perspective of "excellent teachers".

4. CONCLUSION

With the in-depth development of education globalization, the reform of the education system further puts forward higher requirements for teachers. In 2014, the Ministry of Education of the People's Republic of China launched the "Excellent Teachers" project plan, which aims to improve the comprehensive level of teachers and promote the development of national education. Among them, the training of excellent kindergartens, as an important part of the "excellent teachers" project plan, should start with preschool education in universities to improve the quality of kindergarten teacher training. In this context, the article puts forward a solid foundation: clarify the teaching concept of "first-class professional" courses, strengthen ability: implement practical teaching of "first-class professional" courses, focus on integration: promote effective cooperation among multiple parties and other improvement opinions, with the hope of serving as relevant institutes. The school provides theoretical reference.

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Research on the Transformation of College English Language Teaching to ESP

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Abstract: With rapid economic growth, the process of global integration has accelerated, and many foreign-funded enterprises have gradually poured into China. However, the phenomenon of the lack of English-speaking talents in China is very serious, and it is difficult to match the needs of enterprises. The main reason is that the current English education in colleges and universities is based on basic and general English knowledge, the level of practical teaching is low, and the quality of teachers is uneven. Therefore, based on the existing literature, combined with the concept and type of ESP (Special Purpose English), this paper analyzes the problems existing in traditional English language teaching in colleges and universities, and then analyzes the specific transformation path of English language teaching to ESP in colleges and universities, in order to provide relevant researchers with relevant information.

Keywords: College English; Language teaching; ESP; Transformation research

I. RESEARCH BACKGROUND

1.1 Literature review

With the advent of the new century, the economy has promoted frequent exchanges between countries. As the most used language in the world, English is no longer a simple language, but an essential communication tool (Huang). And Zhang, (2018)[1]. In today's colleges and universities, the focus of English teaching is traditional basic English knowledge, but traditional English knowledge has gradually failed to meet this fast-developing society. In the process of English teaching reform in colleges and universities, special-purpose English is one of the most critical links. After ESP becomes an important direction for college English teaching reform, the choice of ESP curriculum teachers is also very important. ESP curriculum teachers are professional. Teacher commitment or English teacher commitment has always been a dilemma. Combined with the survey and analysis, English teachers are more suitable for ESP teaching tasks (Teng and Liu, 2015)[2]. By studying the teaching situation of ESP, we can find a model in which ESP teachers and basic English teachers can cooperate. Both parties can cooperate in language expression, needs analysis, situational online, and textbook writing and syllabus to promote special-purpose English. Development (Ji, 2011). At the same time, the teaching of ESP also puts high demands on teachers. It must not only have rich knowledge of English knowledge, but also be proficient in professional knowledge and become a comprehensive talent in all aspects (Fan, 2017)[3]. Overall, the current focus of English teaching in

colleges and universities is on the language itself. It is okay to face some theories and exams. Relatively speaking, practice is worse, and English for Specific Purposes (ESP) is very strong. The practicality can make up for the shortcomings of current colleges and universities (Jiang, 2013)[4].

1.2 Purpose of research

With the popularity and development of English language, the purpose of learning English has also changed. English learning is no longer a single conversation, but a continuous change to diversity (Zhao, 2012)[5]. A new approach to English learning, ESP (English for Specific Purposes)[6], is then used (Xue, 2015)[7]. In recent years, due to the problems of English language teaching in traditional Chinese universities, there is an urgent need to transform into ESP. The theoretical framework of ESP has a great influence on college English teaching. The purpose of this paper is to analyze the transformation of English language teaching to ESP in colleges and universities, and propose corresponding transformation strategies. Specifically, the investigation of the special-purpose English (ESP) courses in four universities in China was conducted. The specific conditions of the special-purpose English courses offered by colleges and universities were discovered, and the problems existed in them were found. According to the characteristics of English for special purposes, The path of English language teaching to ESP in colleges and universities.

2.THE PROBLEMS EXISTING IN TRADITIONAL COLLEGE ENGLISH LANGUAGE TEACHING

2.1The English language course curriculum is unreasonable

In the process of college English teaching, teachers only pay attention to the English major and the majors related to English, but pay little attention to the learning situation of other professional English courses, and do not realize the importance of English language learning. In general, English in professional courses is as important as basic English teaching, but in the real teaching process, this is far from the case (He, 2013)[8]. According to the development of English courses in colleges and universities, the author investigated the establishment of English courses in four universities in China from five aspects: whether to open courses, the proportion of courses, the number of courses offered, the form of teaching, and the level of teachers. See Table 1 below for details.

According to the survey results in the above table, these four colleges have opened additional English courses, but the degree of emphasis is different. Colleges and universities are most concerned about the opening of

English courses. All majors have English courses, and the number of classes is higher. More, the form of teaching, the teacher's teaching level is relatively high, so the effect will be the best. In contrast, the other three colleges and Table 1. University English Course Opening Questionnaire

school	Whether to offer courses	Course opening ratio	Number of courses offered	Teaching form	Teacher level
A high school	Yes	65%	once a week	Multi-professional joint teaching	ESP special purpose English teacher
B high school	Yes	100%	three times a week	Individually taught in this major	Professional teacher
C high school	Yes	30%	Twice a month	Multi-professional joint teaching	Other teacher
D high school	Yes	50%	Three times a month	Teaching in this major	English Academy teacher

2.2 Students have limitations on the study of English courses

In colleges and universities, students attach great importance to the learning of English courses, but they have great limitations on English learning. Many college students think that mastering basic English is enough. The main purpose of learning English is to graduate, take an entrance examination for postgraduate, apply for an examination for public institutions and so on. When the students get the relevant certificates, they will not continue to study English seriously. They think that English for special purposes is complex, difficult and unnecessary, so whether they learn English for special purposes will not affect their future and future. In addition, it is more difficult to learn professional English than general English, and the learning time is longer. In college, professional English is generally learned after sophomore year, because there are few courses for students at this time, but for students who are not prepared to learn English in depth, it will be a little difficult to learn special English.

Moreover, junior and senior students also have a lot of professional courses, and they have a lot of learning pressure. Most of the students do not know the benefits of learning English for special purposes. They feel that learning English for special purposes is dispensable. It is not positive in thinking. Moreover, the seniors also face the problem of graduation choices. They are continuing to study, taking master's and doctoral degrees, or taking public institutions, going abroad for further study, or starting their own businesses. These are the problems that plague junior and senior students. A lot of time and effort (Xing, 2014)[9-10]. Therefore, the enthusiasm of students to learn English for special purposes will be weakened, which is a big blow to students learning English for special purposes, which leads to the weakening of students' learning efficiency, which affects the teaching effect of the entire class and even the instructors. Over time, it forms a vicious circle.

2.3 Lack of dedicated teaching materials

In the process of English language teaching in colleges and universities, many colleges lack special teaching materials, which greatly affects the quality of teaching.

universities have a lack of emphasis on the establishment of English courses. The number of lectures, lecture places and teachers are not the best resources, so the teaching effect will not be good there. It has had little effect.

Since there is no professional dedicated English teacher to teach, there will be many doubts in student learning, which has a very negative impact on the enthusiasm of students to learn English for special purposes. Moreover, the textbooks for specialized English used by various professions are also very problematic. Many textbooks directly introduce foreign textbooks. Due to differences in Chinese and Western cultures and ideologies foreign-specific English-language textbooks are very incompatible with Chinese college students. Some new majors also do not have their own independent textbooks, many of which are shared. All of the above reasons are greatly hindering the development of English for specialized English in Chinese universities, and also dampen the enthusiasm of students to learn English for special purposes. With the development of society, the future will be further globalized, and the importance of English for specialized use will become more and more prominent. It will become a skill that students must possess, and the lack of special teaching materials needs to be solved urgently.

3. THE CONCEPT AND ADVANTAGES OF ESP

ESP is an English learning method that connects a particular subject or major with basic English knowledge. In the ELT tree, ESP is divided into three branches, namely English for Science and Technology (EST), English for Business and Economics (EBE), and English for Social Study (ESS). In addition to this classification, ESP has other classifications, such as ESP (English for Occupational/Vocational Purposes), English for (English for Academic/ Educational Purposes), and English for Science and Technology.

ESP makes English learning not only a single study, but also needs to be related to the needs of the majors, in-service industries, etc. that you have studied. ESP is also continually absorbing new knowledge to optimize the curriculum framework and improve the content of the course to meet the needs of learners of different levels, different professions and different needs in order to improve the teaching effect. The core of ESP teaching is to take learning as the central idea. When carrying out teaching activities, we will pursue the unity of course content and learner learning needs. Usually, college

English is professional English knowledge after the basic knowledge content of the previous period is completed, but professional English knowledge is difficult to understand and takes a long time to learn (Wu and Jiang, 2013). ESP special purpose English is to use English as a tool or a simple method to learn, so that English learning can be simplified, so as to achieve the stage of completing the English learning plan on time. And ESP has become the mainstream way of learning English in Chinese universities for a long time to come.

4.THE PATH OF ENGLISH LANGUAGE TEACHING TO ESP IN COLLEGES AND UNIVERSITIES

4.1 Raising awareness of the importance of ESP

In order to reform English teaching, colleges and universities must first recognize the importance of English for Specific Purposes (ESP). Specialized English is one of the parts of college English teaching and is also essential. At the same time, in order to better carry out the teaching of English for specialized purposes, the school and the students must work together to make the students clearly understand the importance of learning English for special purposes. The purpose is to enable students to work or study in the future. Can maximize your level of English application. Therefore, the competent education department must raise awareness of the importance of English for special purposes from the source, strengthen management, set up courses efficiently and reasonably, establish a strict supervision system, and timely identify problems and give them in the process of operation. correct. Strengthen publicity so that students have a developmental perspective to look at English for specialized purposes and lay a solid foundation for future development. In the future, the role of English for special purposes will play a great role. With the development of economic globalization, the economies, science and technology, and culture of each country will have a great intersection. English may become a normal language. Specialized English talents will become "Xiangxiang", so special-purpose English will become the top priority of college English reform.

4.2Reasonably formulate ESP course content

Specialized English (ESP) curriculum content development needs to pay attention to the degree of difficulty and practical nature, according to the syllabus, in order to achieve excellent teaching results for the purpose of targeted and targeted development. Compared with the regular basic English, special-purpose English is boring and difficult to understand because it involves many professional vocabulary and sentences. The interest of students is not high. Only the professional and specialized English that students learn can be combined. Can give students the greatest degree of learning enthusiasm. Therefore, the content of the ESP curriculum can be started from the following aspects: First, familiar with professional English in this industry.

Vocabulary knowledge, industry grammar rules, see if the discourse meets the standard of the professional industry, and second, determine the use of professional English, and then collect various documents of the industry, engineering mapping paper, production and maintenance

materials, scientific research design There are various types of documents, letters, standard documents, contract contracts, etc. used in activities such as bidding. Again, compile tasks or projects in representative situations and select similar tasks and cases. Finally, professionals in the field should be hired to participate in industry context, situation analysis, corpus collection, document cataloging and other activities. In this process, listen to the professional opinions of the industry personnel to modify, after the modification is completed, please ask the industry personnel to check and confirm. Although these tasks are complicated, the only way to verify the true level of discourse is to test the truth.

4.3Flexibly training qualified ESP teachers

Due to the late introduction of ESP in China and the lack of perfect implementation methods, the current teaching of English-speaking teachers in colleges and universities is generally lacking. Most of them are taught by English-speaking teachers and rely heavily on other faculty. There are two ways to solve the problem. The first is to convert the teachers of the professional courses into the teachers of the specialized English courses, and the other is to transform the teachers of English majors into teachers of specialized English courses. However, these two methods are not the best, and all have certain deficiencies. How to solve the poor English practice level of professional subject teachers, the shallow knowledge of a certain subject of English teachers has become the most annoying problem in colleges and universities today. The school's educational administration department should introduce a comprehensive mechanism and plan to cultivate a variety of specialized English teachers. The best way to train teachers who specialize in English is to let the teachers go out to study. You can assign English teachers to study at universities with obvious professional advantages at home and abroad, and assign professional teachers with certain English foundations to English majors. Learning, through learning both, can learn the knowledge of their respective professions and make up for solving their own problems. Secondly, under the condition of the shortage of teachers, colleges and universities can also organize training in schools. They can hire famous people or teachers in professional fields to study in the school. Without affecting the normal teaching work, English teachers and professional teachers can be arranged to specialize. Use speech contests for English teaching, find some problems in teaching through competition, solve problems existing by everyone's brainstorming, guide teachers to learn from each other and make progress together. At the same time, colleges and universities should encourage teachers to conduct self-study. Professional curriculum teachers should learn by themselves and, through their own efforts, learn more about English and become a specialized English teacher. It is also possible to arrange for the teachers of the school to go to the professional counterparts to learn, to improve the professional knowledge through the cooperation of the form of teaching, and to strengthen the ability of oral English and translation. I believe that through the diversified training methods, the resume will be established professionally.

Dedicated team of dedicated English teachers.

5.CONCLUSION

It can be seen that the first step in the study of English for specialized purposes is to enable students, teachers and schools to understand the characteristics of ESP and increase the common sense of identity, so as to promote the reform of English teaching in colleges and universities. This paper studies the transformation of college English language teaching to ESP, and finds that English language teaching in colleges can be transformed from ESP to improve the understanding of the importance of ESP, rationally formulate ESP curriculum content, and flexibly train qualified ESP teachers. The university's ESP (Special Purpose English) course requires the cooperation of schools, students and teachers, so that the effectiveness of the English-language courses for special purposes can be maximized, so that students can better apply English in their future work and study. , the best preparation for the upcoming economic globalization.

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The causes of Australian Securities Exchange Market Price Volatility- A Case Study Based on TCL.ASX

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Abstract: Volatility is an essential factor to make an investment decision and manage risk. Firstly, this report analyzes the characteristics of TCL. As one of the critical features of volatility, volatility clustering is next to be introduced. The features of volatility clustering of TCL in 2019 and 2020 are also investigated and compared. Thirdly, the regression models, including multiple variables and AR(2) model, are established to forecast TCL's weekly volatility. Besides, when investing both stock and cash, the volatility targeting strategy and buy-and-hold strategy are two methodologies to allocate assets. To comparing these two strategies, the portfolio return, volatility and Sharpe Ratio are listed based on the weekly volatility forecasted by LINEST.

Keyword: TCL.ASX; eMarket price volatility; Australian Securities

1. COMPANY CHARACTERISTICS

1.1 Company basic characteristics

Table 1. Profitability ratios (source: Datanalysis Premium)

Item	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20
Net Profit Margin (%)	14.86	24.66	12.69	9.95	8.75	14.55	-0.77	-2.79
EBIT Margin (%)	30.67	49.05	37.1	36.74	33.78	31.47	16.61	16.81
EBITA Margin (%)	30.67	76.33	64.68	60.59	54.32	49.48	37.78	45.49
EBITDA Margin (%)	57.69	78.76	66.72	63.17	56.77	51.82	40.49	49.59
ROE (%)	5.05	4.72	4.95	4.37	5.32	8.59	-0.37	-1.28
ROA (%)	4.09	4.1	3.55	3.53	3.67	4.17	1.88	1.71
ROIC (%)	5.34	9.41	6.61	7.12	7.71	8.36	6.98	7.15
NOPLAT Margin (%)	29.47	71.04	53.48	53.38	47.38	47.5	34.91	42.42

Most of the analysts hold neutrality attitudes to TCL. As *Figure 1* shown, the cents per share is negative and decreasing as time going by. The average analyst recommendation for the market and the industry of transportation and infrastructure is to moderate buy or hold. However, for TCL, the average analyst recommendation is to hold this stock.

Figure 2 and *Figure 3* show the weekly stock return and volatility over full sample. From 2015 to 2019, the return of TCL are fluctuated from -5% to 5%. However in 2020, the return of TCL reached its lowest point at -19.35% on the third week of March and the volatility is high in March. This is because COVID-19 severely impact Australian economy and stock market since its outbreak in February. As an Australian-owned road operator company, TCL cannot get rid of the negative impacts of economy hitting.

TCL is an Australian-owned road operator company that manages and develops urban toll road networks in Australia, Canada and the United States. Based on the Global Industry Classification Standard (GICS), TCL belongs to the industry of transportation and infrastructure. According to share market data at 20/10/2020, the total shares quoted is 2735.5m and last close price is \$13.91 and the current market capitalization of TCL is calculated by multiplying the number of common shares and share price, which is \$38,065 million (Datanalysis premium, 2020). During the financial year from June 2019 to June 2020, TCL generated total revenue of \$3616 million including toll revenue of \$2510 million, construction revenue of \$1003 million and other revenue of \$103 million. Profitability ratios from 2013 to 2020 are shown in *Table 1*. From the table we can see, the profitability of TCL decreased with some fluctuation from 2013 to 2019.

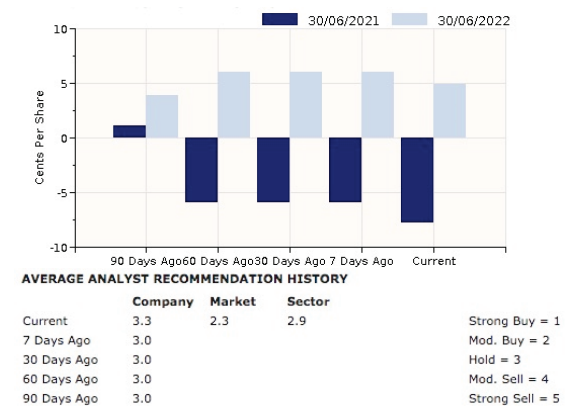


Figure 1. Analyst Forecast(source: Datanalysis Premium)

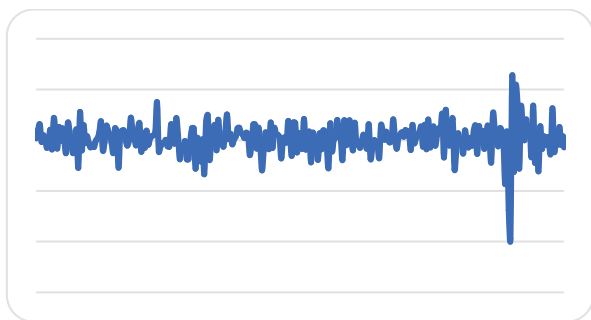


Figure 2. weekly stock return over full sample

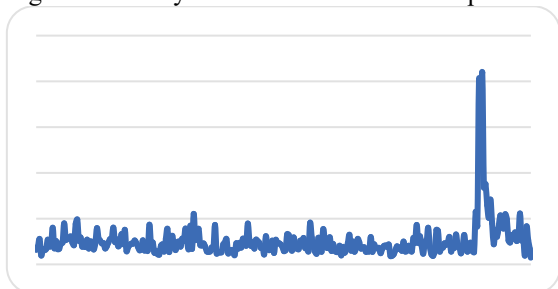


Figure 3. weekly stock volatility over full sample

2. VOLATILITY CLUSTERING

Volatility clustering is one of the volatility characteristics so that the volatility could be predicted by using this statistical property. In this part, I will discuss two methods to measure volatility clustering introduced by Marra(2015) and estimate volatility clustering of TCL in 2019 and 2020.

2.1 Volatility clustering

Volatility clustering was first introduced by Mandelbrot(1963), which means massive changes tend to be followed by large changes, and small changes tend to be followed by small changes is not constant over time. This is mainly caused by investors' inertia when investors receive new information; they are reluctant to trade in the market and change their views or holdings. Therefore, the market value does not change immediately, and the adjustment of volatility slows down. Marra(2015) measures volatility clustering in two ways. Firstly, Marra uses autocorrelation model to show the serial correlation in the absolute value of global equity returns; eventually, the positive serial correlation decays in a series of the period. Secondly, there's a linear relationship and serial correlation of volatility, which could be shown by a scatter chart of the current month versus next month's volatility.

2.2 Estimating volatility clustering of TCL in 2019 and 2020

As Marra(2015) suggested, the first way to measure the volatility clustering is autoregression model. After calculating the absolute value of returns, the autocorrelation between the absolute value of returns and its lagged value can be drawn as Figure 4. The result shows that the absolute value of returns decays over 2019 and 2020. The volatility clustering is higher in 2020 than 2019.

Compared the volatility clustering in 2019 and 2020, the volatility clustering is higher in 2020 by using these two models. The economy is less stable in 2020 than that in 2019. In 2020, COVID-19 severely impact the Australian economy and stock market. The uncertainty of the stock

market triggered more investors to sell TCL in the stock market as these risk-averse investors hold a negative view on TCL. After that, the stock price fluctuated much more severely, which caused a high volatility clustering situation in 2020.

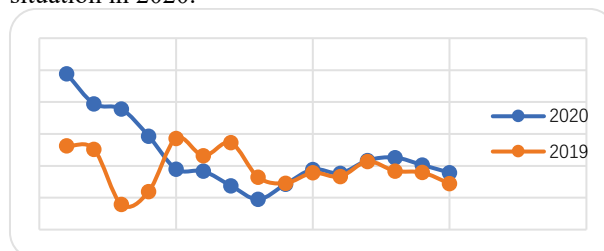


Figure 4. autocorrelation of absolute value of returns in 2019 and 2020

Another way to estimate volatility clustering is using regression model. Using data analysis in Excel, the regression model of current volatility and following volatility could be generated as Figure 5 shown. For the volatility regression model of 2020, the R square(0.38) and coefficients(0.63) are higher than that of 2019 with R square of 0.053 and coefficients of 0.23. From the figure we can see, the volatility clustering in 2020 is higher than 2019.

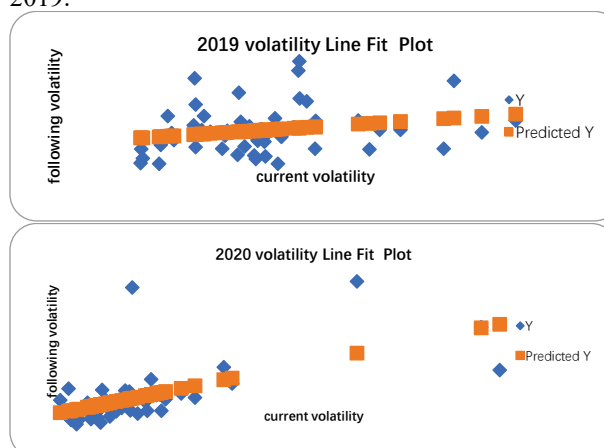


Figure 5. regression of current volatility and following volatility in 2019 and 2020

3. REGRESSION MODEL TO FORECAST WEEKLY VOLATILITY

3.1 Explanatory variables to forecast volatility

The regression model could be used to forecast the volatility by using different explanatory variables. Based on the market situation and the operation of TCL, 5 independent factors are introduced to determine the forecasted volatility - the lagged volatility, the lagged return, the trading volume, the volatility of bond market and the volatility of AUD/USD exchange rate.

3.1.1 The lagged volatility

Marra(2015) estimated the volatility clustering by autocorrelation model, which means that the past volatility may be indicative of future volatility. The increases in volatility tend to create less demand for this stock, thereby increasing the degree of negative feedback trading and the willing of selling this stock by more investors, which induce a higher volatility in the following period.

3.1.2 lagged return

Return is expected to be a useful predictor for TCL stock volatility. The hypothesized leverage effect illustrates a negative relationship between volatility and returns (Black F., 1976). If the returns are negative, it may cause larger changes in volatility. The volatility feedback effect also suggests that investors require a higher risk-adjusted return so the declining stock prices will lead to a volatility change (Marra, 2015). So I supposed that the lagged return may be one of the factors that impact TCL's volatility.

3.1.3 Trading volume

Mixture of Distribution Hypothesis (MDH) posits that the distribution of trading volume is subordinated to the distribution of initial price changes on individual changes (Clark, 1973). An explicit estimation of this hypothesis is that volatility in price changes influences economic decisions of market investors, the trading volume provides signal to the permanence of any shocks to price change process. TCL is a large construction company with a high stock trading volume in the stock market, so its trading volume is useful to predict the following volatility.

3.1.4 volatility of SDPR S&P/ASX Australian Bond

According to Marra (2015), large volatility in one market are usually combined with another market's price movement. SPDR S&P/ASX Australian Bond Fund (BON) is an exchanged traded fund investing in Australian fixed rate bonds. Bond market is relative in a stable return and low risk compared to stock market. If TCL performed a large movement in stock market, investors may seek other financial markets to change their investment decisions. When lots of investors move to the bond market and cause a large volatility in bond market, the TCL's volatility may be affected.

3.1.5 Volatility of AUD/USD

TCL is an multinational company operating in both Australia and the United States. According to Yucel and Kurt (2003), the internationalization of capital markets resulted in cash flow between countries and listing equities, so the volatility of exchange rate would impact the stock market volatility.

Based on the five explanatory variables, the regression model formula can be concluded as following:

$$\text{Volatility}_t = \beta_0 + \beta_1 \text{Volatility}_{t-1} + \beta_2 \text{Return}_{t-1} + \beta_3 \text{Trading Volume}_{t-1} + \beta_4 \text{Volatility of a broad market index}_{t-1} + \beta_5 \text{Volatility of AUD/USD}_{t-1}$$

The most critical factor in explaining the stock's weekly volatility is likely to be trading volume. When investors acquire the information of a large amount of trading volume, they may think this stock is expected to increase or decrease dramatically so they would decide to buy or sell this stock. So the volatility of returns is much higher when the trading volume is high. TCL is an Australian-owned road operator company and the stock trades in a large amount in the stock market. When the trading volume is high, it is likely to trigger investors to change their investment decisions to follow the market changes.

3.2 Regression results of TCL weekly volatility from 5 Jan 2015 to 29 Jun 2020

The estimation period from 5 Jan 2015 to 29 Jun 2020 is

used to develop a forecasted volatility regression model and the regression results of estimated coefficients and t statistics by using five explanatory factors introduced previously are shown as Table 2. The t statistic can be used as a measure of the precision with which the regression coefficient is measured. From Table 2, the volatility of AUD/USD has the largest t statistic value so it has the most significant explanatory power on the forecasted volatility. TCL operates its business of huge infrastructure construction in both Australia and the United States, and the operating income is in a large amount. Therefore, the exchange rate of AUD/USD impacts TCL's profits significantly.

Table 2. Regression Results

	Estimation Period 5 Jan 2015 to 29 Jun 2020	
	Coefficient	T stat
X1-Volatility in last week	0.2534	4.2260
X2-Lagged Return	-0.0596	-2.2678
X3-Trading Volume	0.2185	0.8014
X4- volatility of bond index	1.4757	4.2417
X5- Volatility of AUD/USD	1.1311	8.6599
Constant	-3.8526	-0.8395
Adj R2	0.5849	
DW	2.2072	

3.3 AR(2) of TCL weekly volatility from 5 Jan 2015 to 29 Jun 2020

Autoregressive model is a method to deal with time series. According to Marra (2005), the

Table 3. AR(2) Results

	Estimation Period 5 Jan 2015 to 29 Jun 2020	
	Coefficient	T stat
σ_t-1	0.4076	7.3195
σ_t-2	0.3630	6.5153
Constant	0.5937	4.0202
Adj R2	0.4785	
DW	1.8152	

The adjust R square measures the explanatory strength of independent factors to the forecasting factor. So a larger adjust R square of regression model is better than the AR(2) model. The smaller MSE, the better the forecasting performance of the model. The MSE of the first regression model is 1.6536 while the MSE of AR(2) model is 2.1063. It indicates that weekly volatility may be affected by several factors and five explanatory factors are much better than only two factors to forecast the weekly volatility.

4. VOLATILITY FORECASTING AND VOLATILITY TARGETING

4.1 LINEST function

Volatility targeting is an asset allocation methodology that is directly impacted by volatility forecasting. To build a volatility targeting strategy of 12 weeks from 29 June 2020 to 21 Sep 2020, the rolling forecasts for weekly volatility is conducted by LINEST (Table 4).

4.2 volatility targeting strategy VS buy-and-hold strategy
Assets allocation could be used to control the overall portfolio returns remaining the weekly volatility at 1.39%. Assuming there is no transaction cost, for a portfolio of cash and TCL stock, the risk of cash is zero so only TCL determines the volatility of the portfolio. The investment

weight for TCL could be calculated by dividing weekly target volatility by TCL forecasted volatility. After one period, the real weekly volatility of the portfolio is 1.611%, Table 4. Regression Results using full sample

	b5 AUD/USD	b4 volatility of bond index	b3 ln(volume)	b2 lagged return	b1 lagged volatility	b0 intercept	forecast
29/6/20	1.131	1.476	0.218	-0.060	0.253	-3.853	
6/7/20	1.110	1.494	0.210	-0.060	0.261	-3.702	2.8137
13/7/20	1.113	1.502	0.214	-0.059	0.259	-3.762	3.1529
20/7/20	1.111	1.506	0.210	-0.059	0.259	-3.700	2.8991
27/7/20	1.109	1.491	0.204	-0.060	0.261	-3.597	2.7300
3/8/20	1.109	1.489	0.205	-0.060	0.261	-3.602	2.1339
10/8/20	1.097	1.487	0.192	-0.062	0.265	-3.378	2.6040
17/8/20	1.096	1.484	0.194	-0.062	0.265	-3.400	1.9169
24/8/20	1.095	1.485	0.193	-0.062	0.266	-3.387	2.3661
31/8/20	1.098	1.460	0.199	-0.064	0.267	-3.485	3.0501
7/9/20	1.099	1.462	0.199	-0.065	0.266	-3.484	2.9909
14/9/20	1.094	1.455	0.200	-0.066	0.267	-3.497	2.8642
21/9/20	1.048	1.475	0.112	-0.068	0.281	-1.983	1.9441

A buy-and-hold strategy means an investor holding a portfolio and not changing the asset allocation for a long time in holding period, which is a passive investment strategy. The Sharpe ratio reflects the risk-adjusted return. Dramatically, COVID-19 impacted the economy badly and the stock return for TCL is negative for several weeks,

Table 5. Volatility Targeting Strategy VS Buy-and-Hold Strategy

	Average return	Average volatility	Modified Sharpe ratio
Volatility targeting strategy	-0.2739	1.6110	-0.4412
Buy-and-hold strategy	-0.3817	3.0649	-1.1700

Assuming transaction cost exists,

Modified Sharpe ratio of volatility targeting strategy = The weekly average return after transaction cost*average weekly risk

When modified Sharpe ratio of volatility targeting is same as that of buy-and-hold strategy,

$-1.17 = (-0.2739 - c) * 1.611$, so transaction cost is 0.4523.

When the annualized modified Sharpe ratio of volatility targeting strategy is greater than one, the implied weekly Sharpe ratio is greater than 0.139.

$0.139 = (-0.2739 - c) * 1.611$, so transaction cost is - 0.36, which is impossible in real world.

Therefore, assuming that the average returns and volatility remain the same, when the modified Sharpe ratio increases, the transaction cost should be lower. A larger

Table 6. Alternative Volatility Targeting Strategy

Annual volatility	Weekly volatility	Average return	Average volatility	Sharpe ratio
5%	0.69	-0.1369	0.8055	-0.1700
10%	1.39	-0.2739	1.6110	-0.1700
15%	2.08	-0.4108	2.4165	-0.1700
20%	2.77	-0.5478	3.222	-0.1700

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which is a little bit higher but close to the targeting volatility of 1.39% (Table 5).

so both strategies bring a loss for an investor. The Sharpe ratio is negative in a bear market when average return is negative, so it is no longer useful. The modified Sharpe ratio could be used to compare investment performances. The volatility targeting strategy have a higher risk-adjusted than the buy-and-hold strategy.

modified Sharpe ratio means a better investment performance for a portfolio to adjust its risk. A higher cost will decrease this kind of adjusted return.

4.3 Alternative volatility targeting strategy

As shown in Table 6, although a negative Sharpe ratio caused by a bear market is not useful, from the different volatility targeting strategy, there is still a pattern that Sharpe ratio remains same no matter how target volatility changes. Firstly, when average volatility is increasing, the Sharpe ratio remains constant. Because the average return is increasing as the average volatility increasing. Secondly, the weight of TCL investment would increase when average volatility increases. Because there is no risk with cash and only the weight of stock would determine the portfolio volatility.

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A Study on Racism in *The Banker*

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Abstract: This paper focuses on *The Banker*, the latest American film produced in March 2020, to study the historical problem, racism, in the United States and the efforts made by the protagonist to solve the deep-rooted racial discrimination in the south of the United States. The film is based on the true story of Bernard Garrett and Joe Morris, two African American bankers. In the 1950s, they tried to break away from the traditional shackles of racial discrimination despite the difficulties. In the end, the two men three years in prison caused the attention on the problems left over by the racial discrimination in the south of the United States, and the situation had been improved then, which reflects the realization of the American dream and is worth studying.

Keywords: *The Banker*; Racism; Racial Discrimination; Racial Segregation; American Dream

1. INTRODUCTION

Film is an important expression of the development of the times and the historical process, and an important part of the complex changing cultural system. Therefore, some scholars point out that "film is the visual evidence left by history"[1]. The United States is a multi-cultural immigrant country, and the ethnic groups of various colors and races construct the ecological system of the whole country. People of different colors play different historical roles in the national construction and historical development of the United States. However, with the passing of time, racial discrimination has not been completely eradicated. Today, it still affects the life style of American citizens[2]. *The banker*, the latest film produced by the United States in March 2020, reflects the historical problem of racism in the United States and the efforts made by the protagonist to solve the deep-rooted racial discrimination in the south of the United States. The film is based on the true story of Bernard Garrett and Joe Morris, two African American bankers. In the 1950s, they tried to break away from the traditional shackles of racial discrimination. In the end, the two men three years in prison caused the attention on the problems left over by the history of racial discrimination in the south of the United States, which reflects the realization of the American dream and is worth studying.

2. DEEP ROOTED RACIAL DISCRIMINATION IN THE UNITED STATES

The United States is a multi-ethnic country. In the history of European colonial expansion and African slave trade, as well as the continuous influx of a large number of immigrants in modern times, the American ethnic structure and ethnic relations have been formed. Race is an important social category in the United States. American scholar Thomas Sowell pointed out in *A Brief History of American Race* that, "Skin color obviously

plays an important role in determining the fate of Americans." Based on this distinction, a hierarchical system of group status and group power has gradually formed among different races in the United States. The fundamental control of the state power and systematic discrimination against all other ethnic groups are the core features of American racial hierarchy. Racial discrimination in the United States is, in fact, white Europeans' discrimination against all other minorities. Racial discrimination is not only the cause of the formation of this racial hierarchy system, but also the maintenance mechanism of this racial hierarchy system[3].

3. THE MANIFESTATIONS OF RACIAL DISCRIMINATION IN *THE BANKER*

Racial discrimination in the banker is mainly manifested in the strict apartheid system. Residential segregation refers to that two or more groups live in different parts of the city and live apart from each other. However, residential segregation in the United States is mainly generated between the main white race and ethnic minorities[4]. In the film, Bernard Garrett is a black man born in Willis Town, Texas, USA. Due to the poverty of his family, he made a living as a shoeshine boy when he was young. Because of his dream of becoming a banker, he shine shoes outside the Mainland Bank in the white district every day and secretly learns to do business from those white bankers. When his father saw his notes, he was surprised by his son's arithmetic talent and exclaimed, "Negro can't earn money with this. White man won't let him, no matter how good at it you are." However, Bernard didn't give up pursuing his dream. Instead, he insisted on learning financial knowledge and saving money, and finally won the first pot of gold in Houston. Later, he took his wife and his son to Los Angeles for development. With the help of his own wit and efforts, as well as the help of black co-investor Joe Morris and white Matt Steiner, he broke the apartheid system of Los Angeles step by step, and became the owner of the highest bank building and hundreds of real estate in Los Angeles from a poor black man who could not enter the bank, and helped thousands of black people move from black areas to white areas with improved living environment and living conditions, which blurred the boundaries between black and white area, and broke the residential segregation system in the United States. He even has a photo standing beside Vice President Johnson in the bank building. He and Joe were quite popular in Los Angeles for a time.

Bernard, who succeeded in Los Angeles, in order to further realize his American dream, to help more black people improve their living environment, obtain bank loans and own investment capital, he insisted on buying the Mainland Bank in his hometown despite the strong opposition of Joe. Joe had no choice but to compromise

and bought the Mainland Bank together with Bernard. However, due to Texas' strict racial system, they can only employ white Matt to be the boss. Black people are not allowed to enter the bank in Texas unless they wear the clothes of servants. So, in the movie, Joe accompanies Matt to the bank to sign a contract as a driver. Bernard, waiting outside the bank, has no choice but to put on the driver's hat also to avoid revealing his identity.

After the successful acquisition of Mainland Bank, Bernard helped the 9 local black people to make a successful loan within a week, which made the Robert Florence Jr., son of Mainland Bank's former boss, suspicious and secretly investigated Matt, he soon found out black loans that Matt had lent to the niggers, and exposed it to the US Treasury Department. In order to transfer the black loans in the Mainland Bank before the US Treasury Department investigated, Bernard and Joe reluctantly agreed to Matt's proposal to buy another bank and allow him to be the boss. As a result, Matt, who was not fully prepared, made troubles shortly after running Marlin bank. He did not listen to Bernard's suggestion but hired a lawyer introduced by Robert Florence Jr. and bought a lot of bad mortgages which had been switched by Robert Florence Jr. in advance.

Bernard was so incredible that he decided to sell Marlin bank, but before he sold it, Matt had already sold the bad mortgages of Marlin to the Mainland Bank at face value. As a result, both banks were closed and Bernard and Joe were arrested. In court, Matt, in order to protect himself, followed the advice of his lawyer, and once again betrayed Bernard and Joe, claiming that he had been instructed by them to do all these. Bernard could have taken the immunity deal and regained his freedom if he confirm what Matt had told in court, but he followed his heart and chose to tell the truth in court. He exposed deep-rooted racial discrimination in the United States in public, "All men are created equal" declared by the United States' founding documents is nothing but a lie. As black Americans, they have to abide by the dress code, and they have no right to get a loan, so they can't own their houses or start a business. They are mercilessly excluded from the American dream.

Bernard and Joe were eventually sentenced to three years' imprisonment. 177 properties under the names of the two were confiscated, and only one property under the name of Eunice was retained. Robert Florence, Jr., bought the Mainland Bank under the arrangement of the Federal Deposit Insurance Corporation. The purchase price was much lower than the price Bernard and Joe bought from Florence's father before. The film vividly shows the deep-rooted racial discrimination in American Society, especially in the south American, exposes the political structure and ideology of American white supremacy, and highlights the extreme hypocrisy of "American human rights". Equality before the law is the basic principle of the international human rights charter. Although the political concept and legal system of the United States also explicitly recognize this principle, in reality, the law enforcement and judicial practice in the United States runs counter to it. Racial discrimination in related fields is

becoming more and more serious, and the basic human rights of African Americans are wantonly trampled on[3]. The good news is, Bernard and Joe began to rebuild their fortunes in the Bahamas, before moving back to the United States. The hundreds of residential buildings they purchased in "white only" areas made them instrumental in the fight against housing segregation in Los Angeles. Three years after their testimony before the Senate Congress passed the *Fair Housing Act of 1968*, which made it illegal to refuse to sell or rent property on the basis of race, religion or gender. To a certain extent, it protect black people's housing rights and interests from the legal system and is an important measure for African Americans to get rid of the shackles of residential segregation system and realize national equality and social equity, which is conducive to the realization of African American dream.

4. THE CURRENT SITUATION AND INFLUENCING FACTORS OF RACISM IN THE UNITED STATES

Compared with the naked racial discrimination and racial segregation in history, the manifestations of racial problems in modern American society are more obscure. For example, on the issue of residential segregation, even though some government policies are not based on racial discrimination, the effect is to make residential segregation more serious. However, the use of urban renewal and other means to raise housing prices, making black people forced to leave the community, is considered to be a seemingly "gentle" ethnic cleansing[5]. American scholar Rothstein believes that the factors that promote residential apartheid include personal discrimination, white fleeing, greed of real estate developers and financial institutions, as well as the influence of racial gap between the rich and the poor and self segregation. However, without the government's intention, these factors will not be realized. He called the racial segregation caused by private behavior "de facto", and the racial segregation caused by state behavior as "de jure". The latter kind of segregation is against the constitution of the United States and the *Civil Rights Act*[6]. At present, the "low income housing tax deduction policy", housing coupons and "exclusionary zoning" are the main means for the government to promote "legal segregation". Even though the starting point of some policies is not based on racial discrimination, the effect is to strengthen the racial segregation in residential areas[4].

5. CONCLUSION

After the civil rights movement, the political status, social and economic conditions, living environment and other aspects of American minorities have been greatly improved. Naked racial discrimination is no longer common, but racial discrimination is still a chronic disease of American society and has a profound impact on the lives of ethnic minorities[4]. *The banker*, under the background of the American civil rights movement in the 1950s, reflects the problems left over from the history of racism in the United States and the efforts made by the protagonist as a black representative to solve the deep-rooted racial discrimination in the south of the United States. Three years after the heroes were released from

prison, the Congress passed the *Fair Housing Act of 1968*. The act, to a certain extent, protected the black people's housing rights and interests, improved the status of residential segregation in the United States, and embodied the realization of the American dream. However, we should be aware that the phenomenon of apartheid in the United States has not disappeared, and it still exists today. There is still a long way to go before the issue of apartheid in the United States can be completely solved.

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Analysis and Forecast of Influencing Factors of Anhui Tourism Foreign Exchange Income Based on Grey Correlation Method

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Abstract: In order to analyze the influencing factors of foreign exchange income of tourism in Anhui Province and predict its future development trend, this paper collects statistical data of economic factors related to foreign exchange income of tourism in Anhui Province from 2005 to 2018, and uses software Matlab and Eviews to solve and forecast. Firstly, the main influencing factors of foreign exchange income of tourism in Anhui Province were determined by grey correlation analysis. Then, the common least square method is used for parameter estimation, and the regression prediction model is established after test analysis. Finally, the prediction accuracy of the model is tested to verify its accuracy in predicting the foreign exchange income of Anhui tourism in the short and medium term and provide reference for the development planning of inbound tourism in Anhui Province.

Keywords: Tourism foreign exchange income; Grey correlation; Multiple regression; Short to medium term forecast

1. INTRODUCTION

In recent years, the Anhui Province tourist foreign exchange income rising for years, but its regional linkage development, infrastructure construction, services, personnel training, tourist city propaganda, and there exist certain deficiencies, development pattern innovation and the influence of the present international emergency outbreak, inbound tourism industry in Anhui Province is facing the grim situation.

In the study on factors influencing the development of the tourism industry, Chenming Zhang^[1](2020) explored several factors influencing the development of China's inbound and outbound tourism, including economic level, tourism demand, policies and measures, infrastructure, etc. Using the empirical background of Spain, Anyu Liu^[2] (2019) mainly studied the spillover effects of externalities of tangible capital, human capital and public services on tourism and other sectors. In addition, the idea of exploring the main influencing factors of tourism foreign exchange income in a particular region through gray analysis is also reflected in many references^[3,4]. Wan Lexing^[5] (2016) mainly uses gravity model to analyze Jiangxi Province's tourism resource endowment, transportation facilities and regional economic development level.

In the study on the development proposals for the tourism industry, Barnard Turner^[6] (2007) mainly studies the sustainable and coordinated development of the inbound tourism industry in Lithuania, a European country. Issahaku Adam^[7] (2019) explores the impact of digital leisure on the experience of inbound tourists and puts forward relevant Suggestions. Zhu Jiaming et al^[8] (2019) based on economic development, infrastructure, talent training and other aspects of Huangshan City Scenic areas put forward proposals for development planning. Liu Wenping et al^[9] (2020) mainly deeply analyzed the development status of the scenic spot's night tourism economy and proposed measures. Yan Li^[10] (2015), focusing on the current situation and problems of China's inbound tourism development, made innovative suggestions on tourism resources, digital tourism, tourism environment and other aspects.

Based on this, this paper selects the index of foreign exchange income of tourism from 2005 to 2018 to reflect the inbound tourism market, carries out influencing factors and forecasts of foreign exchange income of tourism in Anhui Province, and finally puts forward practical suggestions to promote the development of inbound tourism market in Anhui Province in the later stage according to the above results.

2. THE INDEX OF INFLUENCING FACTORS WAS SELECTED BY GREY CORRELATION ANALYSIS

This article is based on the principle of index selection and the actual research selected inbound tourist foreign exchange income in Anhui Province x_0 (Millions of dollars) as the reference sequence, overnight visitors entry x_1 (Ten thousand person-times), the areas in Anhui Province GDP x_2 (One hundred million yuan), the total import and export x_3 (Ten thousand dollars), the third industry employment population x_4 (Per ten thousand person), the consumer price index x_5 (%), the number of star hotels x_6 (Per), Anhui Province highway mileage x_7 (Km), Anhui Province railway mileage x_8 (Km), Anhui international routes mileage x_9 (Km) as the comparative sequence. The original data of each series were sorted out through Anhui Statistical Yearbook and EPS database.

The initial value processing of the original data was carried out, and the correlation degree and ranking of each influencing factor were calculated by Matlab software, as shown in Table 1.

Table 1: Correlation and ranking of the factors affecting Anhui tourism foreign exchange income from 2005 to 2018.

Influencing factor	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9
Correlation degree	0.73	0.71	0.74	0.65	0.64	0.64	0.68	0.65	0.64
Rank	2	3	1	5	6	6	4	5	6

In this paper, the influencing factors with the correlation degree were greater than or equal to 0.65, selected as the main influencing factors and others were secondary influencing factors. That is, the total import and export amount, the number of inbound overnight tourists, the GDP of Anhui Province, the highway mileage of Anhui Province, the number of employed people in the tertiary industry, and the railway mileage of Anhui Province are selected as the main influencing factors.

3. EMPIRICAL ANALYSIS OF MULTIPLE LINEAR REGRESSION

3.1 Selection of indexes of influencing factors. The main factors that influence the selection based on results of calculating the grey relational grade into the multivariate regression model analysis, the selection of tourist foreign exchange income in Anhui Province is (Millions of dollars) as the explained variable Y , inbound tourism overseas visitors X_1 (Ten thousand person-times), the areas in Anhui Province GDP X_2 (One hundred million yuan), the total import and export of X_3 (Ten thousand dollars), the third industry employment population X_4 (Per ten thousand person), Anhui Province highway mileage X_5 (Km), Anhui Province railway mileage X_6 (Km) as the explained variable Y .

3.2 Model setting. Since the foreign exchange income of Tourism in Anhui Province varies significantly with various influencing factors, and most of the influencing factors are consistent with the direction of foreign exchange income of tourism, the model is set as follows:

Table 2: Stepwise regression results.

Model	$\ln X_1$	$\ln X_2$	$\ln X_3$	$\ln X_4$	$\ln X_5$	$\ln X_6$	R^2
$Y = f(\ln X_2)$	-	1.6939 (51.5865)	-	-	-	-	0.9955
$Y = f(\ln X_2, \ln X_3)$	-	1.5758 (9.0367)	0.1103 (0.6899)	-	-	-	0.9957
$Y = f(\ln X_2, \ln X_4)$	-	1.4724 (7.3512)	-	0.8217 (1.1205)	-	-	0.9960
$Y = f(\ln X_2, \ln X_5)$	-	1.6862 (28.6175)	-	-	0.0209 (0.1607)	-	0.9955
$Y = f(\ln X_2, \ln X_6)$	-	1.5310 (0.1346)	-	-	-	0.4245 (1.2462)	0.9961
$Y = f(\ln X_2, \ln X_1)$	0.2696 (2.0905)	1.4518 (12.1622)	-	-	-	-	0.9968
$Y = f(\ln X_2, \ln X_1, \ln X_3)$	0.2639 (1.8479)	1.4365 (8.2086)	0.0192 (0.1254)	-	-	-	0.9968
$Y = f(\ln X_2, \ln X_1, \ln X_4)$	0.2444 (1.6611)	1.3905 (7.2274)	-	0.3114 (0.4169)	-	-	0.9968
$Y = f(\ln X_2, \ln X_1, \ln X_5)$	0.2945 (2.0790)	1.4529 (11.7611)	-	-	0.0633 (-0.5236)	-	0.9969
$Y = f(\ln X_2, \ln X_1, \ln X_6)$	0.3465 (3.1234)	1.1312 (6.9529)	-	-	-	0.6558 (2.4768)	0.9980

$$Y_i = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6 + \mu_i.$$

3.3 Estimated parameters. The software Eviews9.0 was used for regression analysis of the model, and the results were shown in Figure 1.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-12.16775	3.681787	-3.304850	0.0130
LN1	0.331219	0.145428	2.277545	0.0568
LN2	1.007185	0.262501	3.836876	0.0064
LN3	0.072469	0.140406	0.516140	0.6217
LN4	0.359829	0.737619	0.487825	0.6406
LN5	-0.093032	0.120833	-0.769921	0.4665
LN6	0.649173	0.304542	2.131637	0.0705
R-squared	0.998205	Mean dependent var	6.890458	
Adjusted R-squared	0.996666	S.D. dependent var	0.964546	
S.E. of regression	0.055691	Akaike info criterion	-2.631158	
Sum squared resid	0.021710	Schwarz criterion	-2.311629	
Log likelihood	25.41810	Hannan-Quinn criter.	-2.660736	
F-statistic	648.7746	Durbin-Watson stat	2.473101	
Prob(F-statistic)	0.000000			

Figure 1: Analysis of linear regression results of the model. The result analysis shows that the model estimation results are as follows:

$$Y_i = -12.1678 + 0.3312 \ln X_1 + 1.0072 \ln X_2 + 0.0725 \ln X_3 + 0.3598 \ln X_4 - 0.0930 \ln X_5 + 0.6492 \ln X_6$$

In addition, the t statistics of $\ln X_3 \setminus \ln X_4 \setminus \ln X_5$ are small and the coefficient of $\ln X_5$ is opposite to the expected value, so both the economic significance test and the statistical significance test fail.

3.4 Econometric testing

3.4.1 Multicollinearity check. The correlation coefficient matrix of $X_1 \setminus X_2 \setminus X_3 \setminus X_4 \setminus X_5 \setminus X_6$ was calculated, and the model was tested by multicollinearity. The univariable linear regression of $\ln X_1 \setminus \ln X_2 \setminus \ln X_3 \setminus \ln X_4 \setminus \ln X_5 \setminus \ln X_6$ by $\ln Y$ was performed respectively. The regression was arranged in order of the size of R^2 , and the stepwise regression was carried out based on $\ln X_2$. The results are detailed in Table 2.

Since only $\ln X_1 \setminus \ln X_2 \setminus \ln X_6$ in $Y = f(\ln X_1 \setminus \ln X_2 \setminus \ln X_3 \setminus \ln X_4 \setminus \ln X_5 \setminus \ln X_6)$ are significantly correlated with $\ln Y$, the multivariate regression model established is as follows:

$$\ln \hat{Y} = -10.88560 + 0.346454 \ln X_1 + 1.131213 \ln X_2 + 0.655782 \ln X_6.$$

3.4.2 Test of economic significance. It can be seen from the model that the coefficient of $\ln X_1$ is 0.346454, the coefficient of $\ln X_2$ is 1.131213, and the coefficient of $\ln X_6$ is 0.655782. The symbols are all positive, and the value range is consistent with the prior expectation, and the economic test is passed.

3.4.3 Statistical test. $R^2 = 0.998009$, $F = 1670.71$, given significance level of $\alpha = 0.05$, critical value is 3.98. Therefore, the model test results are significant, $t_{0.025}(10) = 2.228$, the test is passed.

3.4.4 Heteroscedasticity test. The model was tested by White test to determine its heteroskedasticity, and the test results were shown in Table 3. When $\alpha = 0.05$, $n = 14$, $k = 3$, the critical value, so there is no heteroscedasticity in this model $\chi^2_{0.05}(3) = 7.8147 > nR^2 = 5.6650$.

Table 3: White test results.

F-statistic	0.4249	Prob. F(8,5)	0.8650
Obs*R-squared	5.6650	Prob. Chi-Square(8)	0.6847

3.4.5 Autocorrelation test. Given the significant level of $\alpha = 0.05$, $n = 14$, $k = 3$, $d_L = 0.767$, $d_U = 1.779$, $d_U < DW < 4 - d_U$, and test the partial correlation coefficient of the model. The results are shown in Figure 2. The straight blocks of the partial correlation coefficient do not exceed the dotted line, so the model has no autocorrelation.

Table 4: Actual value, predicted value and error analysis of inbound tourism foreign exchange income.

Year	Real value(lnY)	Simulation value	Absolute error	Relative error	Mean of relative error
2005	5.2235	5.2039	0.0195	0.37%	0.52%
2006	5.4238	5.4498	0.0260	0.48%	
2007	5.8406	5.7800	0.0607	1.04%	
2008	6.1191	6.1790	0.0599	0.98%	
2009	6.3383	6.3447	0.0064	0.10%	
2010	6.5638	6.6407	0.0769	1.17%	
2011	7.0726	7.0307	0.0419	0.59%	
2012	7.3542	7.3398	0.0144	0.20%	
2013	7.4148	7.4006	0.0142	0.19%	
2014	7.5177	7.4851	0.0325	0.43%	
2015	7.7244	7.6734	0.0510	0.66%	
2016	7.8408	7.8280	0.0128	0.16%	
2017	7.9658	7.9849	0.0191	0.24%	
2018	8.0670	8.1257	0.0587	0.73%	

The prediction results show that the relative error between the predicted value and the true value in each year is less than 0.02, and between 0.001 and 0.02. The prediction results are relatively true, and the model is highly reliable, which can be used to predict the foreign exchange income of tourism in Anhui Province in the short and medium term.

3.5 Establishment of model and analysis of research results

After the above tests, the model of influencing factors of foreign exchange income of Tourism in Anhui Province is finally determined as follows:

$$\ln \hat{Y} = -10.88560 + 0.346454 \ln X_1 + 1.131213 \ln X_2 + 0.655782 \ln X_6.$$

The model shows that when other variables remain unchanged, if the number of overseas tourists increases by 1%, the foreign exchange income of Anhui Province will increase by 0.34645% on average. If the GDP of Anhui Province increases by 1%, the tourism foreign exchange income of Anhui Province increases by 1.131213% on average. For every 1% increase in railway mileage within Anhui Province, the foreign exchange income of tourism in Anhui Province increases by 0.655782% on average.

Sample: 2005 2018
Included observations: 14

Autocorrelation	Partial Correlation	AC	PAC	Q-Sta...	Prob
1	-0.15...	-0.15...	0.3856	0.535	
2	0.252	0.235	1.5697	0.456	
3	-0.44...	-0.41...	5.5897	0.133	
4	0.046	-0.09...	5.6363	0.228	
5	-0.30...	-0.15...	7.9075	0.161	
6	-0.15...	-0.46...	8.5343	0.202	
7	-0.09...	-0.17...	8.8110	0.267	
8	0.265	0.196	11.442	0.178	
9	0.067	-0.25...	11.642	0.234	
1...	0.125	-0.17...	12.522	0.252	
1...	-0.11...	-0.06...	13.540	0.259	
1...	0.048	-0.30...	13.797	0.314	

Figure 2: Partial correlation coefficient test results.

It can be seen that the influencing factors of foreign exchange income of Anhui Province mainly include overseas inbound tourists, gross domestic product of Anhui Province and domestic railway mileage. Then, the final income model is used to predict the average value of foreign exchange income of Anhui Province from 2005 to 2018. The predicted results are shown in Table 4.

present, Anhui Province in the national GDP ranking is not high, the level of economic development is relatively low. In the process of the future development, Anhui Province should deepen the degree of opening to the outside world, establish a good trade partnership, with more countries to attract foreign investment in the tourism industry, thus to Anhui tourism infrastructure construction, transport network building, high-end professional talent to provide the necessary financial support, boost the healthy development of the late.

4.2 Improve infrastructure construction and build a convenient transportation network. Star-rated hotel quantity measure is a region tourism development can hold the number of passengers in the future development of Anhui Province should integrate resources, on the structure can be according to the age, professional structure reasonable choice in the number of star hotels, using big data analysis on layout passenger resident place, in the transport hub and attractions around the efficient choice hotel set up in the region. The construction of transportation facilities is equivalent to the end of the scope of a regional tourism development network. In the future development, Anhui Province should continue to improve the construction of waterway, highway and aviation infrastructure, expand the coverage of the tourism network of Anhui Province, and improve the satisfaction of travelers.

4.3 Enhance the publicity and create the name card of the big Province of international tourism. In the later stage of development, Anhui Province can rely on the influence of Huangshan as a scenic spot to cooperate with well-known media and social tourism platforms at home and abroad and began to promote the construction of digital tourism footprint in Anhui Province, to build a modern tourism city woven by the Internet. At the same time, with the help of Internet media, Anhui Province will expand its international popularity by shooting documentaries and sending short videos, especially in the European and American markets, and strive to create a name card of a well-known province of international tourism.

5. CONCLUSION

This paper mainly studies the influencing factors of foreign exchange income of Tourism in Anhui province and the forecast of its future development. It mainly adopts the grey correlation analysis method and multiple regression model to carry out the research, and tests the results of the model. The prediction accuracy is relatively high, which can be used for prediction and research. Through the analysis of the research results, and innovative to promote the growth of foreign exchange tourism in Anhui province and inbound tourism

development planning to provide more feasible reference advice, which needs to further strengthen economic development, to create quality scenic spots, and strive to build into an international tourism province.

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Analysis on Water Environment Quality and Industrial Economy of Bengbu Based on Multiple Linear Regression

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Abstract: Industrial wastewater, as one of the main sources of water pollution in China, has been causing serious damage to the ecological environment, making it impossible to guarantee the normal water supply for residents in some areas and inhibiting the sustainable development of economy to a certain extent. In order to understand the relationship between environmental pollution and industrial output value, this paper takes Bengbu city as an example, takes natural precipitation water storage, river sewage discharge, water quality and other factors as explanatory variables, takes the month-on-month growth rate of industries above the scale as explained variables, sets up a multiple linear regression model, and quantitatively analyzes the impact of water environment on the growth of industrial output value. Based on the industrial development status of Bengbu City, this paper combines the industrial structure layout and pollution status of Bengbu city, and proposes Suggestions to promote the healthy and sustainable development of industrial economy.

Keywords: Water Pollution; Industrial Economy; Industrial Wastewater; Multiple Linear Regression Model; Sustainable Development

1. INTRODUCTION

Water is one of the basic resources for human survival and development. Since the reform and opening up, with the rapid development of the secondary industry in China, a large number of industrial wastewater discharge has caused serious pollution and damage to the regional ecological environment. Ding Jihong et al[1] based on the environmental Kuznet curve and the inverted u-shaped curve relationship between economic growth and environmental pollution, used principal component analysis to establish the comprehensive pollution index and study the two-way relationship between economic development and environment. In Zhi-Lai Zhou's research on industrial wastewater treatment methods, he analyzed the existing problems in China's industrial wastewater treatment and believed that the increasing of industrial wastewater discharge was mainly due to the high price of wastewater treatment equipment, ineffective supervision of government departments and inadequate policies.

Based on the quantitative analysis of the influencing factors of industrial wastewater by Hong-bin Xie and others[2], it is found that under the macro-control and

supervision of the government, there is no certain correlation between the increase of industrial output value and the increase of industrial wastewater discharge, which is mainly due to the strong regulatory restrictions of the local government and the local complete sewage treatment facilities.

2. CURRENT OVERVIEW

Bengbu is one of the important industrial city of anhui province, there is a big problem, its industrial structure and layout of a large number of industrial wastewater emissions, makes the bengbu water pollution phenomenon is relatively serious, half enterprises above designated size of the output value of industrial output from the chemical industry, brewing, printing and paper four pollution industry key enterprises, but the pollution load ratio is more than 80% [3]. Huaihe River is an important water source for Bengbu City. In the early stage, the upstream of Huaihe River was often flooded by sewage. The discharge of industrial sewage led to a sharp decline in water quality, and people could not guarantee their domestic water supply. Urban sewage treatment lags behind, and the treatment technology of industrial wastewater is more traditional. With the continuous increase of urban population, if the scale of sewage treatment plant construction is not expanded, and treatment capacity is increased, the water environment quality will further decline. In 2009, the completion of the second sewage treatment plant in Bengbu city has greatly reduced the discharge of industrial sewage and improved the water quality[4].

In 2018, the municipal government "bengbu water pollution prevention and control in 2018 work plan", to ensure the security of water ecological environment, strengthen the monitoring of water quality, prevent the pollution of groundwater, at the same time to clear water has been polluted waters activities, to ensure normal operation of facilities for central treatment of sewage and pipe network and national standards, industrial wastewater and domestic sewage should do, put an end to steal row, row, and so on and so forth.

3. EMPIRICAL RESEARCH AND ANALYSIS

3.1 DATA SOURECE

In order to analyze the relationship between water environment and the growth rate of industrial output value, a multiple linear regression model was established. By referring to a large number of literatures and referring to

the research reports of previous scholars, the growth rate of industrial added value above the scale in Bengbu city from 2000 to 2019 was selected as the explained variable, that is, the dependent variable. Explanatory variables for the factors about water environment quality, this article selected rainfall, annual runoff depth, groundwater resources, emissions into the river sewage, water supply, water quality III class above proportion and amount of water as explanatory variables for analysis. The data of this paper are from the Statistical yearbook of Bengbu city from 2000 to 2019.

3.2 MODEL BUILDING AND MODEL SOLUTION

In the multiple regression model, the explanatory variable is precipitation (X_1), annual runoff depth (X_2), groundwater resources amount (X_3), discharge of sewage into rivers (X_4), water supply (X_5), water quality III class above proportion (X_6) and total water resources (X_7). The explained variable is the growth rate of industrial added value above the scale (Y). The data from 2000 to 2019 are selected as sample data for parameter estimation. The multiple regression model is shown as follows:

$$\hat{Y}_i = 39.390 - 0.625X_1 - 0.007X_2 - 4.573X_3 - 0.709X_4 + 0.784X_5 - 15.890X_6 + 0.233X_7$$

(7.233) (0.142) (0.011) (0.617) (0.118) (0.372) (3.621) (0.261)

$$t = (5.446) (4.409) (-0.639) (-7.406) (-5.990) (2.110) (-4.388) (0.894)$$

$$R^2 = 0.928 \quad \bar{R}^2 = 0.886 \quad F = 22.067 \quad n = 20$$

From the preliminary analysis results, it can be seen that the determination coefficient R^2 is high, the joint significance test of F-test is passed, and the t-test of some explanatory variables is not significant, indicating the possible existence of multicollinearity.

3.3 PRELIMINARY TEST AND MODIFICATION OF THE MODEL

Table 1: Correlation Coefficient.

Correlation Coefficient	X_1	X_2	X_3	X_4	X_5	X_6	X_7
X_1	1.0000	0.8942	0.8100	0.0253	-0.4967	-0.1099	0.9299
X_2	0.8942	1.0000	0.7538	-0.1313	-0.6131	-0.3037	0.9314
X_3	0.8100	0.7538	1.0000	-0.3803	-0.7276	-0.4452	0.8931
X_4	0.0253	-0.1313	-0.3803	1.0000	0.4172	0.7470	-0.2058
X_5	-0.4967	-0.6131	-0.7276	0.4172	1.0000	0.6068	-0.6845
X_6	-0.1099	-0.3037	-0.4452	0.7470	0.6068	1.0000	-0.3237
X_7	0.9299	0.9314	0.8931	-0.2058	-0.6845	-0.3237	1.0000

From the table of correlation Numbers, it can be seen that the explanatory variables X_1 , X_2 , X_3 , and X_7 have a strong correlation, and at this time, the model has a relatively serious multicollinearity. In the case of multicollinearity, the variance of the parameter estimation will be overestimated, and the standard error will also increase,

Table 2: Stepwise Regression.

Order	Variable				Modified determinable coefficient	F-Statistics
1	—	—	—	X_6	0.153766	4.452410
2	—	X_3	—	X_6	0.249006	4.749896
3	X_1	X_3	—	X_6	0.540608	8.453009
4	X_1	X_3	X_4	X_6	0.867557	32.11460

Stepwise regression method was used to correct multicollinearity. First of all, a simple linear regression model is established between the explained variable y and

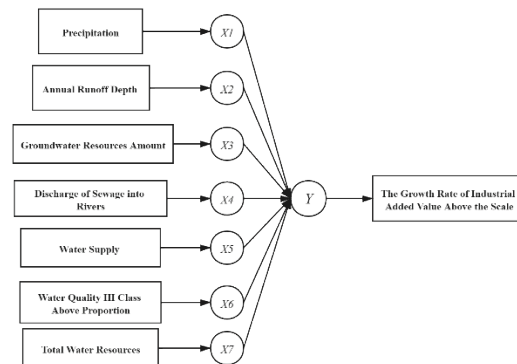


Figure 1: Multiple Regression Model.

Then the multiple regression model is as follows:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + u$$

Among them, the β_0 for the constant term, u as random disturbance, the 2000-2019, a total of 20 years of data into the Eviews is used to estimate parameters estimation results are obtained:

3.3.1 MULTICOLLINEARITY CHECK AND CORRECTION

According to the above analysis, the model may have multicollinearity. To prove the above guess, Eviews software is used to calculate the correlation coefficient between the explanatory variables X_1 , X_2 , X_3 , X_4 , X_5 , X_6 and X_7 :

which will lead to the increase of the confidence interval of the estimated parameter, and it is easy to make wrong judgment in the hypothesis test. It also leads to a high determination coefficient R^2 . The joint significance of F-test is also high, while t-test of some explanatory variables is not significant.

are compared to obtain the best fitting explanatory variable X_6 . On the basis of retaining X_6 , the variables X_1 , X_2 , X_3 , X_4 , X_5 , X_7 were added to establish a linear regression model. The resolvable coefficient R^2 , the modified decisive coefficient \bar{R}^2 , F-statistics and the value of parameter t-test of each model were compared again. The variable X_3 was retained, and the variables were continuously added to gradually regress:

$$\hat{Y}_i = 51.8662 + 0.6785X_1 - 4.7845X_3 - 0.7703X_4 - 12.0441X_6$$

$$(3.9347) (0.0792) (0.4938) (0.1211) (3.3917)$$

t

$$= (13.1816) (8.5655) (-9.6885) (-6.3638) (-3.5510)$$

$$R^2 = 0.8954 \quad \bar{R}^2 = 0.8676 \quad F = 32.1146 \quad n = 20$$

At this time, there is no serious multicollinearity in the model.

3.3.2 HETEROSCEDASTICITY TEST

In order to test whether the model has heteroscedasticity, White test can be used to test

$$nR^2 = 15.79491$$

The significance is $0.3261 > 0.05$, so the test number is not significant, that is, there is no Heteroscedasticity in the model, so the correction of heteroscedasticity is not needed.

3.3.3 AUTOCORRELATION TEST

The partial autocorrelation coefficient was used to test the model, and the method of delaying 12 periods was used to test the model (as shown in figure 2).

























Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
		1 0.040	0.040	0.0368	0.848
		2 -0.203	-0.205	1.0459	0.593
		3 -0.154	-0.142	1.6594	0.646
		4 0.063	0.033	1.7677	0.778
		5 -0.089	-0.160	1.9991	0.849
		6 -0.029	-0.029	2.0262	0.917
		7 0.244	0.231	4.0409	0.775
		8 -0.226	-0.340	5.9142	0.657
		9 -0.212	-0.105	7.7060	0.564
		10 -0.175	-0.229	9.0534	0.527
		11 0.205	0.026	11.102	0.435
		12 0.006	-0.070	11.104	0.520

Figure 2: Partial Autocorrelation Coefficient (PAC) test.

It can be seen from the table that the partial autocorrelation coefficients of the model lag for 12 periods do not exceed the threshold under a certain degree of confidence, and there is no autocorrelation in the model. The autocorrelation test of the model has passed, and there is no need to modify the model.

3.4 MODEL FINAL INSPECTION

(1) Test of Economic Significance. Through the preliminary test and modification of the model, the final selected explanatory variables are precipitation (X_1), groundwater resources (X_3), sewage discharge into the river (X_4) and the proportion of water quality above class III (X_6). From an objective point of view, precipitation is positively correlated with industrial output value; groundwater resources and industrial output value are negatively correlated, which is because the increase of industrial water consumption will increase the consumption of groundwater resources. The increase of river sewage discharge will inhibit the increase of industrial output value, which is due to the role of government macro-control; the increase of industrial

output value will affect the water quality to a certain extent, and the water quality will decline due to the discharge of industrial wastewater. The economic significance of each parameter in the model accords with the objective facts.

(2) Statistical Inference Test. The parameters of the model are estimated by the sample observation values of variables. In the previous analysis, there are tests on the significance and goodness of fit of the model, which can prove the reliability of the model and the significance of its parameters. The modified resolvable coefficient $\bar{R}^2 = 0.8954 > 0.85$ was significantly correlated, and the F-statistic was 32.1146. The goodness of fit and significance test of the model equation can show the reliability of the model. Under the condition of 95% confidence, the P values in the t-test of model parameters were all less than 0.05, and the parameter significance test also passed.

(3) Econometric Test. Through the autocorrelation test (PAC test) and heteroscedasticity test (white test), the results show that there is no heteroscedasticity and autocorrelation in the model. However, in the previous discussion, there has been a detailed improvement on the multicollinearity of the model. Finally, the model has no serious multicollinearity, and the econometric test of the model has passed.

4. CONCLUSION AND SUGGESTION

From the fitting degree and parameter form of the model, it can be concluded that there is a strong linear relationship between the regional industrial output value and the quality of water environment. There is a negative correlation between the natural water storage, sewage discharge into the river and the growth rate of the industrial output value above the scale, while the natural precipitation has a positive correlation with the growth rate of the industrial output value above the scale, which is mainly due to Bengbu City. The unique industrial structure layout is related. Based on the above model, the following suggestions are put forward:

(1) The government strengthens the supervision and control of pollution industries

When the amount of industrial wastewater discharged into the river is too large, it will inhibit the sustainable growth of industrial output value. The pollution load of chemical industry, brewing industry, printing industry and papermaking industry in Bengbu City accounts for a large proportion. It is difficult to control the discharge of industrial polluted wastewater in the city, which will greatly hinder the sustainable development of regional industrial economy. Therefore, the government should focus on the supervision of polluting enterprises, stipulate the discharge standards of sewage treatment, and require enterprises to strictly follow the treatment process to treat the sewage, and then discharge the sewage after reaching the standard. Strengthen the monitoring of water quality safety, make long-term plan and arrangement, and continuously improve the quality of water environment.

(2) Introduce advanced processing technology and strengthen infrastructure construction

Traditional treatment technologies have high cost and low treatment efficiency, but advanced treatment technologies

can fundamentally solve these problems. Only a few polluting enterprises discharge the sewage up to the standard, while most polluting enterprises have been unable to solve the problem of substandard sewage discharge due to the excessive cost of traditional sewage treatment. Advanced sewage treatment technology can achieve higher sewage treatment efficiency and improve water quality at lower cost. Meanwhile, strengthening basic sewage treatment facilities and reducing urban sewage discharge are also conducive to the sustainable development of industrial economy.

(3) Change the structure and distribution of industry

The large discharge of industrial wastewater in Bengbu city is mainly due to the unreasonable industrial structure and layout of the city. The total industrial output value of polluters accounts for a large proportion of the total industrial output value of enterprises above the municipal scale. However, these polluters have a high proportion of investment and a low recovery rate, especially in the printing industry and paper industry. We will clean up and rectify the pollution behaviors of these key polluting enterprises, and if necessary, close down or eliminate severely polluting enterprises, so as to improve the industrial structure and layout from a macroscopic perspective.

(4) Promoting water conservation

Government will strengthen water resources management. To include water licensing management institutions, and other large planning program in the use of water management, release list of monitored water unit, in accordance with the requirements for the supervision and administration of key monitoring water units, all the large key water units into national and local water resources management system, strict regulation. Accomplish the annual target of efficient water-saving irrigation. The reclaimed water, rain water and mine water unconventional water into the regional unified allocation of water resources.

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CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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Bond Decision Analysis Based on Logistic Regression Model

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Abstract: At present, the bank's investment decision in a company directly determines its profitability. Appropriate usage of a multivariate logisitical regression model can estimate the probability of default, which can enable the bank to make the best option indirectly. Firstly, the credit risk of many listed companies in different fields is used as a quantitative criterion and characteristic coefficients. Besides, it used to make a standard credit rating. Using this as a rule, it can count the credit ratings of different companies in emergencies. Then it can be used to help bank's investment decision. It is found that the results are reasonable and accurate.

Keywords: Logistical Regression Model; Probability of Default; Credit Evaluation; SPSS

1. INTRODUCTION

In the bank lending decisions, the unstable credit guarantees of micro enterprises and high financing risks are the main reasons why banks and other commercial institutions are unwilling to lend. Micro enterprises occupy a very important position in the national economy, which is a strong growth point for my country's economic growth. However, the current financial support of micro enterprises is far from meeting their development needs. In the conventional expert evaluation method, analytic hierarchy process and stepwise discrimination method need a large number of expert evaluations or important detailed index data. The high cost of obtaining information and ensuring the validity of the information are the main difficulty that hinders the common credit evaluation of small and medium-sized enterprises. It results that banks are unable to credit micro enterprises well. At present, most commercial banks have realized that the business of micro enterprises has become a new profit growth point. But most of their existing corporate credit rating models are applicable to large enterprises. Research has shown that there is significant difference in credit performance between large enterprises and small enterprises. It is important for the establishment of credit evaluation criteria for micro enterprises.

Secondly, in today's primary form of credit bonds, the bond credit ratings of many companies are also mere formalities, which hasn't much practical reference significance for banks. Often the error in credit ratings is a factor that the previous level did not consider. Therefore, if we want to improve the level of financial services and enhance the level of risk prevention, we need to find a convenient, effective and economical method of obtaining information and establish a supporting credit evaluation system. It will help banks make loan decisions for SMEs.

The data mining mentioned by Lu Chenis now a popular analysis method for commercial bank bond investment. It uses historical data to analyze and simulate future numbers. Zhou Hong and Lin Wanfa built a related model, which found that the information asymmetry of bond issuers and investors is positively correlated with their corporate credit spreads. Wang Yong used the KMV model to study that investment bonds also need to be based on local fiscal policies and conditions, the financial capabilities of enterprises, and local support for enterprises. This also confirms that market risk can affect the credit rating of a company. Experience has shown that the larger the scale of the enterprise, the more applicable the judgment standards applied in the industry will be suitable. Because the retail loans of micro enterprises have been increasing year by year, the profits of commercial banks have steadily increased. The vigorous development of retail loans for micro enterprises has significant influence on the future. However, with retail loans increasing, the number and probability of corporate defaults have also increased. Compared with large enterprises, micro enterprises are more susceptible to random economic fluctuations. Therefore, their relative default probability is also higher.

Aiming at the problem of commercial banks' profit, solving the credit guarantee problem of micro enterprises, the research methods and models have changed from linear regression to nonlinear regression. The Logistic model was firstly used by Martin to predict the company's bankruptcy and default probabilities. The data shows that whether foreign or domestic, it must judge the default risk probability of many commercial banks. Multi-objective decision-making solves the hindering influence of multiple decision factors on the Logistic model. Besides, the influence of covariance between each decision factor can be solved. Logisitic models have higher prediction accuracy than many neural network models, which makes up for the defects of least squares. All only needs to verify the correlation analysis of the factors that have an impact on the probability of default. A variety of data has verified that Logisitic model does not need to meet the law of normal distribution. It can also achieves the same accuracy. For the bank's evaluation of micro enterprises, only good and bad enterprises are classified. The result can be between 0 and 1. An accurate score is given between them so that banks can easily make bond investment decisions. Therefore, the Logisitic regression model has been widely used and valued in economic decision-making and management.

2. THE SOLUTION AND TESTING OF LOGISTICAL

MODEL

2.1 THE SOLUTION OF LOGISTICAL MODEL

2.1.1 RESEARCH IDEAS

Data collection and analysis were carried out, and it is for 302 listed companies that have been evaluated by experts. Logistical model and SPSS are used to calculate the correlation between the main factors of enterprises of different sizes and fields. Iterative algorithms were used to iterate, and it can dismiss the algebra. The regression value is obtained by the covariance test. The obtained results are compared with the actual analysis. The correctness and rationality of the model are tested. For companies of different nature, the expert evaluation method and the Logistical model are used for comprehensive comparison. A convincing model explanation is obtained. A better decision-making plan is simulated on the bank's bond investment amount.

2.1.2 LOGISTICAL REGRESSION MODEL

In the bond field, Logistical model has linear relationship between the natural logarithm of the ratio of corporate bond default, non-default and each characteristic factor. Compared with the Z-value model, the Logistical model does not require too large historical data support. It does not need to fully conform to the normal distribution. Compared to the neural network model, the Logistical model is easier to interpret. It does not require huge training samples. Compared with the KMV model, the Logistical model does not require too large default samples to simulate the corporate default probability in the future, which is in line with the current domestic market. Therefore, the Logistical model is more suitable for the domestic credit rating market in terms of sample and accuracy.

For SMEs, banks need to have a credit risk quantification

Table 1 SPSS Preliminary Results

Variable	B	Standard Error	Wald	Degree of Freedom	Significance	Exp(B)
Proportion of voided invoices	-1.65	2.591	0.408	1	0.523	0.191
Proportion of default invoices	11.549	28.902	0.160	1	0.689	10.367
Proportion of negative invoices	-3.105	3.299	0.885	1	0.347	0.045
Constant	1.520	0.327	21.541	1	0.001	4.572

In this way, the model formula of the bank's Logistical model for hundreds of randomly selected companies is as follows:

$$p = \frac{1}{1 + e^{-1.520 + 1.656x_1 - 11.549x_2 + 3.105x_3}}$$

When fitting and calculating the Logistical model in different economic fields, too large sample size will also cause large errors in the value. It results in unsatisfactory simulation results. At this point, further testing of the model is required.

For the test of regression coefficient:

$$w = \left(\frac{\beta_j}{SE\beta_j} \right)^2 \quad (3)$$

Among them, $SE\beta_j$ is the standard error. The obtained value of w is equal to or less than the critical value w_α . That is, it can be considered that the independent variable has an influence on the occurrence of the event. The acceptable test error of a commercial bank is almost 0.05,

standard in terms of strength and reputation as a lending strategy. In the economic field, Logistical model uses the probability of default as the criterion for judging default. Its value is distributed from 0 to 1, and most companies cannot completely make the probability of default close to 1 or 0. So its value can be used to show the good or bad degree of the company with data. In addition, Logistical model can also appraise the credit rating of enterprises considerably. It solves the difficulty of disorder of multi-categorical variables, which brings a lot of convenience in solving practical applications. According to the model:

$$p = \frac{1}{1 + e^{-s}}, \text{ among them } s = \beta_0 + \beta_1 x_1 + \dots + \beta_n x_n \quad (1)$$

$$p(y_i) = p_i^{y_i} (1 - p_i)^{1 - y_i} \quad (2)$$

x_k is characteristic factor variable when calculating the probability of default and evaluating the credit risk. β_n is the index coefficient before each feature factor. Through SPSS, it can use maximum likelihood regression calculation, and perform an iterative algorithm, which obtains various constraint results under restricted conditions. Therefore, the index coefficient of each feature factor can be obtained. p is the probability of default. The larger the value, the more it can indicate a type of enterprise with low default probability and high credit credibility. When the number of feature factors exceeds 3 or more, the accuracy of the model will be very close to the true value.

Calculating the corresponding characteristic factors for 302 listed companies, it can be found that the three characteristic factors, the proportion of invalid invoices, the proportion of default invoices, and the proportion of negative invoices are the most prominent factors. The average value of multiple companies is fitted, therefore it can:

so the bank can measure and evaluate the three characteristic factors.

Table 2 Validation Regression Coefficient

	W	W_α
Proportion of obsolete	0.408	0.408
Proportion of Default	0.159	0.160
Proportion of negative invoices	0.885	0.885

Under different regression coefficients, the basic and critical values are the same. The three characteristic factors also have a greater impact on the enterprise's default probability. Substituting it into equation (1), it gives a good effect and a high degree of simulation. At the same time, the enterprises are divided into three categories: large, medium, and small. SPSS is used to simulate and calculate the results of three sizes of enterprises. It can analyze the three dimensions.

When the bank's annual limit is fixed every year, the repayment ability and credit evaluation ability of the enterprise are integrated to divide the amount that different enterprises can repay. When the amount of bonds invested in a company is limited, the churn rate of customers will increase.

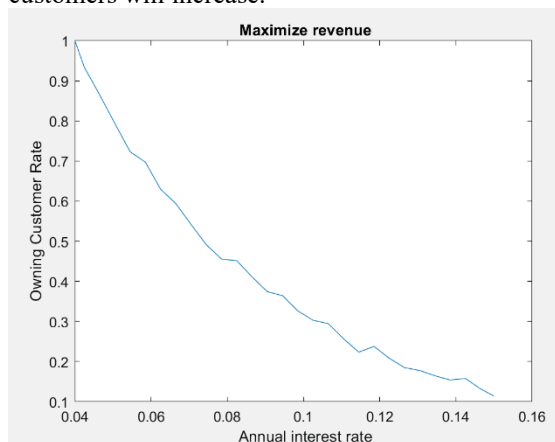


Figure 1 Owning Customer Rate

With the ever-increasing annual interest rate of banks, the number of customers owned by corporate customers will gradually decline. The default cut-off value of SPSS is 0.5. Banks can roughly divide the companies into two types of companies with large credit gaps, which is by the way of below and above the cut-off value. They also have more accurate and reasonable grasp of bond investment, in order to avoid excessive investment and small return. Removing the larger error extremes on both sides of the default probability, it can be made into a commercial bank's own credit rating setting range.

2.2 ANALYSIS OF BANK PROFIT STRATEGY

2.2.1 RESEARCH IDEAS

The return value based on the logisitical model is the probability of default. The default probability is calculated to quantify the credit evaluation of each enterprise. Using SPSS can carry out credit evaluation standards for credit risk factors. Classify enterprises into four grades: good, medium and bad. From this, we can get the number of good and bad enterprises among the enterprises.

Calculate the rate of return and annual profit based on the amount of bank loans and the actual profit. The value calculated when LINGO is used for linear programming (assuming that all enterprises above the difference category can borrow from the bank). It shows that companies can borrow more to achieve higher returns.

2.2.2 BANKS DEVELOPING STRATEGIES

When the bank can already lend to the determined enterprise limit, and the annual interest rate is determined. The customer churn rate is calculated, and the return is the highest. Judge the credit risk of premium enterprises. The companies whose evaluation criteria fluctuate within 0.05 are removed. Those companies that are significantly higher than the evaluation criteria are selected to allow banks to have an accurate grasp of corporate lending.

Logistic regression is a model based on linear regression. For variables such as enterprise size and risk value, the characteristic variables need to be standardized when the logistic regression value is adjusted. For discrete variables,

they are processed by grouping. For continuous variables, Min-Max is used for standardization.

$$x^* = \frac{x - x_{\min}}{x_{\max} - x_{\min}}$$

Among them, x^* represents the standardized value, x represents the original value, x_{\min} represents the minimum value of the variable, x_{\max} and represents the maximum value of the variable.

It can obtain in the credit rating of excellent enterprises. According to the proportion of negative invoices, it can be seen that the proportion of negative invoices of some companies is less than 1%. It can be seen that large companies with good credit still have insufficient working capital. It is also has set a fixed under the premise of the amount of money. The choice for such enterprises is not to give them loans. Count the remaining large companies in the superior category.

So set A_1 as the maximum loan amount for each enterprise. For the remaining small enterprises after the decision on credit risk of the premium category, if the probability of default does not exceed the evaluation criteria, they are discarded. We set the maximum loan amount for each company as A_2 .

In the same way, the good and medium-level large enterprises use the annual interest rate-the highest value of the customer churn rate. In this way, it can select the good and medium enterprises. It use B_1 , C_1 to represent the loanable amount.

The remaining small and medium-sized enterprises are also screened. The number of good-quality small and medium-sized enterprises is obtained. The number of medium and small-sized enterprises is set as B_2 , C_2 .

It is required that the proportion of large enterprises in each category must be greater than that of small and medium-sized enterprises. In this way, it can ensure that the bank's customer default rate will not be too large. Therefore, LINGO is used to perform linear programming for some of the selected enterprises. The calculated values are as follows:

Table 3 Type Distribution and Total

A_1	0.1845
A_2	0.1845
B_1	0.3309
B_2	0
C_1	0.2999
C_2	0

In response to this, according to these 6 different risks and different sizes of enterprises, we use SPSS to calculate the mean and standard deviation of the default probabilities. So that we can see that better comparisons and verifications can be found among enterprises of different sizes.

It can be seen that among the credit risk companies, the average value is only slightly higher than the evaluation standard. Therefore, banks need to be cautious in borrowing among companies. It increases the number of investments and reduces the amount of investment. The

profit cycle is as long as possible.

It can be seen that in the evaluation of premium credit, regardless of whether it is a large or small enterprise, banks try to give them loans as much as possible. They can fully drive economic development. In the good and medium credit evaluations, since the averages are not much different, we need to consider giving large companies more loans. This confirms that the calculated ratios are reasonable and beneficial to the bank's decision-making.

Regardless of whether it is excellent, good, or medium, the total proportion of large enterprises is basically more than 0.5. Excellent is 0.576, good is 0.512, and medium is 0.351. Therefore, the bank's investment decision depends not only on default. The probability also depends on whether the company is a large or small company.

3. CONCLUSION

In view of the bank's bond issuance strategy for micro enterprises and the data results, the bond quota issued by commercial banks to micro enterprises depends largely on the creditworthiness of the enterprises. Calculate the probability of default using the company's percentage of invalid invoices, default invoices, and negative invoices. Based on historical data and Logistical model, SPSS software is used to calculate the default probabilities of more than 600 listed companies. After verifying them, it is concluded that the model fits well. It can be known that the accuracy rate of companies that are not affected by major fluctuations in the Logistical model research, which is higher. The main goal of this paper is to calculate the value of default probabilities for various types of enterprises. Besides, it formulates most types of micro enterprises issuing bonds, which can be expanded to larger bond areas in the future.

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Combination Forecasting Model of Real Estate Price Based on GIOWPA Operator

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Abstracts: The combined forecasting model can obtain better forecasting value than single forecasting method, reduce the forecasting error of the system, and significantly improve the forecasting effect. In this paper, the National Bureau of Statistics collected the relevant data of real estate sales price from 2000 to 2018 for forecasting research. Firstly, exponential smoothing forecasting method, grey forecasting method and multiple stepwise regression forecasting method are selected to forecast the real estate price individually, then GIOWPA operator is introduced to regroup each different single forecasting model into a combined forecasting value with the forecasting accuracy at each time point as the induction value, and then the optimal combined forecasting model of vector cosine and GIOWPA operator is constructed based on the three single forecasting methods. Finally, the combined forecasting model is used to forecast the real estate price, and the results show that the combined forecasting model has a significant improvement in forecasting accuracy compared with other models.

Keywords: Combination forecasting; Exponential smooth prediction; Grey prediction; Multiple stepwise regression prediction; Cosine of vector included angle; GIOWPA opera

1. INTRODUCTION

With the current economy pursuing high-speed growth to high-quality growth, the development of the real estate industry has encountered brand-new problems. Although the real estate industry has been booming in terms of various indicators, the rapid development of the real estate industry has also brought a series of economic and social problems, so the prediction of real estate prices is very meaningful, which not only has certain help and guidance for buyers and sales of the real estate industry, but also helps the country to issue relevant policies and regulations to control economic operation and solve social problems^[1]. Literature [2] applied ARIMA model to the prediction and test of real estate prices, analyzed the data from the first quarter of 1998 to the third quarter of 2006, established a prediction model, and then forecasted the real estate prices in the fourth quarter of 2006 and the first quarter of 2007. Literature [3] firstly selected suitable indicators as candidates according to the objectivity and representativeness of indicators, then analyzed the relationship between independent variables and dependent variables by Granger causality test, and finally established

a leading indicator system based on vector autoregressive VAR model for forecasting. Literature [4] firstly used GM(1,1) model to predict the general development trend of real estate prices, then used Markov method to determine the transfer law, and combined grey GM(1,1) prediction with Markov prediction organically, which greatly improves the prediction accuracy of the model and achieves good results. In the literature [5], aiming at the present situation that the network big data is being used more and more, the network big data and neural network are used to analyzed and forecasted the housing price in Beijing. The network big data has the advantages of real-time performance, which greatly improves the forecasting accuracy. Literature [6] took Shanghai as an example, constructed the index system of influencing factors of commodity housing price, screened out the key indicators by principal component analysis, established a multiple regression model of influencing factors of market price, and drew the conclusion that the most important factor is supply and demand. Finally, GM(1,1) is used to forecasted and analyzed the market price. Literature [7] introduced the induced ordered weighted average (IOWA) operator, and put forward a new combined forecasting model with variable weight coefficient based on the sum of squares of errors, which can improve the precision of combined forecasting. Finally, an example analysis showed the effectiveness of the model. Literature [8] combined vector angle cosine with IOWGA operator, and put forward an optimal combination forecasting model of IOWGA operator based on vector angle cosine. The combination forecasting method is effective and reasonable through the combination forecasting of tax revenue.

Based on the existing literature, this paper selects the National Bureau of Statistics to collect the relevant data of the national real estate sales price from 2000 to 2018, and makes a combination forecasting research. Firstly, the data from 2000 to 2015 were used to build models, and three single forecasting methods, namely exponential smoothing forecasting method, multivariate stepwise regression forecasting method and grey forecasting method, were adopted. Secondly, GIOWPA operator was introduced, and each different single forecasting model was regrouped into a combined forecasting value with the forecasting accuracy at each time point as the induced value. The vector angle cosine was used as the optimal criterion to establish the optimal combined forecasting model of vector angle cosine and variable weight

coefficient of GIOWPA operator. Then use the data from 2016 to 2018 to test the model, and finally use the combined forecasting model to forecast the real estate price from 2019 to 2021. The results show that compared with single forecasting method, more accurate real estate price can be obtained.

2. INTRODUCTION TO INDIVIDUAL FORECASTING METHODS

2.1 Exponential smoothing prediction method

Exponential smoothing prediction method is a method to predict the future by weighted average of past observed values. This method stipulates that the predicted value in period $t + 1$ is equal to the weighted average of the actual observed value in period t and the predicted value in period t . In this paper, the average selling price of real estate collected by the National Bureau of Statistics from 2000 to 2015 is used to establish an exponential smoothing model. From the average selling price of real estate, it can be seen that it has an obvious upward trend, which shows that the cubic exponential smoothing method can be used to forecast the house price. The prediction formula of cubic exponential smoothing method is:

$$\hat{y}_{t+T} = a_t + b_t T + c_t T^2 \quad (1)$$

Parameters a_t , b_t and c_t in the model (1) are calculated as follows:

$$\begin{cases} a_t = 3S_t^{(1)} - 3S_t^{(2)} + S_t^{(3)} \\ b_t = \frac{\alpha[(6 - 5\alpha)S_t^{(1)} - 2(5 - 4\alpha)S_t^{(2)} + (4 - \alpha)S_t^{(3)}]}{2(1 - \alpha)^2} \\ c_t = \frac{\alpha^2(S_t^{(1)} - 2S_t^{(2)} + S_t^{(3)})}{2(1 - \alpha)^2} \end{cases}$$

Among them, $S_t^{(1)}$, $S_t^{(2)}$ and $S_t^{(3)}$ are the first, second and third exponential smoothing predicted values of the period, t is the cycle number of the model, and T is the number of predicted leading cycles [9].

2.2 Multiple stepwise regression prediction method

In practical problems, there are many different variables that affect the dependent variable. Selecting the independent variable with significant influence to build a model involves the problem of variable selection. Stepwise regression is an effective method to select important variables from many variables and an effective method to eliminate the collinearity between independent variables on the basis of multiple regression. A suitable model is established through the relationship between the dependent variable and the screened independent variable, and the value of the required dependent variable is predicted by this model [10].

The main steps are as follows: firstly, the explanatory variables are used for simple regression of each explanatory variable considered, then the remaining explanatory variables are gradually introduced based on the regression equation corresponding to the explanatory variable that contributes the most to the explanatory variables, and finally the final multivariate stepwise regression equation can be determined. After stepwise regression, the explanatory variables retained in the model are important and have no serious multicollinearity.

2.3 Grey prediction method

Grey prediction is a method to predict the system with uncertain factors. The future development trend of things can be predicted by identifying the difference degree between the development trends of system factors, that is, correlation analysis is carried out, and then the original data is generated and processed, the laws of system change are found out, the data series with strong regularity are generated, and then the corresponding differential equation model is established. [11]. The main steps are as follows:

(1) Testing and processing of data

In order to ensure the feasibility of the modeling method, it is necessary to check the known data columns. Calculate the grade ratio of the data. If all the grade ratios $\lambda(k)$ fall within the allowable coverage $(e^{-\frac{2}{n+1}}, e^{\frac{2}{n+2}})$, the series $x^{(0)}$ can be used as the data of the model GM(1,1) for grey prediction. Otherwise, it is necessary to transform the sequence $x^{(0)}$ to make it fall into the acceptable coverage. That is, take the appropriate constant C and make translation transformation: $y^{(0)}(k) = x^{(0)}(k) + c$, $k = 1, 2, \dots, n$

(2) Establish a model

Accumulate the original data once (AGO) to generate series: $x^{(1)} = (x^{(1)}(1), x^{(1)}(2), \dots, x^{(1)}(n))$

among them, $x^{(1)}(k) = \sum_{i=1}^k x^{(0)}(i)$, $k = 1, 2, \dots, n$.

Averaging sequence:

$$z^{(1)}(k) = 0.5x^{(1)}(k) + 0.5x^{(1)}(k-1), \quad k =$$

$$2, 3, \dots, n \text{ then } z^{(1)} = (z^{(1)}(2), z^{(1)}(3), \dots, z^{(1)}(n))$$

So the grey differential equation is established as follows: $x^{(0)}(k) + az^{(1)}(k) = b$, $k = 2, 3, \dots, n$

The corresponding whitening differential equation is: $\frac{dx^{(1)}}{dt} + ax^{(1)} = b$

In which a is called development coefficient and b is called grey action quantity.

Order:

$$u = (a, b)^T, \quad Y =$$

$$(x^{(0)}(2), x^{(0)}(3), \dots, x^{(0)}(n))^T,$$

$$B = \begin{bmatrix} -z^{(1)}(2) & 1 \\ -z^{(1)}(3) & 1 \\ \vdots & \vdots \\ -z^{(1)}(n) & 1 \end{bmatrix}$$

Then by the least square method, Find the $\hat{u} = (a, b)^T = (B^T B)^{-1} B^T Y$ that makes $J(\hat{u}) = (Y - B\hat{u})^T (Y - B\hat{u})$ reach the minimum value.

Then the formula of predicted value is:

$$\hat{x}^{(1)}(k+1) = \left(x^{(0)}(1) - \frac{b}{a}\right)e^{-ak} + \frac{b}{a}, \quad k = 1, 2, \dots, n-1$$

$$\text{And } \hat{x}^{(0)}(k+1) = \hat{x}^{(1)}(k+1) - \hat{x}^{(1)}(k)$$

(3) Check the predicted value

(3.1) Residual test: Let the residual be $\varepsilon(k)$. If $\varepsilon(k) < 0.2$, it can be considered as meeting the general requirements; If $\varepsilon(k) < 0.1$, it is considered to meet the higher requirements.

(3.2) Test of deviation of grade ratio: Let the deviation of

grade ratio $bep(k)$. If $p(k) < 0.2$, it can be considered as meeting the general requirements; If $p(k) < 0.1$, it is considered to meet the higher requirements.

3. CONSTRUCTION OF A COMBINED PREDICTION MODEL BASED ON VECTOR ANGLE COSINE AND GIOWPA OPERATOR

Definition 1^[12] Assume the data set $(\langle v_1, x_1 \rangle, \langle v_2, x_2 \rangle, \dots, \langle v_m, x_m \rangle)$ be a two-dimensional array containing m data, $L = (l_1, l_2, \dots, l_m)^T$ be the weighting vector corresponding to each element, L satisfy $\sum_{i=1}^m l_i = 1$, $l_i \geq 0, i = 1, 2, \dots, m$,
Order:

$$GIOWPA(\langle v_1, x_1 \rangle, \langle v_2, x_2 \rangle, \dots, \langle v_m, x_m \rangle) = \left(\frac{\sum_{i=1}^m l_i x_{v-index(i)}^{2\lambda}}{\sum_{i=1}^m l_i x_{v-index(i)}^\lambda} \right)^{\frac{1}{\lambda}}$$

GIOWPA is called generalized induced ordered weighted proportional averaging operator, in which $\lambda \in (-\infty, 0) \cup (0, +\infty)$ and v_1, v_2, \dots, v_m are induced variables, x_1, x_2, \dots, x_m is an element in the original data set, and $v-index(i)$ is the subscript of the i -th data after x_1, x_2, \dots, x_m is sorted according to v_1, v_2, \dots, v_m from high to low.

Definition 2^[13]. Order:

$$v_{it} = \begin{cases} 1 - |(x_t - x_{it})/x_t|, & |(x_t - x_{it})/x_t| < 1 \\ 0, & |(x_t - x_{it})/x_t| \geq 1 \end{cases}$$

Assuming that in a socio-economic phenomenon prediction problem, the actual value is $x_t, t = 1, 2, \dots, N$ and x_{it} represents the predicted value of the i single method at the t time, v_{it} is called the prediction accuracy of the single method at the time, $i = 1, 2, \dots, m, t = 1, 2, \dots, N$.

According to definition 1 and definition 2, let \hat{x}_t be the combined predicted value generated by $v_{1t}, v_{2t}, \dots, v_{mt}$ as the induced value at t time, where $t = 1, 2, \dots, N$, so we can get:

$$\hat{x}_t = GIOWPA(\langle v_{1t}, x_{1t} \rangle, \langle v_{2t}, x_{2t} \rangle, \dots, \langle v_{mt}, x_{mt} \rangle) = \left(\frac{\sum_{i=1}^m l_i x_{v-index(i)}^{2\lambda}}{\sum_{i=1}^m l_i x_{v-index(i)}^\lambda} \right)^{\frac{1}{\lambda}} \quad (2)$$

$$\text{Let } X = [x_1, x_2, \dots, x_N]^T, X_i = [x_{i1}, x_{i2}, \dots, x_{iN}]^T, \\ i = 1, 2, \dots, m, \hat{X} = [\hat{x}_1, \hat{x}_2, \dots, \hat{x}_N]^T$$

and X represent the actual value vector of prediction object, X_i represent the predicted value vector of i single prediction method, and \hat{X} represents the combined predicted value vector.

Definition 3^[14].

Order:

$$\eta_i = \frac{\sum_{t=1}^N x_t x_{it}}{\sqrt{\sum_{t=1}^N x_t^2} \sqrt{\sum_{t=1}^N x_{it}^2}}, \eta = \frac{\sum_{t=1}^N x_t \hat{x}_t}{\sqrt{\sum_{t=1}^N x_t^2} \sqrt{\sum_{t=1}^N \hat{x}_t^2}} \quad (3)$$

η_i represents the cosine of the included angle between the predicted value vector X_i and the predicted object actual value vector X of the i -th single prediction method, and η represents the cosine of the included angle between the combined predicted value vector \hat{X} and the predicted object actual value vector X .

Combining the expressions (2) and (3), since the cosine of vector included angle is used to measure the closeness between two vectors, the larger the cosine of vector

included angle, the closer the two vectors are. In this paper, In order to make the combined prediction value closer to the actual value, the optimal combined prediction model of GIOWPA operator based on vector included angle cosine can be constructed as follows: $\max \eta =$

$$\frac{\sum_{t=1}^N x_t \left(\frac{\sum_{i=1}^m l_i x_{v-index(i)}^{2\lambda}}{\sum_{i=1}^m l_i x_{v-index(i)}^\lambda} \right)^{\frac{1}{\lambda}}}{\sqrt{\sum_{t=1}^N x_t^2} \sqrt{\sum_{t=1}^N \left(\frac{\sum_{i=1}^m l_i x_{v-index(i)}^{2\lambda}}{\sum_{i=1}^m l_i x_{v-index(i)}^\lambda} \right)^{\frac{2}{\lambda}}}} \quad (*)$$

$$s. t. \begin{cases} l_1 + l_2 + \dots + l_m = 1 \\ l_i \geq 0 \end{cases} \quad i = 1, 2, \dots, m$$

Order $\eta \min\{\eta_i, i = 1, 2, \dots, m\}_{\min}$,

$\eta \max\{\eta_i, i = 1, 2, \dots, m\}_{\max}$.

η_{\min} represents the smallest cosine of the angle between m single predicted value vectors and actual value vectors, η_{\max} represents the largest cosine of the angle between m single predicted value vectors and actual value vectors, which is defined as follows:

Definition 4^[15]. Let $\eta(l_1, l_2, \dots, l_m)$ be the cosine of the included angle between the combined predicted value vector and the actual value vector of the combined forecasting model (*). If $\eta(l_1, l_2, \dots, l_m) < \eta_{\min}$, the combined forecasting model determined by the weight coefficient l_1, l_2, \dots, l_m is called inferior combined forecasting; if $\eta_{\min} \leq \eta(l_1, l_2, \dots, l_m) \leq \eta_{\max}$, it is called non-inferior combined forecasting; if $\eta(l_1, l_2, \dots, l_m) > \eta_{\max}$, it is called superior combined forecasting.

4. CASE ANALYSIS

4.1 Three single forecasting methods of real estate prices

4.1.1 Exponential smoothing prediction

The exponential smoothing prediction model is established by using the real estate price from 2000 to 2015. After studying and testing different smoothing coefficients, it can be determined that when the smoothing coefficient $\alpha = 0.25$, the prediction accuracy of the model is the best. At this point, the exponential smoothing prediction model is:

$$Y = 6535.997 + 606.799T + 15.721T^2$$

4.1.2 Multiple stepwise regression prediction

There are many factors influencing the price of real estate housing sales. This paper selects seven related variables from 2000 to 2015: national GDP (X_1), population (X_2), resident consumption level (X_3), real estate development enterprise land purchase cost (X_4), real estate development residential investment (X_5), real estate development enterprise completed housing cost (X_6), residential commercial housing sales area (X_7) to establish multiple stepwise regression prediction model. With $X_1, X_2, X_3, X_4, X_5, X_6$ and X_7 as independent variables and Y (real estate price) as dependent variable, stepwise regression analysis was carried out. after model identification, the remaining X_3, X_4 and X_7 were in the model with R^2 value of 0.998, which means that the independent variables X_3, X_4 and X_7 can explain 99.8% change of the dependent variable Y . Furthermore, the model passed the F-test ($F=2777.250, p=0.000 < 0.05$), indicating that the model is effective. The

corresponding model formula is: $Y=1075.493 + 0.110 \times X_3 + 0.033 \times X_4 + 0.023 \times X_7$

4.1.3 Grey prediction

Due to the level ratio of raw data:

$$\lambda = (0.966, 0.964, 0.952, 0.842, 0.888, 0.942, 0.856, 1.019, 0.802, 0.944, 0.946, 0.920, 0.928, 0.986, 0.917)$$

Not all $\lambda \in [0.982, 1.0098]$, so it is necessary to take the appropriate constant C and do translation transformation on the original data. When $c=45000$, all $\lambda \in [0.982, 1.0098]$, indicating that the transformed data is suitable for GM(1,1) model, at this time:

$$y^{(0)}(k) = (46948, 47017, 47092, 47197, 47608, 47936.96, 48119.25, 48645.18, 48576, 49459, 49725, 49993.17, 50429.93, 50850, 50933, 51473)$$

The values of development coefficient a, grey action amount b and posterior ratio C obtained after model construction are as follows:

$$a=-0.0075, b=45990.5031, C=0.0167$$

Table 1: Prediction value and prediction accuracy of single forecasting method.

Year	Actual value	Exponential smoothing prediction method		Multiple stepwise regression prediction method		Grey prediction method	
		Predicted value	Accuracy	Predicted value	Accuracy	Predicted value	Accuracy
2004	2608.00	2128.10	81.60%	2494.47	95.65%	2582.64	99.03%
2005	2936.96	2281.10	77.67%	2935.67	99.96%	2942.48	99.81%
2006	3119.25	2762.09	88.55%	3169.32	98.39%	3305.05	94.04%
2007	3645.18	3298.78	90.50%	3667.18	99.40%	3670.35	99.31%
2008	3576.00	3682.10	97.03%	3569.93	99.83%	4038.42	87.07%
2009	4459.00	4320.34	96.89%	4271.39	95.79%	4409.28	98.88%
2010	4725.00	4445.57	94.09%	4713.65	99.76%	4782.93	98.77%
2011	4993.17	5286.51	94.13%	5067.11	98.52%	5159.42	96.67%
2012	5429.93	5821.09	92.80%	5287.80	97.38%	5538.75	98.00%
2013	5850.00	6179.26	94.37%	5900.32	99.14%	5920.95	98.79%
2014	5933.00	6613.46	88.53%	5970.75	99.36%	6306.04	93.71%
2015	6473.00	7060.42	90.93%	6326.46	97.74%	6694.04	96.59%
2016	7203.00	7158.52	99.38%	7155.08	99.34%	7084.98	98.36%
2017	7614.00	7812.48	97.39%	7707.93	98.77%	7478.87	98.23%
2018	8544.11	8497.89	99.46%	8466.31	99.09%	7875.74	92.18%

4.3 Results and Analysis of Combination Forecasting Model

Table 2: Optimal weight coefficient under different λ values.

$\lambda=-3$	$\lambda=-1$	$\lambda=0.01$	$\lambda=1$	$\lambda=10$
I_1	0.8124436	0.8141808	0.8165639	0.8197971
I_2	0.1875564	0.1858192	0.1834361	0.1802029
I_3	0	0	0	0.0080502

Table 3: Forecast value and prediction accuracy of combined forecasting method in 2016-2018.

Combination forecast	2016	2017	2018
$\lambda=-3$	predicted value	7157.87	7664.97
	Prediction accuracy	99.99%	98.11%
$\lambda=-1$	predicted value	7157.88	7665.36
	Prediction accuracy	99.37%	99.33%
$\lambda=0.01$	predicted value	7142.92	7650.26
	Prediction accuracy	99.17%	99.52%
$\lambda=1$	predicted value	7157.90	7666.65
	Prediction accuracy	99.37%	99.31%
$\lambda=10$	predicted value	7157.60	7686.99

The posterior difference ratio $C=0.0167 \leq 0.35$, which means that the accuracy level of the model is very good. The prediction equation can be obtained from the above results:

$$\begin{aligned} \hat{y}^{(1)}(k+1) &= \left(y^{(0)}(1) - \frac{b}{a} \right) e^{-ak} + \frac{b}{a} \\ &= 6179015.08 \times e^{0.0075k} - 6132067.08, \\ k &= 1, 2, \dots, n-1 \end{aligned}$$

You can get: $\hat{x}^{(1)}(k+1) = 6179015.08 \times e^{0.0075k} - 6087067.08$,

$$k = 1, 2, \dots, n-1$$

4.2 Results of Single Forecast Model

The forecast value of real estate price from 2004 to 2018 can be calculated by using the single forecast model obtained by each single forecast method in Section 4.1 By comparing it with the actual value, the forecast accuracy of each single forecast method can be calculated. The results are shown in Table 1.

Prediction accuracy 99.37% 99.04% 99.37%

The first step of this paper is to use the prediction data and prediction accuracy of each single prediction method from 2004 to 2015 to construct a combined prediction model based on cosine of included angle vector and GIOFWA operator under different λ values; The second step is to use the data from 2016 to 2018 to test the accuracy of the model: Firstly, the predicted values of the single forecasting methods in the first step are sorted according to the accuracy and substituted into the formula (*), and the optimal weight coefficients under different λ values can be calculated (the results are shown in Table 2). Then, using the predicted value of each single prediction method from 2016-2018 and its prediction accuracy and the optimal weight coefficient under different λ values to calculate the combined prediction value of 2016-2018 and its prediction accuracy, The results are shown in Table 3. By comparing the forecasting accuracy of combined forecasting with different parameters in Table 3 and the forecasting accuracy of each single forecasting method

from 2016 to 2018 in Table 1, although the forecasting accuracy of each single forecasting method has reached a high level, it can be seen that the forecasting accuracy of combined forecasting with different parameters has been improved to some extent based on the forecasting accuracy of single methods, which shows that the combined forecasting model established in this paper can effectively improve the forecasting accuracy.

In order to further analyze the rationality of the combined forecasting model, this paper analyzes the forecasting results of various forecasting methods from five aspects:

Table 4: Error index values of various forecasting methods.

Prediction technique		Error indicators				
		SSE	MAE	MSE	MAPE	MSPE
Single forecasting method	Exponential smoothing prediction method	43510.05	96.40	69.53	0.01255	0.00911
	Multiple stepwise regression prediction method	17170.93	73.21	43.68	0.00936	0.00557
	Grey prediction method	478910.62	307.18	230.68	0.03745	0.02729
Combined forecasting model	$\lambda=-3$	7352.95	49.41	28.58	0.00635	0.00367
	$\lambda=-1$	7387.41	49.52	28.65	0.00637	0.00368
	$\lambda=0.01$	9787.20	55.36	32.98	0.00709	0.00420
	$\lambda=1$	7501.03	49.89	28.87	0.00642	0.00371
	$\lambda=10$	10330.56	57.54	33.88	0.00741	0.00437

It can be seen from the data in Table 4 that each error index value of the combined forecasting model with different values of several parameters is smaller than the

sum of squares error (SSE), mean absolute error (MAE), mean square error (MSE), mean absolute percentage error (MAPE) and mean square percentage error (MSPE) [17], and the results are shown in Table 4.

$$(1) SSE = \sum_{t=1}^N (x_t - \hat{x}_t)^2 \quad (2) MAE = \frac{1}{N} \sum_{t=1}^N |x_t - \hat{x}_t|$$

$$(3) MSE = \frac{1}{N} \sqrt{\sum_{t=1}^N (x_t - \hat{x}_t)^2} \quad (4) MAPE = \frac{1}{N} \sum_{t=1}^N \left| \frac{x_t - \hat{x}_t}{x_t} \right|$$

$$(5) MSPE = \frac{1}{N} \sqrt{\sum_{t=1}^N \left(\frac{x_t - \hat{x}_t}{x_t} \right)^2}$$

corresponding error index value of the single forecasting method, which further illustrates the effectiveness of the combined forecasting model established in this paper.

Table 5: cosine of vector included angle of single forecasting method and combined forecasting model

Prediction technique		Cosine value of vector included angle
Single forecasting method	Exponential smoothing prediction method	0.9998915
	Multiple stepwise regression prediction method	0.9999542
	Grey prediction method	0.9995126
Combined forecasting model	$\lambda=-3$	0.9999820
	$\lambda=-1$	0.9999819
	$\lambda=0.01$	0.9999816
	$\lambda=1$	0.9999814
	$\lambda=10$	0.9999725

According to table 5 and definition 4, it can be seen that the cosine of the vector included angle between the predicted value and the actual value of the combined forecasting model (*) with different parameters is larger than that between the predicted value and the actual value of each single forecasting method, which shows that the established combined forecasting model is superior combined forecasting, and once again proves the effectiveness of the real estate price combined forecasting model based on GIOFWA operator constructed in this

paper, so it can be used to forecast the real estate price in 2019-2021.

Due to the principle of continuity of prediction, if you want to predict the next k steps, use the fitting average accuracy $\frac{1}{k} \sum_{t=N-k+1}^N v_{it}$ of the i-th prediction method in the recent k period to reflect the prediction accuracy of the N+k period [17]. The prediction accuracy of 2019-2021 is calculated by this method, and the results are shown in Table 6.

Table 6: Forecast Value and Forecast Accuracy of Individual Forecasting Methods from 2019 to 2021.

Year	Exponential smoothing prediction method	Multiple stepwise regression prediction method	Grey prediction method
	Predicted value	Prediction accuracy	Prediction value
2019	9214.74	95.0104%	9337.70
2020	9963.03	95.1169%	10271.07
2021	10742.76	96.2145%	11242.94

According to the optimal weight coefficient (Table 2)

calculated by λ with different values before, and according

to the prediction value and prediction accuracy of each single prediction method from 2019 to 2021 in Table 6, the combined prediction value of λ with different values

from 2019 to 2021 can be calculated, the results are shown in Table 7.

Table 7: Forecast value of real estate price portfolio under different values.

Year	$\lambda=-3$	$\lambda=-1$	$\lambda=0.01$	$\lambda=1$	$\lambda=10$
2019	9138.49	9140.34	9142.87	9146.30	9235.74
2020	9972.37	9975.14	9978.93	9984.08	10117.20
2021	10838.10	10841.85	10847.00	10853.98	11033.73

5. CONCLUSION

In this paper, based on the real estate price data from 2000 to 2015, a combination forecasting model based on vector cosine and GIOWPA operator is established, and the combination forecasting model is tested by using the real estate price data from 2016 to 2018. the validity of the combination forecasting model can be demonstrated by three different methods, and then the national real estate price from 2019 to 2021 is accurately predicted by using the combination forecasting model. This combination forecasting method can be used not only in the real estate industry studied in this paper, but also in other industries, which can greatly improve the forecasting accuracy and provide more accurate information for statistical decision-making. However, in this paper, when selecting the parameters of the combined forecasting model for calculation, only some representative parameters are selected without discussing the forecasting situation of the combined forecasting model under all parameters. We will further study this issue in the future.

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Combined Prediction Model of Urban Unemployment Rate in China Based on GIOWA Operator

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Abstract: In this paper, GIOWA operator and grey trend correlation degree are introduced to construct the variable weight coefficient combination prediction model based on GIOWA operator and grey trend correlation degree, and the model is applied to the urban registered unemployment rate prediction after adjustment for example analysis. The results show that the model can effectively improve the prediction accuracy. Finally, sensitivity analysis was conducted on the representative intervals $[-3,0]$ and $(0,3]$ of the parameters λ in the model, to study the degree of influence on the weight, objective function value and error index of the combined prediction model when the parameters changed.

Keywords: Combination prediction; GIOWA operator; Grey trend correlation degree; Urban Unemployment rate in China

1. INTRODUCTION

Unemployment rate has always been one of the key data concerned by all countries in the world. It is closely related to the level of economic development and people's living conditions, and it is also the basis for the government to make macroeconomic policies. Since it takes a period of time for economic policies to produce effects from the formulation, promulgation and implementation, they are lagging behind. If the unemployment rate can be scientifically predicted and its changing trend can be analyzed in the future, then the disadvantages brought by policy lagging can be eliminated. At present, the traditional single prediction model is widely used to predict the unemployment rate in China, for example, Han Qingyan^[1](2013) established partial least squares regression prediction model for urban registered unemployment rate; Li Yifan^[2](2017) proposed to forecast the unemployment rate based on Holt-Winters model; Zhang Weize^[3](2017) took the unemployment rate of Nanyang City as the research object and established the BP neural network prediction model. Tan Li^[4](2009) proposed to build an autoregressed moving average (ARIMA) model for the training set based on the data from 1978 to 2007. Finally, this model was used to predict the urban registered unemployment rate data in the next five years. Fu Yanru^[5](2012) used MATLAB software to establish the BP neural network prediction model for the unemployment rate of the high knowledge group. Peng Geng^[6](2013) hierarchically established the

unemployment rate prediction model by using the keyword search data recommended by Google and the improved stepwise regression method, and conducted the causality test and validity test. Zhao Qingxia^[7](2010) established a vector error correction model to predict the unemployment rate. Chen Longying^[8](2010) proposed to predict the domestic unemployment rate in 2010 based on ECM model.

Due to the limited information contained in the single prediction model, there are some prediction errors more or less, so it may be difficult to get an accurate prediction result of the unemployment rate, while the combined prediction model can improve the shortcomings of the single prediction model to some extent. Bates and Granger first systematically studied combinatorial prediction methods in 1969^[9]. In the process of practice, compared with the single prediction model, the combined prediction model contains more comprehensive information, and can maximize the use of the effective information of various single prediction models, reduce systematic errors and risks, so as to improve the prediction accuracy of the model. Chen Huayou^[10](2003) proposed the induced ordered weighted average (IOWA) operator and applied it to the combination prediction model, which is essentially a new combination prediction model of variable weight coefficient. Subsequently, scholars successively proposed IOWGA operator, IOWHA operator, GIOWA operator, IGOWLA operator and IGOWC-OWGA operator and other information integration operators in different forms, and carried out research on different variable weight coefficient combination prediction models. Hu Lingyun^[11](2013) proposed the induced ordered weighted geometric average operator and applied it to the interval combination prediction problem to establish the combined prediction model of IOWGA operators at left and right endpoints. Zhang Xiaofang^[12](2016) proposed an OFDI portfolio prediction model based on IOWHA operator on the basis of multiple linear regression model, ARIMA model and gray prediction model. Yang Lei^[13](2013) proposed the generalized induced ordered weighted average operator on the basis of generalized average and established the combined prediction model of GIOWA operator with maximum and minimum closeness degree. Yuan Hongjun^[14](2016) proposed the inductive generalized ordered weighted logarithmic average operator and applied it to the interval combination

prediction problem to establish the combination prediction model of IGOWLA operators at left and right endpoints. Yuan Hongjun^[15](2016) organically combined C-OWGA operator and IGOWA operator into an induced generalized continuous interval ordinary-weighted geometric mean operator, and applied it to the interval combination prediction problem to establish a combination prediction model of IGOWC-OWGA operator based on the included Angle cosine of vectors. According to the existing literature, in the study of China's urban unemployment rate prediction problem, generalized induced ordered weighted averaging operator, construct the GIOWA operator of the gray trend relational variable weight coefficient of combination forecast model, and applies the model to adjust after the registered urban unemployment rate forecast, the example analysis shows that the model can get a more accurate prediction results, can effectively improve the prediction accuracy.

2. BASIC CONCEPTS

Definition 1: let

$$\xi_{it} = \begin{cases} 1 - |(y_t - y_{it})/y_t| & \text{when } |(y_t - y_{it})/y_t| < 1 \\ 0 & \text{when } |(y_t - y_{it})/y_t| \geq 1 \end{cases} \quad \text{In}$$

the formula: y_t represents the actual value at time t , y_{it} denotes the predicted value of the i single prediction method at the time t , ξ_{it} called the inducing variable of the i single prediction method at the time t , also known as the prediction accuracy.

Definition 2: Let's say I have m two-dimensional arrays, let $GLOWA_w((\xi_1, a_1), \dots, (\xi_m, a_m)) =$

$(\sum_{i=1}^m w_i a_{\xi - \text{index}(i)}^\lambda)^{\frac{1}{\lambda}}$ In the formula: w_i is the weight associated with the operator and has $\sum_{i=1}^m w_i = 1$, $w_i \geq 0$, $i = 1, 2, \dots, m$. $\xi - \text{index}(i)$ is ξ_1, \dots, ξ_m the index corresponding to the largest number in the order from the largest to the smallest, $GLOWA_w$ is an m -dimensional generalized induced ordered weighted average operator, or $GLOWA$ for short.

In definition 2, generalized induced ordered weighted average operator (GIOWA) is a more general ordered operator. The argument λ can be any number that is not zero. For example, when $\lambda = 1$, $\lambda \rightarrow 0$ and $\lambda = -1$ different operators such as IOWA operator, IOWGA operator and IOWHA operator can be obtained, and the corresponding expressions are:

$$\begin{aligned} & IOWA_w((\xi_1, a_1), (\xi_2, a_2), \dots, (\xi_m, a_m)) \\ &= \sum_{i=1}^m w_i a_{\xi - \text{index}(i)} IOWGA_w((\xi_1, a_1), (\xi_2, a_2), \dots, (\xi_m, a_m)) \\ &= \prod_{i=1}^m a_{\xi - \text{index}(i)}^{w_i} IOWHA_w((\xi_1, a_1), (\xi_2, a_2), \dots, (\xi_m, a_m)) \\ &= \frac{1}{\sum_{i=1}^m \frac{w_i}{a_{\xi - \text{index}(i)}}} \end{aligned}$$

Definition 3: let

$$\gamma = \frac{1}{n-1} \sum_{t=2}^n \frac{1}{1 + \alpha |y_t - \hat{y}_t| + \beta |(y_t - \hat{y}_t) - (y_{t-1} - \hat{y}_{t-1})|}$$

In the formula: $\{y_t, t = 1, 2, \dots, n\}$ is the actual sequence of values, $\{\hat{y}_t, t = 1, 2, \dots, n\}$ is a combinatorial sequence of predicted values, γ is the grey trend correlation between the combined predicted value sequence and the actual value sequence. Generally, the values of parameters α and β are 0.5 and 1. Where $\gamma \in [0, 1]$, the bigger γ is, the closer the combinatorial predictive value sequence is to the actual value sequence, the higher the prediction accuracy will be. If $\gamma = 1$ is true, it indicates that the combined predicted value sequence is equal to the actual value sequence, and the prediction effect is the best.

3. THE OPTIMAL COMBINATION PREDICTION MODEL BASED ON GIOWA OPERATOR AND GREY TREND CORRELATION DEGREE IS CONSTRUCTED

Suppose there are m prediction methods for the same problem, and the predicted value of the i th single prediction method at time t is y_{it} , y_t is the actual value at time t , $i = 1, 2, \dots, m$, $t = 1, 2, \dots, n$. The combined predictive value \hat{y}_t of GIOWA operator at time t can be obtained by treating m single prediction methods with generalized induced ordered weighted average operator:

$$\begin{aligned} \hat{y}_t &= GLOWA_w((\xi_{1t}, y_{1t}), \dots, (\xi_{mt}, y_{mt})) \\ &= \left(\sum_{i=1}^m w_i y_{\xi - \text{index}(it)}^\lambda \right)^{\frac{1}{\lambda}} \end{aligned}$$

The combined predictive value sequence $\{\hat{y}_t, t = 1, 2, \dots, n\}$ and the actual value sequence $\{y_t, t = 1, 2, \dots, n\}$ of the GIOWA operator obtained can be used to construct the variable weight coefficient combination prediction model based on GIOWA operator and grey trend correlation degree by using definition 2 and definition 3. The optimal combination prediction model is:

$$\begin{aligned} & \max \gamma(y_t, \hat{y}_t) \\ &= \frac{1}{n-1} \sum_{t=2}^n \frac{1}{\left\{ 1 + \alpha \left| y_t - \left(\sum_{i=1}^m w_i y_{\xi - \text{index}(it)}^\lambda \right)^{\frac{1}{\lambda}} \right| \right.} \\ & \quad \left. + \beta \left| \left(y_t - \left(\sum_{i=1}^m w_i y_{\xi - \text{index}(it)}^\lambda \right)^{\frac{1}{\lambda}} \right) - \left(y_{t-1} - \left(\sum_{i=1}^m w_i y_{\xi - \text{index}(it)}^\lambda \right)^{\frac{1}{\lambda}} \right) \right| \right\}} \\ & \quad s.t. \begin{cases} w_1 + w_2 + \dots + w_m = 1 \\ w_i \geq 0 \quad i = 1, 2, \dots, m \end{cases} \end{aligned}$$

In the formula: w_i is the weight associated with the GIOWA operator and has $\sum_{i=1}^m w_i = 1$, $w_i \geq 0$, $i = 1, 2, \dots, m$. $\xi - \text{index}(it)$ denotes the subscript corresponding to the i th largest single predictive value in $\xi_{1t}, \dots, \xi_{mt}$ in order from the largest to the smallest, and $\xi_{1t}, \dots, \xi_{mt}$ denotes the induction variable, $\lambda \neq 0$.

In the above optimal combination prediction model, different combinations of variable weight coefficients can be obtained when the parameter λ in the model is changed, when $\lambda = 1$, it is a combination prediction model of variable weight coefficient based on IOWA

operator and grey trend correlation degree, when $\lambda \rightarrow 0$, it is a combination prediction model of variable weight coefficient based on IOWGA operator and grey trend correlation degree; when $\lambda = -1$, it is a combination prediction model of variable weight coefficient based on IOWHA operator and grey trend correlation degree.

4. CASE ANALYSIS

Taking the urban registered unemployment rate from 2000 to 2018 as the original data, and based on the processing method in literature [16] and literature [17], using the

Table 1: Prediction values and accuracy of the three single prediction methods

Particular year	Measuring the urban unemployment rate y_t (%)	Principal component regression model		Polynomial prediction model		Grey prediction model based on initial value modification	
		Estimate	Forecast	Estimate	Forecast	Estimate	Forecast
		y_{1t}	accuracy	y_{2t}	accuracy	y_{3t}	accuracy
2000	8.27	9.09	0.90135	9.94	0.79753	-	-
2001	9.04	8.70	0.96252	9.26	0.97555	8.83	0.97599
2002	9.54	8.91	0.93418	8.63	0.90441	8.48	0.87558
2003	9.50	8.07	0.84948	8.05	0.84690	8.15	0.83430
2004	8.29	7.10	0.85603	7.53	0.90757	7.84	0.94175
2005	7.58	7.67	0.98894	7.06	0.93118	7.53	0.99362
2006	6.72	7.40	0.90002	6.65	0.98861	7.24	0.92848
2007	5.72	6.13	0.92835	6.29	0.90098	6.96	0.82205
2008	5.50	5.48	0.99654	5.98	0.91106	6.69	0.82144
2009	5.57	7.31	0.68840	5.73	0.97130	6.43	0.86697
2010	4.90	5.69	0.83833	5.54	0.86936	6.18	0.79280
2011	4.81	4.78	0.99444	5.40	0.87633	5.94	0.80896
2012	5.02	5.55	0.89542	5.31	0.94136	5.71	0.87919
2013	5.23	5.39	0.96790	5.28	0.98911	5.49	0.95236
2014	5.50	5.59	0.98366	5.31	0.96460	5.28	0.95695
2015	5.81	5.61	0.96490	5.39	0.92709	5.07	0.85424
2016	5.90	5.79	0.98146	5.52	0.93483	4.87	0.78863
2017	5.83	5.60	0.96114	5.71	0.97969	4.68	0.75652
2018	5.79	4.68	0.80717	5.95	0.97292	4.50	0.71361

According to the value of prediction accuracy, we can reorder the predicted values of single model y_{1t} , y_{2t} and y_{3t} , so that we can get three new series which are sorted according to the magnitude of the induced value, and then give the weights w_1 , w_2 and w_3 to the predicted values at different time points in the order from large to small induced values. Select the time from 2001 to 2018 to establish the combined forecasting model. In 2001, there is $t = 1, 2, \dots, 18$. Since there are three single prediction models, the weight vector $W = [w_1, w_2, w_3]^T$. Take the parameters $\alpha = 0.5$ and $\beta = 1$, in the grey trend correlation degree, and bring them into the combined forecasting model according to the value of induced variables. When the parameter λ takes different values, the weight vector W under different optimal criteria can be solved by using lingo software.

When $\lambda = 1$, the optimal combination forecasting model

$$\max \gamma(y_t, \hat{y}_t) = \frac{1}{17} \sum_{t=2}^{18} \frac{1}{1 + 0.5 |y_t - \prod_{i=1}^3 y_{\xi-index(it)}^{w_i}| + \left| (y_t - \prod_{i=1}^3 y_{\xi-index(it)}^{w_i}) - (y_{t-1} - \prod_{i=1}^3 y_{\xi-index(it-1)}^{w_i}) \right|}$$

$$s.t. \begin{cases} w_1 + w_2 + w_3 = 1 \\ w_i \geq 0 \quad i = 1, 2, 3 \end{cases}$$

$w_1 = 0.8865$, $w_2 = 0.1135$, $w_3 = 0$, grey trend correlation degree $\gamma_2 = 0.7145$, the combination forecast result is marked as \hat{y}_{2t} , which is shown in Table 2, the expression of combination forecasting model is as follows:

improved urban registered unemployment rate adjustment coefficient to calculate, the resulting urban registered unemployment rate is taken as the research object, abbreviated as y_t . First, three single item models for urban registered unemployment rate y_t are established, and the predicted results are denoted as y_{1t} , y_{2t} and y_{3t} respectively. Then, the prediction accuracy is calculated by definition 1, as shown in Table 1 below:

of variable weight coefficient based on IOWA operator and grey trend correlation degree is as follows:

$$\max \gamma(y_t, \hat{y}_t) = \frac{1}{17} \sum_{t=2}^{18} \frac{1}{\{1 + 0.5 |y_t - \sum_{i=1}^3 w_i y_{\xi-index(it)}| + |(y_t - \sum_{i=1}^3 w_i y_{\xi-index(it)}) - (y_{t-1} - \sum_{i=1}^3 w_i y_{\xi-index(it-1)})|\}}$$

$$s.t. \begin{cases} w_1 + w_2 + w_3 = 1 \\ w_i \geq 0 \quad i = 1, 2, 3 \end{cases}$$

$w_1 = 0.9786$, $w_2 = 0.0079$, $w_3 = 0.0135$. The grey trend correlation degree is $\gamma_1 = 0.7085$, and the combination forecast result is recorded as \hat{y}_{1t} . see Table 2 for details, the expression of combination forecasting model is as follows:

$\hat{y}_{1t} = 0.9786 y_{\xi-index(1t)} + 0.0079 y_{\xi-index(2t)} + 0.0135 y_{\xi-index(3t)}$ When $\lambda \rightarrow 0$, the optimal combination forecasting model of variable weight coefficient based on IOWGA operator and grey trend correlation degree is as follows:

When $\lambda = -1$, the optimal combination forecasting model based on IOWHA operator and grey trend correlation degree is as follows:

$$\max_{\gamma} \gamma(y_t, \hat{y}_t) = \frac{1}{17} \sum_{t=2}^{18} 1 / \left\{ 1 + 0.5 \left| y_t - \frac{1}{\sum_{i=1}^3 \frac{w_i}{y_{\xi-\text{index}(it)}}} \right| + \left| \left(y_t - \frac{1}{\sum_{i=1}^3 \frac{w_i}{y_{\xi-\text{index}(it)}}} \right) - \left(y_{t-1} - \frac{1}{\sum_{i=1}^3 \frac{w_i}{y_{\xi-\text{index}(it-1)}}} \right) \right| \right\} \text{ s.t. } \begin{cases} w_1 + w_2 + w_3 = 1 \\ w_i \geq 0 \quad i = 1, 2, 3 \end{cases}$$

$w_1=0.8893, w_2=0.1087, w_3=0$. The grey trend correlation degree is $\gamma_3 = 0.6821$, and the combination forecast result is marked as \hat{y}_{3t} . see Table 2 for details, the

expression of combination forecasting model is as follows:

$$\hat{y}_{3t} = \frac{1}{\frac{0.8893}{y_{\xi-\text{index}(1t)}} + \frac{0.1087}{y_{\xi-\text{index}(2t)}}}$$

Table 2: prediction results of three variable weight coefficient combination forecasting models

Time	Actual value y_t	Combined forecast value \hat{y}_{1t}	Combined forecast value \hat{y}_{2t}	Combined forecast value \hat{y}_{3t}
2001	9.0373	8.8271	8.8735	8.8886
2002	9.5384	8.9025	8.8778	8.8968
2003	9.5048	8.0751	8.0714	8.0879
2004	8.2938	7.8249	7.8015	7.8182
2005	7.5812	7.5278	7.5480	7.5627
2006	6.7230	6.6612	6.7113	6.7200
2007	5.7213	6.1437	6.1489	6.1605
2008	5.4952	5.4966	5.5317	5.5386
2009	5.5747	5.7615	5.8098	5.8149
2010	4.9000	5.5500	5.5572	5.5676
2011	4.8058	4.7996	4.8458	4.8496
2012	5.0204	5.3219	5.3405	5.3498
2013	5.2271	5.2877	5.2965	5.3067
2014	5.5027	5.5861	5.5596	5.5715
2015	5.8100	5.5971	5.5807	5.5927
2016	5.9043	5.7803	5.7629	5.7753
2017	5.8256	5.6927	5.6950	5.7069
2018	5.7928	5.9201	5.7892	5.7900

Table 3: prediction accuracy of three single prediction models

Time	Principal Model	Component Regression	Polynomial Model	Prediction	$GM(1,1)$ Model with Initial Value Modification
2019	0.9815		0.9348		0.7886
2020	0.9713		0.9573		0.7726
2021	0.9166		0.9625		0.7529

According to the prediction accuracy in Table 3, the forecast values of unemployment rate of the three single forecasting models in 2019-2021 are reordered. Finally, the combined forecast values of parameters $\lambda = 1$, $\lambda \rightarrow$

0 and $\lambda = -1$ can be obtained according to the former variable weight coefficient combination model, as shown in Table 4.

Table 4: combined forecast value of urban unemployment rate from 2019 to 2021

Particular year	Combination Forecasting Model ($\lambda = -1$)	Combination Forecasting Model ($\lambda \rightarrow 0$)	Combination Forecasting Model ($\lambda = 1$)
2019	4.8863	5.2105	4.7556
2020	4.8373	5.1625	4.6828
2021	6.5836	6.7936	6.9369

Table 5: prediction evaluation indexes of single prediction model and three special parameter combination prediction model

	MSE	MAE	MAPE	MSPE
Principal Component Regression Model	0.1712	0.5572	0.0842	0.0263
Polynomial Prediction Model	0.1535	0.5109	0.0742	0.0207
$GM(1,1)$ Model with Initial Value Modification	0.2170	0.8179	0.1360	0.0369
Combination Forecasting Model ($\lambda = -1$)	0.1049	0.2824	0.0411	0.0140
Combination Forecasting Model ($\lambda \rightarrow 0$)	0.1059	0.2857	0.0413	0.0140
Combination Forecasting Model ($\lambda = 1$)	0.1047	0.2872	0.0413	0.0138

The urban unemployment rate from 2019 to 2021 is predicted. Because of the lack of urban registered unemployment rate, the prediction accuracy can not be calculated according to the formula defined in definition

1. According to the principle of prediction consistency [10], this paper uses the fitting average precision of the i -th single prediction method in the latest K period to reflect the prediction accuracy of $n+k$ period in the

prediction interval, the formula is $\frac{1}{k} \sum_{t=n-k+1}^n \xi_{it}$. Where k is the step number of out of sample prediction, n is the observation year of sample data, and ξ_{it} is the prediction accuracy of the i single prediction method at the t time. From the previous calculation, the sample data $n = 18$. The forecast time range of urban unemployment rate is 2019-2021, so $k = 1, 2, 3$ is established. The prediction accuracy formula of 2019-2021 can be written in the form of $\sum_{t=18}^{18} \xi_{it}$, $\frac{1}{2} \sum_{t=17}^{18} \xi_{it}$ and $\frac{1}{3} \sum_{t=16}^{18} \xi_{it}$. Combined with table 1, the prediction accuracy of 2019-2021 can be calculated, as shown in Table 3.

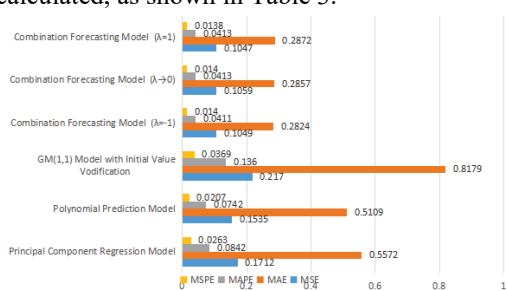


Figure 1: Comparison of evaluation indexes of each prediction method

It can be seen from table 5 and table 6 that the combined forecasting model based on GIOWA operator and grey

Table 6: grey trend correlation degree of single model and combination forecasting model

Prediction method	Grey trend correlation degree
Principal Component Regression Model	$\gamma_1 = 0.5784$
Polynomial Prediction Model	$\gamma_2 = 0.6451$
GM(1,1) Model with Initial Value Modification	$\gamma_3 = 0.5896$
Combination Forecasting Model of IOWA Operator and Grey Trend Correlation Degree	$\hat{\gamma}_1 = 0.7085$
Combination Forecasting Model of IOWGA Operator and Grey Trend Correlation Degree	$\hat{\gamma}_2 = 0.7145$
Combination Forecasting Model of IOWHA Operator and Grey Trend Correlation Degree	$\hat{\gamma}_3 = 0.6821$

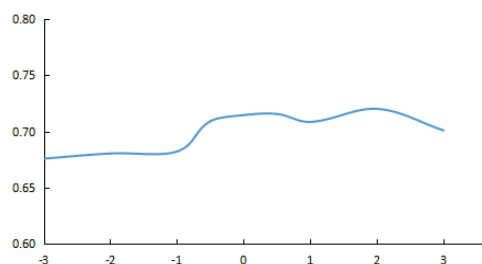


Figure 2: the change of objective function with different parameters

Figure 2 shows the change of grey trend correlation degree in parameter interval $[-3, 0)$, $(0, 3]$. Looking at Figure 2, the value of the objective function does not change significantly in the interval $[-3, -1]$, which is close to 0.655. In the rest of the interval, the overall change is in the form of waves, with rise and fall, but all values are always greater than 0.65. Combined with table 6, it can be seen that the objective function value in the interval range is always greater than that of the three single model, that is, the combination model with parameters in the interval $[-3, 0)$, $(0, 3]$ is superior.

trend correlation degree is proposed, when three special parameters $\lambda = 1$, $\lambda \rightarrow 0$ and $\lambda = -1$ are selected, the error indexes MSE, MAE, MAPE and MSPE of the combined forecasting model are smaller than those of the single model, and the grey trend correlation degree of the combined forecasting model is greater than that of the three single forecasting methods. It shows that the combined forecasting model proposed in this paper can effectively improve the prediction accuracy. By observing table 5 and table 6, it is found that although the prediction accuracy of the combined forecasting model with the three values of parameter λ is higher than that of the three single models, and all of them are superior combination forecasting, the error index and grey trend correlation degree under different parameters are still quite different, indicating that the prediction effect of the combined model is affected by the parameters λ , therefore, it is necessary to do sensitivity analysis on the combination forecasting model, and study how the corresponding error index and grey trend correlation degree change when the parameter λ changes. But the value of parameter λ in the operator is infinite. This paper will focus on the influence of parameter λ in the interval $[-3, 0)$, $(0, 3]$ on the objective function value, weight and error index of the combined forecasting model.

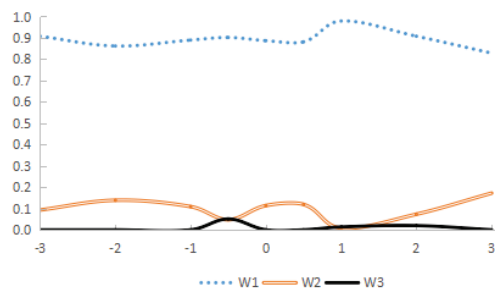


Figure 3: changes of w_1 , w_2 and w_3 with different values of λ

Figure 3 shows the variation of weights w_1 , w_2 and w_3 given to the predicted values at different time points in the parameter interval $[-3, 0)$, $(0, 3]$ in the order from large to small induced values, in other words, at a certain time point, the weight w_1 is given to the largest prediction accuracy, followed by w_2 , and the worst prediction accuracy is w_3 . According to figure 3, the weight w_1 does not change significantly in the interval $[-3, 0)$, $(0, 0.5]$, which is close to 0.9. Then it increases to $\lambda = 1$ to get the maximum value, and then decreases; Firstly, the weight w_2 changes gently in the parameter interval $[-3, -1]$, and then the wave form on $[-1, 0)$, $(0, 3]$ presents wave form, with increasing and decreasing; $w_3 = 0$ always holds in the interval $[-3, -1]$, the interval $[-$

1,0) increases first and then decreases, and there is fluctuation in the interval (0,3), but it is close to 0. In short, for weights w_1, w_2 and w_3, w_1 is greater than w_2 and w_3 in the interval $[-3,0)$, (0,3], which indicates that the method with the maximum prediction accuracy at each time point should be given the maximum weight.

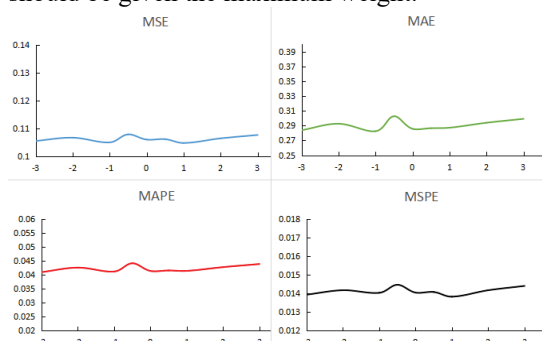


Figure 4: Changes of four error indexes with different values

Figure 4 shows the variation of error evaluation index with parameters in the interval $[-3,0)$, (0,3]. It can be seen from Figure 4 that MSE is approximately 0.105 in the interval $[-3,-1]$, and fluctuates violently on $[-1,0)$, (0,1], and then increases gradually; Mae fluctuates gently in the interval $[-3,-2]$, (0,3], and increases first and then decreases on $[-1,0)$; MAPE is close to 0.04 in the interval $[-3,-1]$ and (0,3], and the fluctuation is not obvious, which increases first and then decreases in the interval $[-1,0)$; the fluctuation in MSPE interval $[-1,0)$, (0,1] is relatively large, and gradually increases in the interval [1,3], and $[-3,-1]$ is approximately 0.014. Although the changes of the four error evaluation indexes in the interval range are different, their maximum values are always smaller than the three single prediction models, that is, when the parameters are in the interval $[-3,0)$, (0,3] In other words, the forecasting effect of the combined forecasting model based on the operator and grey trend correlation degree is better than that of the single model.

5. CONCLUSION

In this paper, by introducing GIOWA operator and grey trend correlation degree, a variable weight coefficient combination forecasting model of the revised urban registered unemployment rate based on GIOWA operator and grey trend correlation degree is established. Firstly, based on the revised adjustment coefficient of urban registered unemployment rate, the obtained urban registered unemployment rate is empirical analysis data, and three single forecasting models are established, and the prediction accuracy is calculated according to the predicted values of the models; Then the variable weight coefficient combination forecasting model is established. The empirical results prove the effectiveness of the model, and the forecast value of urban unemployment rate from 2019 to 2021 is given; Finally, the sensitivity analysis of the parameters in the interval $[-3,0)$, (0,3] shows that the prediction accuracy of the combined forecasting model based on GIOWA operator and grey trend correlation degree is always higher than that of the three single forecasting models in the interval $[-3,0)$, (0,3], indicating that the combined forecasting model proposed in this

paper can improve the prediction accuracy of unemployment rate.

ACKNOWLEDGMENT

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Credit Decision Analysis Based on RAROC Model and EL Model

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Abstract: Aiming at the problem of analyzing credit strategy in question C of the 2020 National College Student Mathematical Modeling Contest, this paper establishes the ROAROC model, the Expected Loss model and the principal-agent model based on the sales volume and amount of different companies given in the competition in recent years. Besides, it uses Excel and python software to process the data and set a unified standard credit rating. Therefore, it gets the annual interest rate collection and loan limit for small and medium-sized enterprises.

Keywords: Credit Decision; RAROC Model; EL Model; Principal-agent Model; Python Software; EXCEL

1. INTRODUCTION

In practice, due to the relatively small scale of micro enterprises and lack of mortgage assets, banks usually provide loans to enterprises with strong strength and stable supply-demand relationship based on credit policies, corporate transaction bill information and the influence of upstream and downstream enterprises. And it can give preferential interest rates to companies with high reputation and low credit risk[1]. Banks firstly evaluate the credit risk of micro enterprises based on their strength and reputation. Then it determines whether to lend and credit strategies such as loan limits, interest rates, and maturity based on factors such as credit risk[10].

It uses the RAROC model-based credit risk analysis of iron and steel enterprises published by Chen Mengling in 2017, and the RAROC loan pricing model for state-owned commercial banks published by Bian Junjie in 2008 and the RAROC model mentioned in the application[2,3]. Peng Liangyu published the expected loss model mentioned in the discussion on the expected credit loss valuation model of the accounts receivable of construction machinery enterprises in 2020[4]. Wang Chunlei researched on the scoring rules of the paper based on the multi-task principal-agent model in 2020 Xu Guangjian in 2020 published solution to the implementation dilemma of the policy: based on the principal-agent model mentioned in the multi-task principal-agent model[5, 6], it observes input invoice information and output invoice information and other factors to determine the lending standard. Besides, it defines a unified standard credit rating score passed calculating the credibility and the annual interest rate standard mainly solves the problem: quantitative analysis of the credit risk of 123 companies, giving the bank's credit strategy for these companies when the total annual credit is fixed[7-9]. The credit risk of 302 companies is quantitatively analyzed, and the credit

strategy for these companies is given when the total annual credit is 100 million yuan[11]. When the production, operation and economic benefits of the company are affected by sudden factors, the sudden factors often affect different industries. Different types of enterprises will have different impacts[12-15]. Comprehensively considering the impact of the credit risk on each enterprise and the impact of possible sudden factors on each enterprise, the bank's credit adjusts strategy when the total annual credit is 100 million yuan.

2. DATA SOURCES AND MODEL ASSUMPTIONS

The topic of this paper comes from the category C questions of the 2020 National College Student Mathematical Modeling Contest. In order to solve the problem, the following hypotheses are put forward: (1) Assume that internal debt and external taxes are not concerned about the impact of corporate credit; (2) Assume that the enterprise is only affected by the impact of force majeure events; (3) It is estimated that the net income in the second half of 2020 is only related to the changes in the impact surface and the value of the impact surface; (4) The bank temporarily does not refer to the corporate accounting statements when the total annual credit is fixed.

3. QUANTITATIVE ANALYSIS OF SREDIT RISK OF 123 COMPANIES AND THE CREDIT STRATEGY FOR THESE COMPANIES WHEN THE TOTAL ANNUAL CREDIT IS FIXED

3.1 DATA PROCESS AND SOLVING METHODS

According to the data of 123 companies given by the 2020 National College Student Mathematical Modeling Contest Category C, the data is processed. The processed data is classified and summarized. The annual tax payable of each company is calculated, and the number of invalid invoices is counted and organized into table. It uses python to write a program to count the total output minus input price tax for each year of 2017-2019, the total output minus input price tax for the total year, the number of invalid invoices for the output input, and the calculation. According to the RAROC model and the expected loss (Expected Loss) model formula based on the statistical data, a unified standard reputation rule is formulated to calculate the creditworthiness of each enterprise. The creditability of the bank provides suggestions for the credit strategy of these enterprises can be given when the total annual credit amount is fixed.

3.2 RESEARCH PROCESS

RAROC can achieve the unification of performance, risk and time limit, which is suitable for the problem-solving ideas of this time. Finally, the bank adjusts the parameters

of risk appetite to maximize benefits.

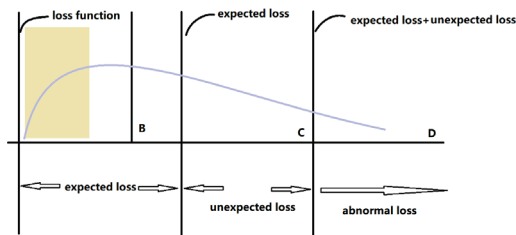


Figure 1 Expected loss and unexpected loss

$$q = d - c - y \quad (1)$$

$$d = x * 1 \quad (2)$$

$$c = x * zc + wz \quad (3)$$

$$EL = EAD * PD * E[LGD] \quad (4)$$

Among them: q represents the income of the bank. d represents the loan income. c represents the cost and expense. y represents the expected loss. x represents the amount of credit. l represents the interest rate. ZC represents the cost of funds. WZ represents the cost of unbringing funds. EL represents the expected loss. $E[LGD]$ represents the mean value of LGD. LGD is regarded as a variable, which represents the distribution of loss rate after default. That is, the distribution of $lossrate|D = 1$. PD represents the probability of default. The data is processed into python runnable data according to each year. The collated data is processed by python into the credit rating, default and the output of each year[11] minus the input price tax and other data. According to the data after the operation, it makes a linear statistical graph, as shown in Figures 2 and 3.

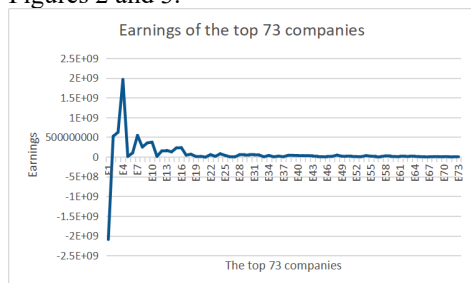


Figure 2 Revenue of the top 73 companies

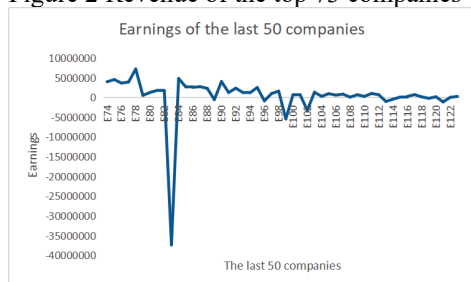


Figure 3 Income of the bottom 50 companies In calculating the credibility by setting a uniform standard of credibility rating, set the score of A as 20 points accumulated, B as 15 points accumulated, C as 10 points accumulated, and

Table 1 Annual interest rates and loan lines of 123 companies

Enterprise code	interest rate/%	Loan limit/10,000 yuan	Enterprise code	Annual interest rate/%	Loan limit/10,000 yuan	Enterprise code	Annual interest rate/%
E1	15	10	E26	5.64	100	E52	13.44
E2	5.64	100	E27	5.64	100	E53	8.24
E3	6.68	80	E28	6.94	73	E54	5.9

D as 5 points accumulated. If the company defaults, no points will be added. If there is no default, 15 points will be added. If the total output-input price tax of each company in 2017 is positive, then five points will be added. If it is negative, no points will be added. The same applies to 2018 and 2019. The total output item-input price tax is based on 10 levels 8 to reach each level, which corresponds to the credit score of the number of levels * 4, and the 10 levels are -1690000000---1280000000\--1280000000---870000000\--870000000---460000000\--460000000---50000000\--50000000--360000000\360000000--770000000\770000000--1180000000\1180000000--1590000000. According to the number of invalidated invoices of each enterprise's input, it is also divided into 5 grades and one grade plus one point. The 5 grades are 125-152, 152-304, 304-456, 456-608, and greater than 608. Similarly, the number of voided invoices for output items is also divided into 5 levels, which are less than 240, 240-480, 480-720, 720-960, and greater than 960. Use this method to find the credibility of each company. As shown in Figure 3, after comparing the credit status of various companies for quantitative analysis, referring to the credit risk, the bank's credit strategy for these companies is given when the total annual credit is fixed.

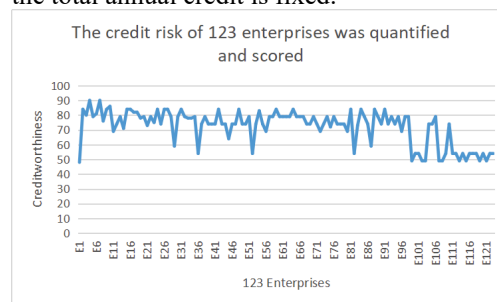


Figure 4 Quantitative scoring of credit risk of 123 companies

3.3 RESULT ANALYSIS

$$n = 15 - (xy - 48) * 0.26 \quad (5)$$

$$DK = 10 + (XY - 70) * 7 \quad (6)$$

Among them: n represents the annual interest rate. XY represents the creditworthiness. DK represents the loan amount in ten thousand yuan. From Figure 4, it can be seen that most of the 123 companies have a reputation of 80. A few companies have very good reputations, and some companies have a reputation of no more than 50. In this regard, we initially lent most of the credit to companies with good reputation and very good reputation, and loaned a minority of credit to companies with poor reputation. Set a uniform standard credit value according to the creditworthiness of each enterprise, and use the formula to obtain the annual interest rate and loan line strategy for these enterprises when the total annual credit amount in Table 1 is fixed.

Conclusion: Fix the value of the total annual credit of each enterprise in the bank calculated in the table to make specific credit borrowing limits and annual interest rates for these enterprises.

4. QUANTITATIVE ANALYSIS OF THE CREDIT RISK OF 302 COMPANIES AND THE CREDIT STRATEGY FOR THESE COMPANIES WHEN THE TOTAL ANNUAL CREDIT IS 100 MILLION YUAN

4.1 DATA PROCESSING AND MODEL ESTABLISHMENT

According to the data of 302 companies given by the 2020 National College Students Mathematical Modeling Contest Category C questions, it sorts out the required annual output and input price tax total, the number of invalid input invoices, the number of invalid output invoices, and the income. The data is processed into python runnable data for each year. According to the compiled data, the program is compiled and run to obtain data such as the customer churn rate and the total annual output minus the input price tax of each company.

The principal-agent model refers to the fact that banks want companies to choose actions based on the bank's credit benefits, but banks cannot directly observe what companies do with these loans. They can only observe other variables such as input invoice information and output invoice information. These variables are jointly determined by the actions of the enterprise and external random factors.

4.2 RESEARCH METHODS

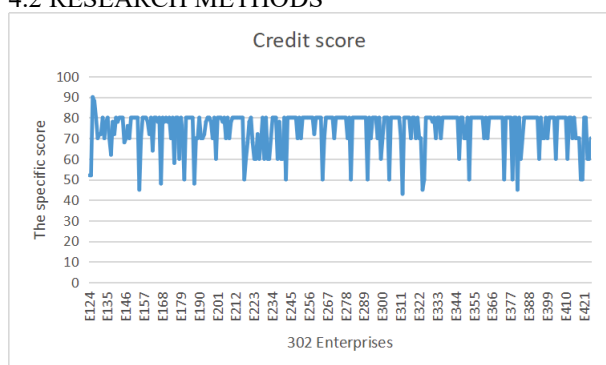


Figure 5 Credit scores of 302 companies

Use python software to sort out 11 data, such as the customer churn rate of each company, 2017 output-total input price tax, 2018 output-total input price tax, 2019 output-total input price tax, number of invalid input invoices, number of invalid output invoices, income.

Table 2 Credit and percentage annual interest rates and loan limits calculated by some companies

Company Code	Company Name	Credit	Percentage/%	Annual Interest Rate/%	Loan Limit/Yuan
E124	Self-employedE124	52	0.231152205	13.96	23115220.48
E125	Self-employedE125	52	0.231152205	13.96	23115220.48
E126	Self-employedE126	90	0.400071124	4.08	40007112.38

Conclusion: Fixing the value of the total annual credit of each enterprise in the bank calculated in the table, it can make specific credit borrowing limits and annual interest rates for these enterprises.

5. CREDIT ADJUSTMENT STRATEGY WHEN THE TOTAL ANNUAL CREDIT IS 100 MILLION YUAN

5.1 DATA PROCESS

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$$XB = XY + g \quad (7)$$

Among them: XB represents the reputation percentage. XY represents the reputation degree. g represents the total reputation score of each enterprise. Based on this information, we set a unified standard reputation rating to calculate the reputation value of each company. The algorithm is firstly determine the 2017 output of each company-the total input price tax, the 2018 output-the total input price tax, the 2019 output. Whether the total input price tax is greater than 0, if it is greater than 0, the reputation value is added 10 points. Secondly, the profit is judged, the higher the profit, the higher the score. It finds the largest profit and the smallest profit among 302 companies, and calculates the difference between the two divide into 10 equal parts. If it is less than the minimum value, it adds 5 points. It adds 10 points between the first equal division, adding 15 points between the second equal division and so on. It adds 50 points when the return reaches the maximum. Thirdly, it comes to judging. The lower the number of invalid invoices, the higher the score. The difference between the maximum value and the minimum value is divided into 5 equal parts. 10 points are added to those less than the minimum value. 8 points are added between the first equal parts, and so on. In the maximum interval, it adds 2 points. Fourthly, it determines how many output items of each company have invalid invoices. The score is used to calculate the credibility shown in Figure 5. According to the formula, the reputation percentage can be calculated.

According to Figure 5, it can be seen that most of the 302 companies have a reputation of around 80. A very small number of companies have very good reputations, and some companies have a reputation of no more than 50. In this regard, we initially lent most of the loans to reputable and very creditworthy companies, and loaned a small number of loans to less creditworthy companies.

3.2 RESULT ANALYSIS

$$n = 15 - (xy - 48) * 0.26 \quad (8)$$

$$DK = 10 + (XY - 70) * 7 \quad (9)$$

Among them: XY stands for credibility. n stands for annual interest rate. d stands for loan amount unit of 10,000 yuan. Set a uniform standard interest rate value according to the creditworthiness of each enterprise, and it obtains the annual interest rate and loan line strategy of the bank in Table 2 for these enterprises when the total annual credit amount is fixed according to the formula.

Force majeure factors will have more or less impact on different industries and different types of enterprises. The calculated data of 302 credit risks are used to calculate the turnover rate and the number of turnover days. Through the inquiry of data, various industries will face the different types of shock. The enterprise finally finds the credit adjustment strategy of the bank when the total

annual credit is 100 million yuan based on the changes in the impact surface and the value of the impact surface.

5.2 RESEARCH METHODS

$$CH = \frac{YY}{CP} = \frac{(XJ-JJ)}{(XS-JS)} \quad (10)$$

$$CZ = \frac{360}{CL} \quad (11)$$

Among them: CH means inventory turnover rate. YY means operating cost. CP means average inventory. XJ means output invoice amount. XS means output invoice quantity. JJ means input invoice amount. JS means input invoice quantity. CZ means inventory turnover days. CL represents inventory turnover rate. The companies that have obvious impacts in the face of force majeure are petroleum, coal, shipping, foreign trade, and finance. Those that have greater impacts are tourism, movies, hotels, and catering. Those with medium impact are in

technology. The interests of pharmaceutical and game companies are relatively improved.

5.3 RESULT ANALYSIS

$$n = 15 - (XX - 40) * 0.26 \quad (12)$$

$$D = \frac{XX}{\frac{Z}{\frac{100000000}{100000}}} \quad (13)$$

Among them, n represents the annual interest rate. XX represents the credit score. D represents the loan amount. Z represents the total credit of the company. 100 million represents the approximate total credit worth of all companies. 10,000 represents the total credit actually obtained by all companies. According to the relevant data of 302 companies with no credit records, a quantitative scoring problem was performed. A uniform standard reputation value was set, and the credit strategy shown in Table 3 was calculated according to the formula.

Table 3 Some corporate creditworthiness, percentage, annual interest rate and loan amount

Compa ny code	Estimated net income in the second half of 2020/yuan	Compa ny code	Estimated net income in the second half of 2020/yuan	Compa ny code	Estimated net income in the second half of 2020/yuan
E124	-28080781.73	E225	30070671.96	E326	3121561.694
E125	17903718.02	E226	-1761105.135	E327	9336173.225
E126	537711982.6	E227	3506279.911	E328	7224540.226

Conclusion: According to the annual credit limit of each enterprise in the bank obtained in the table, we can make specific credit borrowing limit and annual interest rate strategy for these enterprises.

6. CONCLUSION

The RAROC model, the expected loss model, the principal-agent model and the credit rating scores that define a unified standard are used through the above three questions. After the credit is calculated through the calculation, the annual interest rate and loan amount standards that should be charged are calculated. Because the reputation value of each company is regulated by a uniform standard, and the dependent variables participating in the cumulative reputation include the customer churn rate, the total output minus the input price tax for each year from 2017 to 2019, and the total output minus the input price tax. The number of invalidated output invoices, the number of invalidated input invoices, and the total income, etc., so as to ensure that the credibility is closer to fair. The annual interest rate and loan amount calculated by the credibility are closer to fair.

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Empirical Analysis of the Influence of Regional Differences on College Students' Physical Health

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Abstract: In view of regional differences in the physical health of college students, depending on the sample data about physical health test, firstly, through K-W test, the regional differences of college students' physical health by gender were analyzed, the results showed that there were obvious regional differences on boys' standing long jump, boys' 1000 meters running project and girls' 800 meters running project. Secondly, using Rank-sum ratio method to study the physical condition of college students in various regions, it turned out that students in southern China have the best physical fitness and students in northern China have the worst physical fitness. At last, comprehensively analyzing the reason and giving the reasonable suggestions to improve the physical health of college students.

Keywords: College students' physical health; Regional differences; K-W test; Rank-sum ratio; Empirical analysis

1. DATA SOURCES AND BASIC ASSUMPTIONS

In recent years, the physical condition of college students has been declining[1]. As the main force of future social development, college students should not only have strong cultural qualities, but also have strong physical fitness. Therefore, the physical health of college students is the cornerstone of national rejuvenation and social progress. Due to differences in geographic location, climate, environment, economic development, eating habits and other aspects have certain impacts on college students' physical health. For this reason, based on the relevant data of universities recruiting students nationwide, this paper studies and analyzes the physical health of college students from the perspective of regional differences. The research and analysis of physical health provide a theoretical basis for the management of colleges and universities to improve the physical health of college students, and on the other hand, it also provides a reference for related departments of colleges and universities on how to improve college students.

This article focuses on the physical test data of 2016 students from Anhui University of Finance and Economics. A total of 5314 pieces of data are collected, and 5107 pieces of valid data remain after the outliers are eliminated through SPSS19.0[2]. Taking into account the impact of gender differences on the experimental results[3], this paper randomly selected 25 sets of data

from each region according to gender, a total of 350 data. Among them, the regions are divided into seven regions: East China, North China, Northeast China, Central China, Southwest China, Northwest China, and South China according to different administrative regions, without considering the administrative zones. In order to deal with the problem conveniently, the following hypotheses are put forward: (1) All the students have no equipment failure during the test. (2) There is no error caused by the carelessness of the recorder. (3) The difference in physical condition of different students during the test has negligible influence on the test results. (4) Each set of data represents the true physical fitness level of each student.

2. QUANTITATIVE ANALYSIS OF THE PHYSICAL HEALTH OF COLLEGE STUDENTS IN VARIOUS REGIONS BASED ON K-W TEST

2.1 Research Ideas

Firstly, the original data after sampling is processed, the BMI value is converted into a score for research[4], and then classified by gender, and K-W is used to test whether there are regional differences in the various indicators of college students' physical examination[5]. For the indicators that produce regional differences, a box plot is further made and paired comparisons are performed to obtain specific differences in regions, and the reasons for regional differences are analyzed based on actual conditions.

2.2 Research Methods

The Kruskal-Wallis test of multiple independent samples is a generalized average rank test. As a non-parametric statistical method, it breaks the constraint that the population must obey the normal distribution, and can easily test whether the distributions of multiple populations are significantly different. The basic method is:

first mix each group of data and arrange them in ascending order, calculate the rank and sum of ranks of each group, and then calculate the rank sum statistics:

$$K-W = \frac{12}{n(n+1)} \sum_{i=1}^k n_i \left(\frac{\bar{R}_i}{n_i} - \frac{n+1}{2} \right)^2$$

$$= \frac{12}{n(n+1)} \sum_{i=1}^k n_i \frac{\bar{R}_i}{n_i} - 3(n+1)$$

Among them k is the number of sample groups, n is the

total number of samples, and n_i is the sample size of the i -th group.

According to the null hypothesis H_0 that needs to be tested, the distributions from multiple independent populations are not significantly different, and under the conditions of a given significance level $\alpha = 0.05$, the test is performed in two cases:

- (1) When $k = 3$ and $n_i \leq 5$, when the P value corresponding to $K - W$ is less than 0.05, it can indicate that there are significant differences in the distribution of multiple independent populations.
- (2) When $k > 3$ or $n_i > 5$, $K - W > \chi_{0.05}^2(k - 1)$, it can indicate that there are significant differences in the distribution of multiple independent populations. After obtaining the conclusion that the distribution of each population is significantly different, we can make further comparisons in pairs.

Pairwise comparison formula after K-W test:

$$\Delta \bar{R}(\text{crit.}) = t_{(n-k, \alpha/2)} \cdot \sqrt{\frac{n(n+1)(n-1-H)}{12(n-K)} \left(\frac{1}{n_i} + \frac{1}{n_j} \right)}$$

Table 2 K-W test results of boys group

Project	BMI	Vital capacity	50-meter running	Standing long jump	Sit and reach	1000-meter running	Pull-ups
Significant	0.815	0.272	0.057	0.003	0.314	0.008	0.345

It can be seen that the progressive significance of the standing long jump and the 1000-meter run is $P < 0.05$, indicating that these two indicators are different in the region. Make the figure 1 and figure 3 of these two indicators and compare them in pairs to analyze the differences in regions.

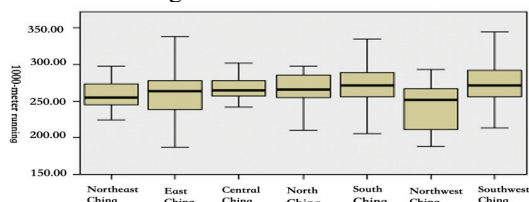


Figure 1: Independent sample Kruskal-Wallis test.

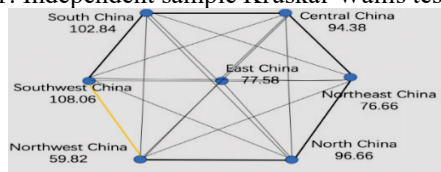


Figure 2: Pairwise comparison of regions.

In the 1000-meter running, it can be seen from the figure 2 that students in the northwest region have better long-distance running results, but their results are more scattered. Although the results of Southwest and South China are relatively concentrated, the results are not very good. Through pairwise comparison, as for the figure 3, it can be seen that the difference between Southwest and Northwest is the most obvious, with a P value of only 0.016.

Among them, $\Delta \bar{R}(\text{crit.})$ is equal to the critical value of the difference between the rank mean of the i -th group and the j -th group. d is the sample size of group e , n_j is the sample size of group j .

2.3 Result analysis

The indicators studied in this article include BMI, vital capacity, 50-meter running, standing long jump, sit and reach, 1000-meter running (800-meter running), and pull-ups (sit-ups). Among them, BMI is the body mass index. We classify BMI according to the Chinese reference standard. At the same time, for the convenience of processing, we conduct research on the score of BMI in Table 1.

Table 1 BMI classification standards

	Lean	Normal	Overweight	Obesity
BMI	< 18.5	18.5-23.9	24-26.9	≥ 27
Score	80	100	80	60

By using SPSS19.0 to perform K-W test on the male group data, the test results can be obtained, as shown in Table 2.

distance running results, but their results are more scattered. Although the results of Southwest and South China are relatively concentrated, the results are not very good. Through pairwise comparison, as for the figure 3, it can be seen that the difference between Southwest and Northwest is the most obvious, with a P value of only 0.016.

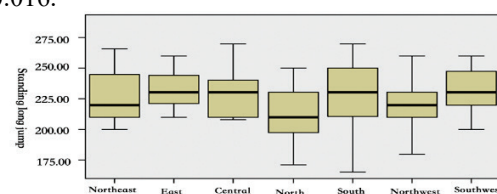


Figure 3: Independent sample Kruskal-Wallis test.

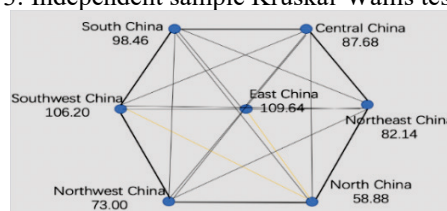


Figure 4: Pairwise comparison of regions.

Project	BMI	Vital capacity	50-meter running	Standing long jump	Sit and reach	800-meter running	Sit-ups
Significant	0.428	0.106	0.416	0.207	0.639	0.000	0.941

In the standing long jump program in the figure 3, students in North China are generally worse than those in other regions. The distribution of long jump performance in Northwest China is relatively concentrated, while that in

South China is more scattered. Through pairwise comparison, as for the figure 4, it can be seen that the differences between Southwest and North China, and North China and East China are the most obvious, with P

values of 0.018 and 0.007 respectively.

Similarly, the female group test results that can be obtained through SPSS 19.0 are shown in Table 3:

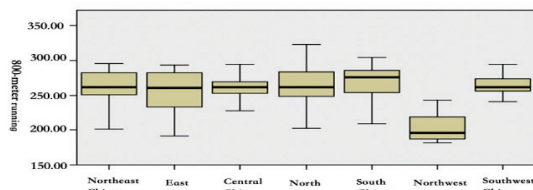


Figure5: Independent sample Kruskal-Wallis test.



Figure6: Pairwise comparison of regions

It can be clearly seen that there are obvious regional differences in the 800-meter running in the female group, and its progressive significance $P=0.000$. At the same time, it can be seen intuitively from the figure 5 and figure 6 pairwise comparisons that the 800-meter running in the northwest region is significantly better than other regions. In addition, the performance of Southwest and Central China is relatively stable and concentrated, while the performance of East China is relatively scattered.

To analyze the reasons for the regional differences between long-distance running and standing long jump, it is necessary to consider the endurance and jumping ability of long-distance running and standing long jump. In terms of climate and temperature, the northwestern region is dominated by a temperate continental climate, with little precipitation, dry climate, low temperature, and severe winters. People need to take in more calories. The temperature difference between morning and evening is large, and people have relatively better endurance. In the southern region, there are many rainy seasons throughout the year, and the outdoor sports environment is easily affected. In addition, the lack of indoor sports facilities has an adverse effect on the exercise of college students. From the perspective of dietary habits, wheat is the main food in the north, while rice is the main food in the south. Compared with rice, wheat is more easily absorbed by the human body and has more energy. Moreover, China's large-scale animal husbandry bases are mainly distributed in the northwest region, the per capita protein intake in the north is high and the physical fitness is better. At the same time, the good physical test results of university growth

Table 4 "National Student Physical Health Standard" College Student Evaluation Item Weight

Project	BMI	Vital capacity	50-meter running	Sit and reach	Standing long jump	Pull-ups	1000-meter running
Weights	0.15	0.15	0.2	0.1	0.1	0.1	0.2

Then the 350 sets of data are processed, and the average value of each indicator in each region is obtained by gender. The unary linear regression equation of the male group is calculated by MATLAB software: $RSR = 0.1837 + 0.0738\text{probit}$, the unary linear regression equation of the female group is: $RSR = 0.4811 +$

running and standing long jump are also inseparable from the attention of the local education department in recent years. Increased policy support and education will improve the physical fitness of students.

3.COMPREHENSIVE EVALUATION OF THE PHYSIQUE AND HEALTH LEVEL OF COLLEGE STUDENTS BASED ON THE RANK SUM RATIO STATISTICAL METHOD

3.1 Research Ideas

First, according to the "National Student Physical Health Standard", weighting coefficients are assigned to each indicator, and then the sampled data is processed, and the average value of each indicator in each region is obtained by gender classification. Based on the mean value, rank-sum ratio statistical method was adopted to comprehensively evaluate the overall physical health level of college students in various regions[6], and the physical health status of college students in various regions was ranked.

3.2 Research Methods

The rank sum ratio statistical method is proposed by Professor Tian Fengtiao to obtain the rank sum ratio RSR through rank conversion, and on this basis, the parameter statistics method is used to study the distribution of RSR, and the RSR estimated value calculated by the regression equation is used to synthesize the evaluation object Method of evaluation. The specific steps are:

- (1)Compile the ranks and calculate the rank sum ratio: Rank the mindicators of the n evaluation objects from small to large, and mark the obtained rank matrix as $(R_{ij})_{m \times n}$, and calculate $RSR: RSR_i = \frac{1}{n} \sum_{j=1}^m \lambda_j R_{ij}$, where λ_j is the weight of the j -th evaluation indicator.
- (2)Calculate the probability unit and linear regression equation: By compiling the RSR frequency distribution table, calculating the cumulative frequency P_i , and converting the cumulative probability into a probability unit probit_i , and then using RSR as the dependent variable and probit as the independent variable for regression analysis to construct the linear regression equation $RSR = a + b \times \text{probit}$.
- (3)Sorting by file: According to the RSR estimated value RSR_{fit_i} calculated by the linear regression equation, the evaluation object is comprehensively evaluated.

3.3 Analysis of results

First of all, according to the "National Student Physical Health Standards", weighting coefficients are assigned to various indicators, as shown in Table 4:

0.1717probit.

At the same time, the cumulative probability, probability unit and weighted rank sum ratio estimated value of male and female students in each region are obtained, as shown in Table 5:

It can be seen that, regardless of whether the male or

female group, the overall physical health of college students is better in South China and Northwest China, and the worst is in North China. It further proves that

factors such as eating habits, climate environment, and national policies have an important influence on the physical health of college students.

Table 5 Cumulative probability, probability unit and weighted rank sum ratio estimates

Region	Male					Female				
	RSR	pi	probit _i	RSRfit _i	Rank	RSR	pi	Probit _i	RSRfit _i	Rank
North China	0.37	0.14	3.93	0.47	7	0.50	0.14	3.93	0.549	7
Northeast China	0.44	0.29	4.43	0.51	6	0.47	0.29	4.43	0.557	6
East China	0.66	0.43	4.82	0.54	5	0.67	0.43	4.82	0.564	5
Central China	0.65	0.57	5.18	0.56	4	0.61	0.57	5.18	0.570	4
Southwest China	0.53	0.71	5.57	0.60	3	0.61	0.71	5.57	0.577	3
Northwest China	0.82	0.86	6.07	0.63	2	0.61	0.86	6.07	0.585	2
South China	0.52	0.96	6.80	0.69	1	0.53	0.96	6.80	0.598	1

4.CONCLUSIONS AND RECOMMENDATIONS

Through the above-mentioned experimental analysis, we found that there are indeed regional differences in the physical fitness of college students, and analyzed the reasons for the regional differences. At the same time, a comprehensive evaluation of the overall physical fitness level of each region was also carried out. Accordingly, we put forward the following suggestions to improve the overall physical fitness of college students:

(1)Healthy diet. Good eating habits can improve the physical health of college students, so balanced and healthy eating habits are essential. Refusal to overeating, eating fish, shrimp and vegetables can supplement sufficient protein and vitamins required to ensure scientific nutrition and a healthy diet.

(2)Improve sports facilities. Outdoor sports of college students are easily affected by the weather. Therefore, the establishment of indoor gymnasiums and active opening to the outside world, improving sports facilities and sports conditions, and meeting students' fitness needs, can increase the enthusiasm of college students to exercise and play an important role in improving the physical health of college students.

(3)Strengthen policy support. The state should strengthen its attention to the physical health education of college students and formulate a sound physical fitness evaluation system. Schools should also take measures to introduce physical education into university education as a compulsory course, actively encourage students to exercise outdoors, link sports performance to credits, strictly enforce them, and create a good atmosphere for national fitness.

5.ACKNOWLEDGMENTS

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6.DATA AVAILABILITY STATEMENT

Data source statement: The data in this paper come from Question D of Anhui Province College Students Mathematical Modeling simulation Competition.

7.CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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Quantitative Analysis of the Factors Influencing the Development of Anhui Life Insurance Based on Grey Correlation Method

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Abstract: For the influencing factors of life insurance development. Firstly, select the statistical data of Anhui Province from 2000 to 2018, and use the grey correlation analysis method to analyze the main influencing factors of the development of Anhui's life insurance industry from an empirical perspective. The results show that the per capita disposable income among economic factors is the main influencing factor. Secondly, using the ARIMA model to predict the life insurance market size of Anhui Province in the next five years, the results show that the development potential is huge, and it is expected to reach 94.715 billion yuan in 2023. Finally, based on the empirical results, specific suggestions for accelerating the development of the life insurance industry in Anhui Province are proposed.

Keywords: Life Insurance; Influencing Factors; Grey Relational Analysis; ARIMA Model; Quantitative Analysis

1. INTRODUCTION

In recent years, with the aging population in China becoming increasingly serious, pension security issues have become a social hot spot. Under this background, the development of life insurance will usher in a golden period. However, China's insurance industry started later. As a branch, the market of life insurance is still in the initial stage of development. Both the depth and density of insurance are far from developed countries. This shows that the development of life insurance in China has a very broad prospect. Although Anhui life insurance develops rapidly in recent years, there is still a certain gap compared with other provinces and cities.

China's life insurance started later than that of developed countries. After decades of rapid development, life insurance business has become one of the most important branches of the current insurance industry. Fan Gang Zhi [1] believes that the family structure has a significant impact on the demand for life insurance products. The Probit and Tobit empirical results show that the aging population will have a restraining effect on the demand for life insurance products. Based on the questionnaire survey, Liu Kunkun [2] uses factor and cluster analysis to analyze the factors affecting the insurance consumption behavior and different insurance consumer groups, and concludes that the income level is the basic factor limiting the insurance consumption. Wang Yuan [3] in the study of the

factors affecting the investment demand of life insurance in Anhui Province, through the establishment of ECM model, quantitative analysis of the impact of various indicators on the life insurance demand of residents in Anhui Province, believes that social security expenditure has a positive impact on the density of life insurance.

Through the above literature and research, we can roughly understand the current situation of the development of life insurance and the main factors affecting the development, which has a significant reference value for the research in the field of life insurance. Based on the above existing research results, this paper takes Anhui Province as an example, uses grey correlation analysis to conduct empirical research on the market size of life insurance, and establishes the ARIMA model. The market size of life insurance in Anhui Province in the next 5 years is forecasted, which provides a certain reference for the development of China's insurance industry.

2. INDEX SELECTION AND DATA PROCESSING

2.1 SELECTION OF INDICATORS

The size of the life insurance market is subject to various factors, including the GDP per capita, the number of employed people, the aging degree of the population and the price change level in Anhui province. In order to analyze the main factors affecting the size of the life insurance market, this paper takes the size of the life insurance market in Anhui Province as the research object, and takes various factors into account. It is divided into 3 categories: economic factors, population factors and price factors, as shown in Figure 1.

Economic factors have the most direct impact on the size of the life insurance market. With the continuous economic development, the expansion of the insurance industry has become an inevitable result. The development of the economic level of a certain region is directly reflected in the gross national product, per capita disposable income and other indicators and social security expenditure as a representative factor.

The population factor can directly determine the market basis of the market size of life insurance. In the case of continuous population growth and aging, the demand for life insurance is bound to gradually expand. Therefore, the number of people employed and the dependency ratio of the elderly population are selected as indicators to represent the population factor.

Consumption factors can reflect the consumption ability

and willingness of residents, and insurance, as a non daily necessity, is largely affected by the expenditure of daily necessities. In this paper, the year-end balance of residents' savings deposits represents consumption ability, and the consumer price index represents Consumption Willingness, which can well reflect the demand of residents for non necessities. Therefore, price consumption index is selected the number and the year-end balance of savings deposits are representative factors.

Table 3 Pearson correlation analysis

Explanatory variable	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇
Pearson	0.9410	0.9430	0.9560	0.8300	0.8960	0.0429	0.9460
Significance	0.0000	0.0000	0.0000	0.0000	0.0000	0.8657	0.0000

According to table 1, consumer price index X₆. The correlation with the market size of life insurance in Anhui province is not strong, and the remaining GDP X₁, Per capita disposable income X₂, Social security expenditure X₃, Employed population X₄, Elderly dependency ratio X₅, Balance of resident savings deposit at the end of the year X₇ a total of 6 factors.

3. GREY CORRELATION ANALYSIS

3.1 RESEARCH IDEAS

In order to determine the impact of various influencing factors on the market size of life insurance in Anhui province from 2001 to 2018, this paper chooses to establish a grey correlation analysis model to quantitatively determine the size of each influencing factor.

Grey correlation analysis based on the grey theory an analysis method to analyze the correlation between the explanatory variable and the explained variable. The degree of correlation is judged according to the degree of similarity of the change rules of each influencing factor. The higher the degree of similarity, the stronger the

Table 4 Non dimensional data

Year	Y	X ₁	X ₂	X ₃	X ₄	X ₅	X ₇
2001	0	0	0	0	0	0	0
2002	0.0272	0.0102	0.0369	0.0089	0.0142	0.0649	0.0163
2003	0.0720	0.0253	0.0695	0.0179	0.0264	0.0000	0.0364
...							
2016	0.7016	0.7908	0.8245	0.7841	0.9762	0.5844	0.8057
2017	0.9808	0.8883	0.9078	0.8971	0.9926	0.9610	0.8846
2018	1	1	1	1	1	1	1

Calculate the grey correlation coefficient of C₀(k) and C_i(k) respectively:

$$\xi_i = \frac{\min_k \min_i |C_0(k) - C_i(k)| + \rho \max_k \max_i |C_0(k) - C_i(k)|}{|C_0(k) - C_i(k)| + \rho \max_k \max_i |C_0(k) - C_i(k)|} \quad (4)$$

Where ρ is the resolution coefficient, which is taken within (0,1), generally taken as $\rho = 0.5$.

The average value of the correlation coefficient of each influencing factor can obtain the correlation degree of each major influencing factor:

$$r_i = \frac{1}{n} \sum_{k=1}^n \xi_i(k), k = 1, 2, \dots, n \quad (5)$$

3.3 RESULTS ANALYSIS

The data of each influencing factor in the 18 years from ACADEMIC PUBLISHING HOUSE

2.2 DATA PROCESSING

The data in this paper mainly comes from the relevant data of Anhui statistical yearbook and China Insurance statistical yearbook from 2001-2018. In order to build a new indicator system, firstly, the Pearson regression of the market size of life insurance in Anhui province and its various influencing factors is carried out by using SPSS software. The relevant analysis results are shown in Table 1.

correlation. Through this method, the grey correlation degree between the market size of life insurance in Anhui province (Reference Series) and the influencing factors (comparative series) is calculated, and the influence degree of each influencing factor is compared quantitatively.

3.2 MODEL ESTABLISHMENT

Set the reference sequence (parent sequence) as:

$$C_0 = \{Y(k) | k = 1, 2, 3, \dots, n\} \quad (1)$$

Set the comparison sequence (sub sequence) as:

$$C_i = \{X_i(k) | k = 1, 2, 3, \dots, n\}, i = 1, 2, 3, \dots, m \quad (2)$$

Due to the different meanings of various indicator factors and different measurement units, it is impossible to determine the degree of influence of each variable on the model by directly establishing the grey correlation equation on the original data. Therefore, the data needs to be normalized first to make the data more objective and avoid large errors in the results.

The data is uniformly treated as Table 2:

$$\bar{X}_i = \frac{X_i - X_{\min}}{X_{\max} - X_{\min}} \quad (3)$$

2001 to 2018 are non dimensional in accordance with formula (2). After Matlab programming, the data in Table 2 are brought into the following order of correlation from high to low:

According to Table 3, the major factors affecting the market size of life insurance in Anhui province are as follows: economic factors, consumption factors and population factors. The specific influencing factors are as follows: per capita disposable income X₂, Elderly dependency ratio X₅, Social security expenditure X₃, Balance of resident savings at the end of the year X₇, GDP X₁, Employed population X₄

Table 5 Correlation and ranking of influencing factors

Variable	Correlation degree	Rank	First level indicators	Correlation degree	Rank
GDP X_1	0.8165	5			
Per capita disposable income X_2	0.8324	1	Economic factors	0.8239	1
Social security expenditure X_3	0.8228	3			
Employed population X_4	0.7332	6			
Elderly dependency ratio X_5	0.8246	2	Population factors	0.7789	3
Balance of resident savings at the end of the year X_7	0.8191	4	Consumption factors	0.8191	2

The highest correlation degree of economic factors to the market size of life insurance in Anhui province is 0.8239, and the correlation degree of consumption factors is 0.8191, which is similar to economic factors, indicating that economic factors and consumption factors play a decisive role in the market size of life insurance.

From the perspective of various influencing factors, the highest correlation of per capita disposable income is 0.8324, and the lowest correlation is the number of employed populations. The correlation degree of other factors is more than 0.8, which indicates that except for the number of employed populations, the above variables can well explain the size of the life insurance market.

4. PREDICTION BASED ON ARIMA MODEL

4.1 MODEL ESTABLISHMENT

Through the ADF test of the original data, observe whether the time series is stable. If the time series is non-stationary, the first-order difference processing is carried out according to the following formula, and then ADF unit root test is conducted again for the new data.

$$\Delta y_n = y_n - y_{n-1} \quad (6)$$

Table 6 ADF test table of first order difference data

	t-statistic	Prob.*
ADF statistics	-4.833701	0.0027
1% level	-4.057910	
critical value	5% level -3.119910	
10% level	-2.701103	

Table 7 Forecast for the next 5 years

Year	2019	2020	2021	2022	2023
predictive value	635.94	720.87	788.90	867.33	947.15
ULC	549.15	555.70	582.99	624.37	672.95
LCL	722.73	886.05	994.81	1110.29	1221.35

As shown in table 5, UCL is the maximum and LCL is the minimum of the forecast results. The results show that the market size of life insurance in Anhui province will reach 7208.7 billion yuan in 2020 and 9471.5 billion yuan in 2023, showing a stable growth trend.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

In this paper, through the establishment of the grey correlation analysis, the factors affecting the market size of life insurance in Anhui province are explained, and the ARIMA model is used to predict its future development, and the following results are obtained:

The level of economic development will significantly affect the market size of life insurance. Among many

After the first-order difference, the test results are passed as shown in Table 5, thus confirming that the parameter D in ARIMA model is 1. Draw the autocorrelation diagram and partial correlation diagram of the processed time series as shown in Figure 1. Observe and analyze the optional p and q values.

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
		1 0.407	0.407	3.3520	0.067
		2 0.034	-0.158	3.3774	0.185
		3 -0.151	-0.127	3.9060	0.272
		4 -0.384	-0.326	7.5750	0.108
		5 -0.244	0.037	9.1760	0.102
		6 -0.089	-0.050	9.4091	0.152
		7 0.018	-0.006	9.4196	0.224
		8 0.216	0.112	11.090	0.197
		9 0.209	0.026	12.850	0.170
		10 -0.064	-0.240	13.042	0.221
		11 -0.086	0.057	13.435	0.266
		12 -0.141	-0.045	14.717	0.257

Figure 3 Auto correlation and partial auto correlation of sequences

The parameters p and q in the ARIMA model are determined by observing the auto correlation graph and partial correlation graph of the time series, combined with the parameter d confirmed in the previous step, and the model is tested by using AIC, BIC and other criteria, and the optimal model is selected as ARIMA (1,1,1).

4.2 RESULTS ANALYSIS

The selected optimal model is used to predict the future trend of time series.

economic factors, per capita disposable income has the most significant impact on the market size, while the impact of population factor is relatively low, in which the number of employed people has the lowest impact, but still shows a certain positive correlation. This shows that with the improvement of living standards of residents, the awareness of life insurance protection has been improved to a certain extent.

The scale of the life insurance market in Anhui province continues to increase, showing a steady growth trend in the next 5 years. It is expected that the market will reach 94 billion 715 million yuan in 2023, with a large room for growth, which has a certain reference significance for the future development of China's insurance industry.

5.2 RECOMMENDATIONS

Develop regional economy and increase per capita income. Economic development is the foundation of people's livelihood. Economic development improves per capita income and drives the expansion of the market scale of commercial insurance. In order to increase financial income, consumption must vigorously develop the regional economy in Anhui province to improve social security and improve the people's most basic living standard, so that there will be more disposable income to purchase life insurance and thus increase the premium income of life insurance.

Increase financial input and improve social security. Increasing financial investment in social security expenditure, on the one hand, can protect the basic living standards of the people and expand the demand for commercial life insurance, on the other hand, it can also reverse promote economic development and form a good circular effect.

Improve insurance awareness and expand basic demand. The life insurance market in Anhui province still has a lot of room for development. With the improvement of people's living standards, insurance products have become a rigid demand. Only by increasing people's awareness of protection and increasing the emphasis on life insurance, can the people's demand for commercial life insurance be fundamentally improved.

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Research on Photo-Earning Task Pricing Based on Multiple Linear Regression Model

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Abstract: In view of the economic pricing development of popular online labor crowdsourcing platform in China. First of all, based on the real-time statistical data of photo-earning APP, a reasonable pricing scheme of comprehensive evaluation index system was established from the perspective of geographical location, scheduled task quota, task distribution and member distribution. Secondly, it is greedy algorithm, reformulation of equation, price weight model and powermap of Excel that are used for calculation and analysis.

Keywords: Crowdsourcing; Goal programming; Task pricing; Regression model; Photo-earning

1. INTRODUCTION

With the development of society, online crowdsourcing part-time jobs have become a new trend. Traditional market research costs a lot of money and has a long periodicity. To solve these problems, self-service labor crowdsourcing platform "photo-earning" emerges. On the one hand, the users can get the tasks that need to be photographed from the software. For example, they can go to the supermarket to check the shelves of certain products and earn a fee for the task. On the other hand, the enterprise also saves the investigation cost, and effectively guarantees the authenticity of the investigation data. In addition, the investigation period is shortened. But the pricing of the task becomes the core element of whether the task is completed or not. This requires the analysis of pricing rules and the establishment of mathematical models to get a reasonable pricing and the best results of task completion. And then it helps the product inspection to be successful.

Therefore, this paper will build a comprehensive system for the development level of "photo-earning" labor crowdsourcing benefit^[1], and make corresponding research and analysis on the price setting level of part-time crowdsourcing by using pricing analysis and weighted pricing analysis.

- (1) The assumption is that we don't care how easy the task is.
- (2) The assumption is that the task price is either very high or very low.
- (3) The assumption is that there are no instances of members failing to complete tasks after receiving them.
- (4) The assumption is that the usual route of action of members is not taken into account.
- (5) The assumption is that members stay in the same region throughout the statistical period.

2. MULTIPLE REGRESSION MODEL

2.1 Research Idea

Start studying its pricing law, measure the quality of a model depending on its application effect. It can be represented graphically.

2.2 Greedy Algorithm To Solve The Local Optimal

To study its pricing law, using *MATLAB* to convert the data into longitude and latitude graphs, maps and scatter plots. According to the greedy algorithm^[3-5], to find the local optimal solution and to make the scatter plot as shown in Figure 1.

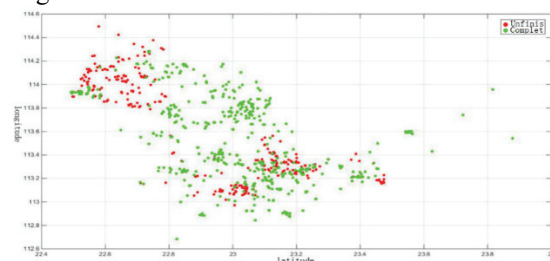


Fig.1 Task profile

Planning the task profile into 9 areas^[6], per 0.38510 degree of longitude is an interval and per 0.53802 degree of latitude is an interval as shown in Figure 2.

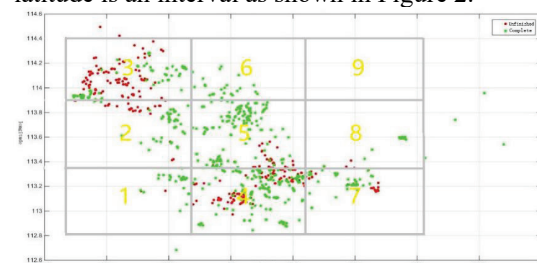


Fig.2 The task profile is equally divided

2.3 Processing Of Multiple Regression Models

Process and apply from the known functions, respectively extracting 3 main data to establish a table as shown in table 1.

Table 1. Area membership, task totals and average pricing table

Partition	The total number of tasks	Membership	The average price
1	29	31	71
2	77	184	69
3	164	564	68
4	283	525	69
5	174	339	68
6	26	94	74
7	55	77	71
8	24	46	71
9	1	0	75

Assuming that the number of members in the independent

variable area is W , the total number of tasks in the area is J , dependent variable is the average pricing in the area M , so the multiple regression equation^[7-9] is

$$M = \theta_1 W + \theta_2 J + \theta$$

The θ_1, θ_2 are dependent variables and θ is random error term. Putting the data in MATLAB and then obtained by multiple regression fitting: $\theta_1 = -0.0048, \theta_2 = -0.0049, \theta = 71.7574$ and degree of fitting^[10] $R^2 = 0.752 > 0.5$, which obtain

$$M = -0.0048W - 0.0049J + 71.7574$$

We can see that the equation has a high correlation with the data. Task pricing law is that as the number of members and the number of tasks increases in a area, the average pricing decreases accordingly.

Making the distribution of members and latitude and longitude into a member distribution map, and comparing it with task distribution map as shown in the figure 3.

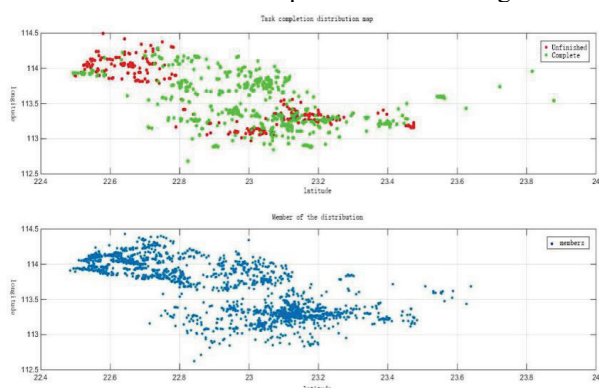


Fig.3 Membership distribution and task comparison chart
Observing the image and find that Where image members are concentrated, task execution rates are lower. Applying the Partition concept in Figure 2 and put the regional task execution rate and Regional Members number in the same table as shown in table 2.

Table 2. Membership number and success rate data table

Partition	The total number of tasks	Membership	The rate success
1	29	31	0.828
2	77	184	0.636
3	164	564	0.371
4	283	525	0.597
5	174	339	0.799
6	26	94	1
7	55	77	0.582
8	24	46	0.833

Assuming the dependent variable is task execution rate is O , and then the multiple regression equation is

$$O = \alpha_1 W + \alpha_2 J + \beta$$

α_1, α_2 are unknown parameters, and β is random error term. Putting the data in Table 2 into MATLAB for fitting obtain $\alpha_1 = -0.001, \alpha_2 = 0.001, \beta = 0.8341$, so the multiple regression equation is

$$O = -0.001W + 0.001J + 0.8341$$

With the increase of the total number of tasks and the decrease of the number of members, the success rate will be higher. But ideally, it is clear that Figure (4) does not accord with this result. Entering the incomplete and completed the latitude and longitude of the incomplete and

completed distribution into powermap of Excel and Compare on a map, Comparing on the map.

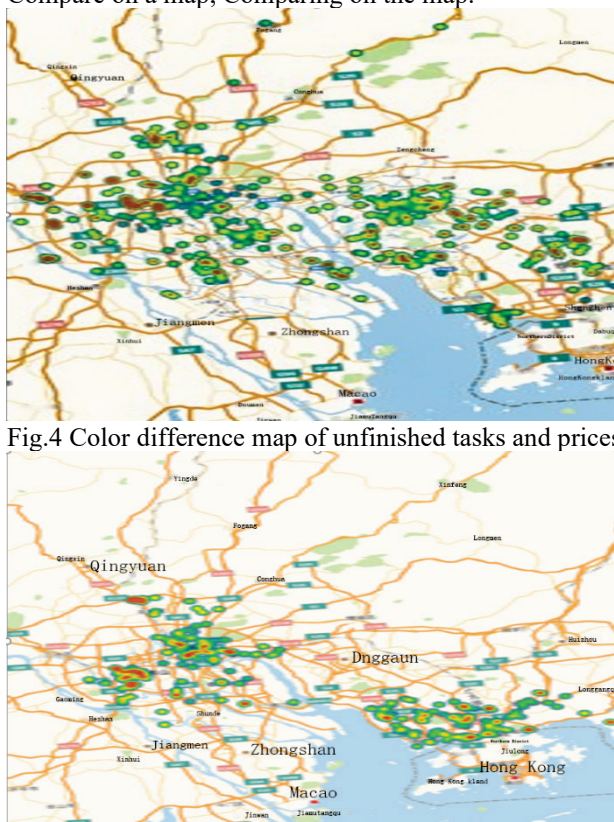


Fig.4 Color difference map of unfinished tasks and prices

Fig.5 Completed task and price chromatic aberration chart
The statistical data are located in the coastal area of Guangdong province, and the result is obtained by re-fitting:

$$O = 0.0020W - 0.0046J + 0.8097$$

Design projects in real data into new task pricing scheme, and compared with the original scheme to obtain Table 3.

Table 3. Partitioning factor pairs for comparison

Partition	The total number of tasks	Membership	Members limit	The average price
1	29	31	370	71
2	77	184	596	69
4	283	525	3742	69
5	174	339	3060	68
6	26	94	554	74
7	55	77	737	71
8	24	46	427	71

Assuming that the average pricing is the dependent variable X , the independent variable is the total number of tasks S , membership number is P , total membership Limit is Q , which obtain the Multiple regression equation

$$X = a_1 S + a_2 P + a_3 Q + e$$

a_1, a_2, a_3 are unknown parameters of independent variable, e is the error variable, putting the data in Table 1 into MATLAB to fitting to get formula

$$X = -0.0312S + 0.0075P + 0.0002Q + 71.6544$$

3. GREEDY ALGORITHM MODEL

3.1 RESEARCH IDEA

The release of the task package will be more demanding

on the member's reputation value and prior limitation. Packaging 10 tasks, members below 10 will not be able to accept the package task, and new variables will appear that affect the execution rate.

3.2 THE SOLUTION OF GREEDY ALGORITHM

Greedy algorithm divided the total region into the same nine regions^[14], and figured out the ratio of the number of members in each region with a predetermined task quota of more than 10 and more than quota 2 to the total number of members in the region, and got Table 4:

Table 4. The ratio of the number of members to the total number of members in the region

Partition number	The total number of members	Above quota 10	Quota and above	2 Quota above (%)	Quota 2 above (%)
1	31	12	28	39	90
2	184	12	119	7	65
3	564	60	388	11	69
4	525	92	378	18	72
5	340	63	253	19	74
6	94	10	80	11	85
7	77	21	66	27	86
8	46	16	36	35	78

Counting the number of members and the total number of tasks in each region, and got Table 5:

Table 5. List of membership and task totals

Partition	Membership	The total number of tasks
1	31	29
2	184	77
3	564	164
4	525	283
5	339	174
6	94	26
7	77	55
8	46	24

The linear regression equations are listed according to Table 5:

$$J = \omega W + \varepsilon$$

The ω and ε are unknown parameters, the data processed by MATLAB can be obtained as follows:

$$J = 0.3984W + 12.1976$$

Calculating the goodness - of - fit^[10]: $R^2=0.909$. The ratio of the number of members with a limit of more than 2 to the total number of members in the region is used as the weight^[10-12] of the number of packaged tasks in each region, and combined the number of members in each region to made into table 6:

Table 6. Membership number and weight relationship table

Partition	Membership	The weight
1	31	0.9
2	184	0.65
3	564	0.69
4	525	0.72
5	340	0.74
6	94	0.85
7	77	0.86
8	46	0.78

The linear regression fitting of the data in Table 6 is as follows:

$$W = b_1 T + c$$

The T is the weight value of the number of tasks packed in each region, and the $b_1 c$ is the unknown parameter value. The data in the table are fitted with MATLAB to get:

$$W = -1649.457 + 1508.886$$

4. WEIGHT MODEL

4.1 RESEARCH IDEA

If the multiple regression pricing model is added to the Weight Model of Greedy Algorithm, the correct pricing solution will emerge.

4.2 THE SOLUTION OF WEIGHT MODEL

List the membership whose quota is greater than 2 in each region. Compared with the total number of membership in the region, the membership with the quota of 1 cannot book the packing task, so the data weight is obtained. Figure out the number of packaged published tasks from the number of tasks in each region, and then appropriately reduce the price of packaged tasks, and appropriately increase the price of unpackaged tasks. The reduced and increased prices can be obtained by taking the weighting of each region into the simultaneous equations 1, in which the weighting of each region can be inserted. Based on the analysis of multi-objective programming, the simultaneous equations (12) is obtained

$$\begin{cases} J = 0.3984W + 12.1976 \\ W = -1649.457 + 1508.886 \end{cases} \quad (12)$$

By analyzing the membership data table of network data, it is found that the membership with quota of 1 account for 35% of the total number of members. The package publishing task will reduce the interest of the members with low quota on the platform and lead to the loss of the platform membership.

5. SYNTHESIS OF WEIGHT MODEL AND GREEDY ALGORITHM

5.1 RESEARCH IDEA

Work out task pricing solution for new projects. We imported the online data into the map through Excel Power Map for observation, and found that except for a few tasks scattered, the rest tasks were concentrated in Haizhu District and Tianhe District of Guangzhou, Nanshan District and Longgang District of Shenzhen.

5.2 WEIGHT MODEL AND GREEDY ALGORITHM

According to the regression equation analysis, this text uses the Weight Model analysis and Greedy Algorithm to solve the local optimal solution. It is assumed that there are three factors: regional economy Z , regional membership number P and regional task number S , which will affect the quotation task price. As shown in:

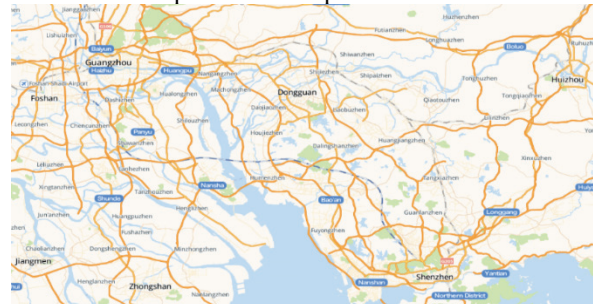


Fig.6 The task distribution map in Annex III

According to the National Bureau of Statistics of the People's Republic of China, the recent economic

conditions^[15] and traffic conditions of each region are shown in Table 7. Through the analysis of data 2 and 3, the number of membership and tasks in these five regions Table 7. Statistical table of regional variables

Partition	Number of jobs	Membership	District GDP (100 million yuan)	Economic level weight
Baiyun district	514	93	1640	0.12
Zhuhai district	368	92	1550	0.12
Longgang district	287	55	2636	0.20
Nanshan district	239	50	3714	0.28
The tianhe district	432	97	3801	0.28
The sum of the	1840	387	13341	1.00

Through 5.1, the incomplete multiple regression equation of task price (2) can be obtained, and the initial pricing table 8 can be obtained: Table 8. The initial price

Partition	The initial price
Baiyun district	68.79
Zhuhai district	69.51
Longgang district	70.09
Nanshan district	70.35
The tianhe district	69.18

Table 9. Reasonable pricing

Partition	The initial price
Baiyun district	59.99
Zhuhai district	60.71
Longgang district	62.09
Nanshan district	63.15
The tianhe district	61.98

The economic level weight t in Table 7 is added to the initial pricing m to obtain the reasonable pricing M_1 , as shown in Table 9.

$$m - 10 + 10 * t = M_1$$

6. CONCLUSION

In this paper, the statistical regression model, objective programming model and weight model are used for calculation and analysis, and a large number of data are used for processing. In this way, the results obtained are relatively reliable. The conclusions are as follows: (1) Crowdsourcing is developing very fast in the coastal areas of Guangdong, but very slowly in the central and western regions. Therefore, we can vigorously impel it in the central and western regions to promote the development of part-time Internet crowdsourcing tasks, and improve people's livelihood. (2) Pricing rationality solves a lot of real problems, so as to help members better complete tasks, thereby promoting the rapid development of the Internet economy. (3) It is necessary to dig into the local development advantages of Guangdong coastal areas and further strengthen external economic communication and cooperation. Besides, we will increase fiscal input to strengthen the economy. At the same time, we will optimize the Internet infrastructure structure in the eastern and western regions and actively promote the

(Baiyun District, Haizhu District, Longgang District, Nanshan District, Tianhe District) can be counted.

development of the Internet system.

ACKNOWLEDGEMENT

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Research on The Decision and Arrangement of Desert Crossing Based on Dynamic Programming

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Abstract: A playing method which is aimed at the walkthrough of cross the dessert. First of all, the game is based on knowing all the weather conditions in advance, establishing the upper limit of load, initial capital, basic income, basic consumption, time and other conditional indicators, and then build dynamic programming model which is related to shortest path method. Moreover, given the weather conditions of the day to make dynamic choice. It can use Markov prediction model to forecast the weather and work out optimal revenue strategy. Lastly, use game theory to analyze, renew your strategy sets, adjust your strategy According to confirmed analysis result, putting forward reasonable and effective conclusion.

Keywords: Cross the Dessert; Dynamic Programming; Shortest Path; Markov Prediction; Game Theory

1. THE ESTABLISHING AND SOLVING OF PLAYER DECISION- MAKING MODEL

With the development of the society, game have become an indispensable part of entertainment in people's life. Now there is a game of dessert, players have only one map, use the initial amount to buy certain materials, and walk in the desert from the beginning to the end. There are village supply depot, mine and different climates on the map. The way of the game is as follows: try to give the best revenue plan for the player under the known weather of each day, or the player only knows the weather of that day and decides the action plan for that day, or under the condition of having n players, the resource consumption is doubled as the basic energy; If n gamers dig a mine, one consumes three times as much resources, and if they buy resources in the same village at the same time, the unit price increases four times. The rest of the basics are the same as in the single-player game. This makes the research analysis.

In the process of solving the game, players will face different natural conditions or objective conditions in the game state, so it is necessary to make corresponding decisions on the stage and state of players, and use dynamic programming multiple decisions to study the optimal solution of the game, so as to enable players to better survive in the game and surpass other players.

Firstly, to solve routing problems we consider using Dijkstra algorithm to solve the shortest path problem, and then consider the two routes with and without

revenue. Then, combined with all the conditions to constrain our results, especially for the unknown weather, we can adopt the Markov prediction model to predict the weather of tomorrow, and use the strategy theory to compete with the players playing the game together to plan the optimal route plan.

1.1 SHORTEST PATH AND DYNAMIC PROGRAMMING MODEL

1.1.1 RESEARCH IDEA

During the process, game players have always played around the survival and profit, calculate the shortest distance to save players supplies, consider whether there is income or not, make a balance between weather conditions and the benefit of arriving at the mine, analyze the stage, state, decision, evaluation phase and indicator function under the dynamic programming[1-2], therefore, get the optimal route.

1.1.2 THE SHORTEST PATH OF DIJKSTRA

Objective function:

$$Y_{\max} = 10000 - y_1 - y_2 + y_3 + y_4 \quad (1)$$

$$S.J \begin{cases} 3W_1 + 2F_1 \leq 1200 \\ 5W_1 + 10F_1 + 10W_2 + 20F_2 \leq 10000 + y_3 \\ \sum_{j=0}^k w \leq W \\ \sum_{j=0}^k f \leq F \end{cases} \quad (2)$$

Explanation of nouns: W refers to the total tanks of water, F refers to the total tanks of food, W_1 and F_1 are the initial purchases, W_2 and F_2 are the second purchases, y_1 and y_2 respectively represent the cost of first and second purchases, y_3 represent the money earned from mine, and y_4 represent the money gained from the final sale of the food.

The factors that affect players making decisions: level clear, weather, supplies, maximum of profit, and finally, to get the maximum of objective function.

The fundamental thinking of Dijkstra's Algorithm[3-5]:

(1) At first, setting an aggregate $S = \{V_0\}$, and another aggregate is $V - S = \{\text{another vertex}\}$, the distance value corresponding to the vertex in the $V - S$ is (V_0, V_i) , the $D(V_0, V_i)$ is the weight value on the arc, and if not, the $D(V_0, V_i)$ is the ∞ (set a large integer).

(2) Selecting a vertex which exists the incident edge connected with the vertex V_{\min} in the S from $V - S$, and

add it to the S .

(3)Revising that to go from V to any vertex in aggregate $V - S$.

(4)repeating the above steps (2),(3)about $n - 1$ times until S contains all of the vertexes, that is $V_{\min} = V_i$.

In the first level, the requirements of the game are to assume that there is only one player, and the weather conditions of each day are known in advance throughout the game period, so please try to give the optimal strategy of the player under general circumstances. The level map is shown in the figure below:

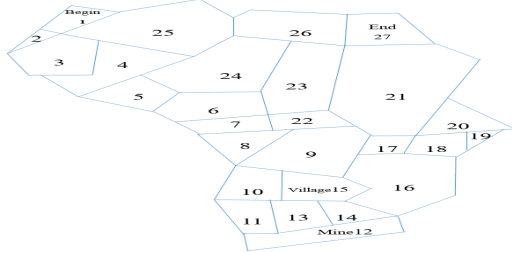


Fig.1 First level map

After calculating, it takes at least 8 days to reach the mine from the starting point. Considering the weather conditions, it takes 10 days or 11 days to reach the mine. The routine is shown in Fig.2 :

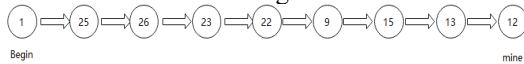


Fig.2 Shortest path to mine

Function:

$$y_1 \max = 5W + 10F$$

$$s.t. \begin{cases} W \leq 228 \\ F \leq 220 \\ 3W + 2F \leq 1200 \end{cases}$$

Finally get this : $Y_{\max} = 10000 - y_1 - y_2 + y_3$

In the second level, the game requirements are the same as the first level, the level map is shown in Fig.3:

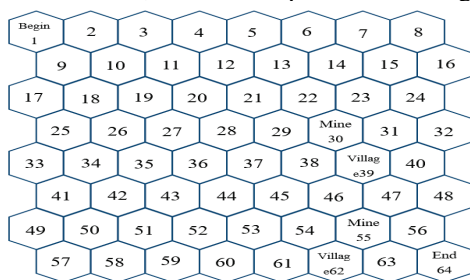


Fig.3 Second level map.

The best Revenue route:

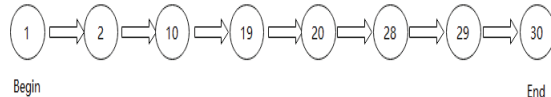


Fig.4 Shortest path to mine

$$Y_{\max} = 10000 - y_1 - y_2 + y_3$$

Function:

$$\begin{cases} W_1 + W_2 = 124 + 3 \sum_{j=10}^{10+N} w_j + 2 \sum_{j=10+N}^{14+N} w_j \\ F_1 + F_2 = 110 + 3 \sum_{j=10}^{10+N} f_j + 2 \sum_{j=10+N}^{14+N} f_j \\ 3W_1 + 2F_1 \leq 1200 \\ y_1 + y_2 \leq 10000 + y_3 \end{cases} \quad (6)$$

Explanation of nouns: w_j represents the total number of water tanks consumed on the j day, f_j represents the total number of food tanks consumed on the j day.

2. MARKOV FORECASTING MODEL

2.1 RESEARCH ROUTE

The weather here is unknown, and we only get the weather condition of the day. If we want to forecast the weather in tomorrow with the known weather conditions of the day, what we should consider first is the Markov Forecasting Model, and forecast through the previous data collection.

2.2 ESTABLISHMENT AND SOLVATION ABOUT MODEL

For the third level, the game requires that there is only one player, and the player only knows the weather conditions of the day, so he can decide the action plan of the day according to this, and try to give the best strategy for the player under general conditions. The level map is as follows:

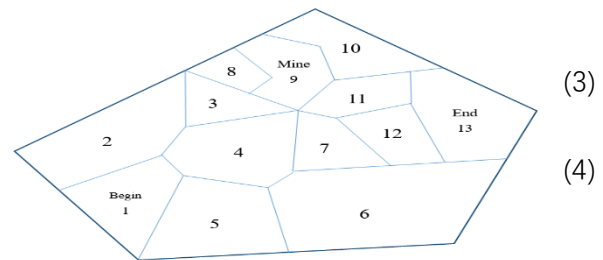


Fig.5 Third level map

According to the shortest distance, as shown in the illustration:

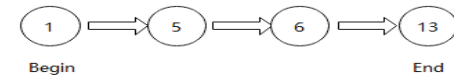


Fig.6 Start to finish

The consumption resources in three-days walk:

$$\begin{cases} \sum_{j=1}^3 w_j \\ \sum_{j=1}^3 f_j \end{cases}$$

Remaining cost: $y = 10000 - y_1$

It can be concluded that working in the mine for 6 days, from the perspective of income, from the starting point to the mine and then to the end, the player cannot earn back the cost in a limited period of time. Therefore, no matter what the weather is, we should choose directly from the beginning to the end, which is the most cost-effective scheme.

For level 4, the game requirements are consistent with

level 3. The level map is as follows:

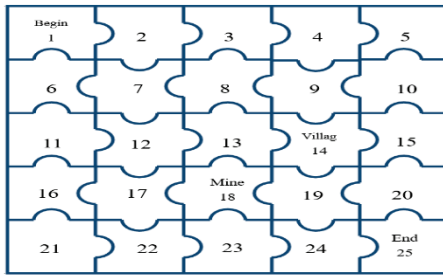


Fig.7 Fourth level map

In order to forecast the weather probability of tomorrow, Markov prediction method[6-8] can be used to predict the probability of weather in tomorrow, $\pi_j(k)$ indicates that the event is known condition when be in the initial state ($K = 0$), and after K state transitions, the probability of the event in the state E_j at the K moment (period) is:

$$\sum_{j=1}^N \pi_j(k) = 1$$

To start with the initial state, the process of reaching state E_j after K state transitions can be regarded as the process of first reaching state after K state transition, and then reaching state E_j after E_i experiences one state transition.

According to the no aftereffect and Bayes[9] conditional probability formula of Markov Process, it is:

$$\pi_j(k) = \sum_{i=1}^n \pi_i(k-1)P_{ij} \quad (j=1,2,\dots,n)$$

If record the row vector $\pi(k) = [\pi_1(k), \pi_2(k), \dots, \pi_n(k)]$, and then according to formula (8), the recurrence formula for calculating the state probability can be obtained step by step:

$$\begin{cases} \pi(1) = \pi(0)P \\ \pi(2) = \pi(1)P = \pi(0)P^2 \\ \vdots \\ \pi(k) = \pi(k-1)P = \pi(0)P^k \end{cases}$$

In the formula(9), $\pi(0) = [\pi_1(0), \pi_2(0), \dots, \pi_n(0)]$ is the initial state probability vector.

State transition is of probability, and there are only four possibilities about weather conditions: sunny to sunny, sunny to high temperature, sunny to sandstorm, high temperature to high temperature, high temperature to sandstorm, sandstorm to fine, sandstorm to high temperature and sandstorm to sandstorm. We can simulate the weather, from sunny to sunny twice, from sunny to high temperature for 5 times, from sunny to sandstorm for 2 times, from high temperature to sunny for 5 times, from high temperature to high temperature for 6 times, from high temperature to sandstorm for 3 times, from sandstorm to sunny for 2 times, from sandstorm to high temperature for 3 times, and from sandstorm to sandstorm once. Therefore, we can record sunny as E_1 high temperature as E_2 , sandstorm as E_3 . So the matrix is following:

$$P = \begin{bmatrix} 0.22 & 0.56 & 0.22 \\ 0.36 & 0.43 & 0.21 \\ 0.33 & 0.50 & 0.17 \end{bmatrix}$$

3.GAME THEORY MODEL ESTABLISHMENT

3.1RESEARCH IDEAS

In a "N" human game, people need to combine old and new rules to handle the multiplayer solution. Different routes took by different players, as well as all kinds of weather, stay time, mining and other issues, which need to be comprehensively discussed. It can be analyzed according to the single player game method first, and then combined with the available two-person scheme to discuss.

3.2THE ESTABLISHMENT AND SOLUTION OF MODEL

In the fifth level of the game that requiring in the case of "N" players, assuming that all the weather conditions of each day are known in advance during the whole game period, the action plan of each player should be determined on the "0" day and cannot be changed hereafter. Trying to give general strategies that the player should take in normal circumstances. The level map is as follows:

3.2.1ROUTE: BEGIN TO END

The shortest route from the beginning to the end is only three days. Taking all factors into consideration, and choose the best route for customs clearance as soon as possible.

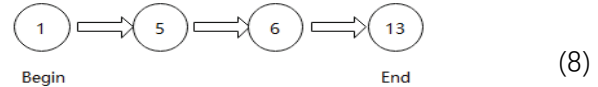


Fig.9 Start to finish

The scheme presentation and analysis under different strategies need to be customized by the players, then play to choose the route they want to pass.

3.2.2ESTABLISHMENT OF GAME MODEL IN THE SIXTH LEVEL

There are at least two players on the same map in the game requirement. Knowing the weather conditions of each day, the remaining players' action plan and the amount of remaining resources after the action was finished on that day in advance. Then, players determine their action plan for the next day. By establishing a game theory model [10-11]. Setting I to represent player in the game, there is $I = \{1, 2, 3\}$, S_i represents player strategy set, including resources, economy, weather conditions, etc. There is a strategy set in S_i

$$S = (s_1, s_2, s_3)$$

I is 1, represents sunny days; I is 2, represents high temperature; I is 3, represents windstorm. In addition, another route should be recorded. The set of S in the whole situation can be explained by the Cartesian product $\{1, 2, 3\}$ of the strategy sets of all players.

$$S = S_1 \times S_2 \times S_3$$

For any situation, $s \in S$ player i , can win a $H_i(s)$, thus obtaining a vector win function.

$$H(s) = (H_1(s), H_2(s), H_3(s))$$

3.3 SOLUTION OF MODEL

Making a perfect strategy analysis [14 - 15] and the design scheme. In the set of a computer, it doesn't seem to be found immediately by participants, which needs to be defined possibly from different factors. There are four basic plans in this direction. The first one is from the starting point to the end directly. The second one is from the starting point to the village to buy new goods first, then set out to mine, and finally to the finish line. Or from the beginning to the mine, then to the village, and finally to the end. Or from the beginning to the mine, and then back to the beginning, and then start again to the end. The player's mental tactic is sitting and observing the chance of plan, and may also exists a condition that the player anticipating bad weather and not acting. When purchasing materials in villages and working in mines, players' strategies will be changed accordingly. These strategies are made to survive longer or earn more money from mines. Finally, players only need to work out the vector win function to solve this problem.

4. CONCLUSION

In this paper, according to the dynamic programming model, shortest path method, Markov prediction, game theory for calculation and analysis, using a large number of data processing, so that the results are relatively reliable. In the analysis of game theory model, the important strategy sets are mainly considered, and some insignificant ones can be considered to be eliminated. Game theory can handle any behavior with competitive or antagonistic quality well. So when we play a difficult game across the desert, we can use these methods to crack and get the best solution.

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Research on the Optimal Decision of Airport Taxi Based on Queuing Theory

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Abstract: Aiming at the maximization of the passenger homepage and the best pick-up point for the taxi airport to and from the airport, the queuing theory algorithm is used to construct a queuing theory algorithm model. Based on the loss of economic benefits, the queuing theory simulation is used to obtain data based on Shanghai Airport. The actual situation of Shanghai Pudong Airport calculates the decision-making choices of taxi drivers at Shanghai Pudong Airport. Comprehensive use of EXCEL, MATLAB and other software programming solutions, it is concluded that Shanghai Pudong Airport taxi drivers have the highest profit when they adopt the optimal decision.

Keywords: Decision Model; Queuing Theory; Queuing Theory Simulation; MATLAB; Priority

1. INTRODUCTION

After the reform and opening, my country's economic construction has gained great achievements. The economic development of western developed countries in the past 100 years is being caught up by the rapid development of my country in more than ten years[1]. Economic growth and the improvement of residents' consumption levels have brought about a violent increase in the demand for air passenger transportation. Popularization and common air travel methods have brought about an increase in airport passenger throughput. Airports are used to park and provide aircraft take-off venues, occupying a large area. It has higher requirements on the surrounding environment, so the airport is generally located in the suburbs[2]. As a passenger-cargo transfer center undertaking multiple modes of transportation, the airport has a large passenger flow. In order to ensure the safe and efficient operation of the airport, it is necessary to use various means of transportation to evacuate passengers as soon as possible[3]. Most passengers go to the city or surrounding areas after getting off the plane. The convenience, speed and comfort of taxis make them the main means of transportation at the airport. Under this circumstance, a reasonable mathematical model is established. Taxi drivers provide a passenger decision-making model, and rationally arrange "boarding points" to maximize the efficiency of the ride and maximize the overall benefits of airport transportation.

2. DATA SOURCES AND MODEL ASSUMPTIONS

The data comes from Question C of the 2019 National College Students Mathematical Contest in Modeling. In order to facilitate modeling and research, the following assumptions are proposed: (1) Assume that the vehicle is running without failure; (2) Assume that the number of

taxis does not change within a certain period of time; (3) Assume the purpose of the airport to the city (or surrounding), there are no traffic accidents on the road; (4) Assuming that there are no regular customers calling, etc., modern communication that non-unfamiliar guests can carry out; (5) Assuming that there is no change in the taxi policy for a certain period of time, and there is no major business model change.

3. MODELING ANALYSIS OF TAXI DRIVER'S CHOICE DECISION

3.1 RESEARCH IDEAS

Under normal circumstances, taxi drivers are faced with the two options of vacating the passengers and returning to the city to solicit passengers. Besides, they are going to the arrival area to wait for the passengers to return to the city. If a taxi driver wants to maximize the revenue of passengers, he must make a reasonable decision among two choices. The decision is generally affected by factors such as the base price of the airport lease, the number of passengers at the airport, the distance of the passenger's destination, the intensity of urban traffic in the same period, and the intensity of airport taxi competition. According to the queuing theory, the corresponding mathematical model of the mathematical model is established. The corresponding selection strategy for maximizing the driver's income is shown in Figure 1.

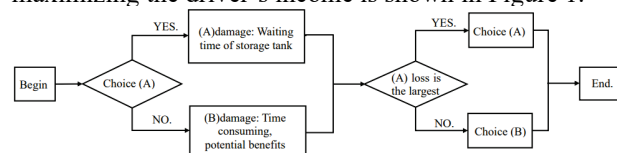


Figure 1 Decision-making selection flowchart

3.2 RESEARCH METHOD

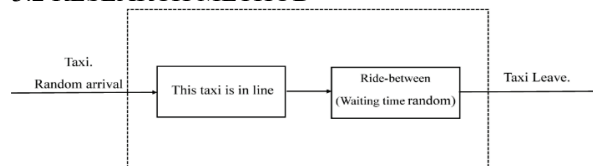


Figure 2 Taxi Queuing Model

Decision A: Go to the passenger arrival area and wait in line for the passenger to return to the city. Decision B: directly return to the urban area to solicit customers. The information that taxi drivers wait for passengers to board in the "car storage pool" conforms to the rules of queuing theory, as shown in Figure 2. The dotted line in Figure 2 contains the taxi queuing system. Each taxi driver arrives at the airport randomly from any location in the city, and waits in line at the designated taxi "car storage pool" at the airport. They cannot leave the queuing system until

passengers receive the service. It neither wastes resources nor satisfies passengers and drivers.

$\rho_s = \frac{\rho}{s} = \frac{\lambda}{s\mu}$ when $\rho_s < 1$, the queue can be dissipated and will not grow longer. Average queue length of taxi queue model:

$$L_q = L_s - \bar{c} = \frac{\rho_c}{(1-\rho_c)^2} p_c \quad (1)$$

Average pair length:

$$L_s = L_q + \rho = \frac{\rho_c}{(1-\rho_c)^2} p_c + \rho \quad (2)$$

The average stay time of passengers in the system, using the Little formula in queuing theory:

$$W_s = \frac{L_s}{\lambda} \quad (3)$$

Average waiting time of passengers in the system: (system operation indicator)

$$W_q = W_s - \frac{1}{\mu} \quad (4)$$

Taking into account the changing law of the number of passengers at the airport and the income of taxi drivers, the number of passengers is considered as the peak period of the number of passengers. The starting price of taxis at the airport is higher than other places. Therefore, based on these two premises, the following two hypotheses are proposed.

Hypothesis 1: The time cost and economic loss of strategy A are greater than strategy B. That is, strategy B does not mean that the taxi is empty when returning to the urban area during peak hours. At this time, the B strategy is adopted.

Hypothesis 2: The time cost and economic loss of strategy A are less than strategy B. That is, under strategy B, taxis in the low peak period are empty when they return to the urban area to solicit passengers. At this time, the A strategy is adopted.

3.3 RESULTS ANALYSIS

Loadable: Two strategies are given in the question, namely Decision A and Decision B. Under Decision B, if the taxi returns to the urban area when it is empty, it is not empty. That is, it is carrying passengers. At this time, compared with the taxi waiting in the airport "car storage pool", the time, cost and potential passengers will all disappear. That is, the time cost is much greater than the taxi waiting in the airport "car storage pool". So in terms of time cost, decision B should be given when choosing a driver. On the other hand, in terms of economic benefits, taxis waiting in the "car storage pool" of the airport will also incur greater losses. Therefore, decision B should also be given.

In other words, when the taxi empties and returns to the city to solicit passengers, it is in the state of carrying passengers. Regardless of the time cost and economic benefits of taxis in the airport "car pool", their losses are relatively large. The choice given to the taxi driver at this time is Decision B.

No-load: When the driver chooses the Decision B, he will face the loss of the cost of the load and the loss of the profit of potential customers. If only consider B decision on this. The loss must be the largest and the model is rough. Therefore, when the driver chooses B decision, the loss of

B decision should be compared with the time cost of Decision A to enter the "car storage pool". The airport "car storage pool" is mainly direct and weekly transformation[4]. Therefore, the air-load cost loss and potential customer revenue loss faced by decision B should be compared with the queuing time cost loss and passenger-carrying revenue of solution A[5].

When the "car storage pool" of the airport is of direct access type, the vehicles are waiting in line for passengers to get on the bus. At this time, the vehicles will have a high probability of causing congestion and the time cost of taxi drivers will increase.

When the "car storage pool" of the airport is converted weekly[6], there are multiple passenger waiting platforms. At this time, taxi drivers can fill the vacant platforms randomly, which reduces the time cost and improves passenger carrying efficiency. However, compared with decision A, this strategy still has a period of dead time. That is, the time cost of this strategy is greater than that of Decision A.

In summary, no matter which way the taxi runs in the "car storage pool" of the airport under no-load conditions, its time cost will increase greatly, and its economic benefits will be much smaller than Decision A. In this regard, the driver's selection strategy is Decision A.

4. RESEARCH ON OPTIMAL SELECTION STRATEGY OF SHANGHAI AIRPORT TAXI DRIVERS BASED ON QUEUING THEORY MODEL

4.1 RESEARCH IDEAS

Taking Shanghai Airport as an example, substituting the checked data into the queuing theory model[7]. After calculation, the detention time of passengers and the waiting time of taxis are obtained respectively [8]. Then analyze the results. If the taxi waits for a long time, you can consider returning to the airport "car pool" to wait for passengers to board. At this time, Decision A is more reasonable. On the contrary, if the taxi waits for a short time, the taxi driver should return to the urban area to solicit passengers after emptying passengers. At this time, Decision B is more reasonable[9].

4.2 RESEARCH METHODS

(1) Theoretical Preparation

The actual month-on-month and year-on-year growth of the number of aircraft takeoffs and landings, passenger throughput, and cargo and mail throughput at Shanghai Airport[9], clean the data to filter out the throughput and year-on-year growth rate of Shanghai passengers. As shown in Figure 3:

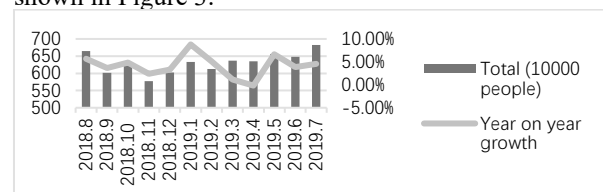


Figure 3 Passenger throughput of Shanghai Airport

(2) Model Establishment

From the data after cleaning, the queuing theory model can be obtained. As shown in Figure 4.

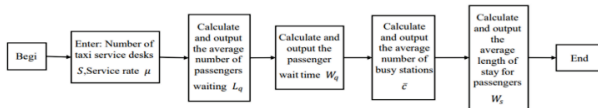


Figure 4 Queuing theory multi-channel waiting queue model algorithm flow chart

Average queue length:

$$L_q = L_s - \bar{c} = \frac{\rho_c}{(1 - \rho_c)^2} p_c$$

$$= 1280 - 1154 = 126$$
(5)

Average pair length:

$$L_s = L_q + \rho$$

$$= \frac{\rho_c}{(1 - \rho_c)^2} p_c + \rho$$

$$= 1154 + 126 = 1280$$
(6)

Average length of stay of passengers in the system.

For the service system for multiple taxis at the airport, Little Formula is still used.

$$W_s = \frac{L_s}{\lambda} = \frac{1280}{60} = 21.3 \text{ min}$$
(7)

Average waiting time of passengers in system operation indicators.

$$W_q = W_s - \frac{1}{\mu} = 21.3 - \frac{1}{0.75} = 20 \text{ min}$$
(8)

4.3 ANALYSIS OF RESULTS

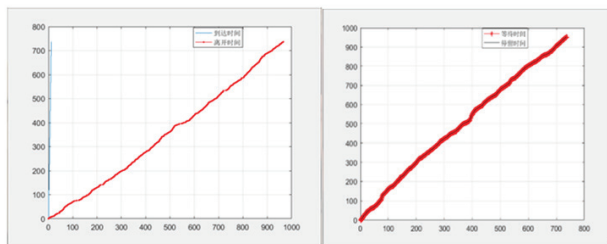


Figure 5 MATLAB Simulation Diagram

The model can get a long waiting time for taxis. As shown in Figure 5, Drivers can consider returning to the airport “car pool” to wait for passengers to board. Decision A is more reasonable and highly dependent on related factors [10-11].

5. CONCLUSION

Decisions are made through time cost and economic benefits. The time is calculated using the knowledge of queuing theory. The simulation of queuing theory is combined to analyze the time cost of taxis. On the basis of time cost, considering the actual difference in starting prices during the morning and evening peak periods. It analyzes the loss of air-carrying costs and the loss of potential customers' benefits, comparing them with the cost of queuing time, and the passenger benefits. Then it gives the priority of the plan. Finally, given these two decisions, which method is more optimal to arrange the “boarding point” to maximize the economic benefits and maximize the revenue of airport transportation taxis. The optimal arrangement of the “boarding point” is based on the comprehensive identification, accuracy, system, accuracy, and science of the problem information for

precise management.

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Structural Design and Experimental Analysis of Carbon-free Trolley Based on Conjugate Double Cam Mechanism

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Abstract: Carbon-free trolley is a mechanical trolley with continuous obstacle avoidance function, which takes gravity potential energy as its sole power source and can realize the true concept of carbon-free. Exploring how to optimize the design of carbon-free trolley to achieve the established tracking and obstacle avoidance function is an important project in the comprehensive ability competition of engineering training for Chinese college students, and can also provide a theoretical basis for the design of low-carbon or carbon-free devices in the future. Considering the design requirements, running track and driving stability, a self-propelled trolley based on double conjugate cam structure is designed and manufactured in this paper, which is mainly composed of motive mechanism, frame, transmission mechanism, steering mechanism and fine adjustment mechanism, and can realize the “S-ring” track running ability. The motion simulation module of SolidWorks and 3D printing technology are used to complete the manufacture of the carbon-free trolley, and the running status and design rationality of the carbon-free trolley are verified through the trajectory debugging and positioning debugging.

Keywords: Carbon-Free; Trolley; Double Conjugate Cam; S-Ring; 3D Printing

1. INTRODUCTION

In recent years, with the rapid development of road traffic, a large number of urban mobile vehicles have increased, and the carbon emissions of vehicles have gradually increased, which has a negative impact on urban air quality and global climate [1]. With the improvement of people's awareness of energy conservation and environmental protection, the concept of low-carbon or even carbon-free has been paid attention to by people and popularized and utilized in the fields of mechanical design and vehicle engineering.

Carbon-free trolley is a mechanical trolley with continuous obstacle avoidance function, which takes gravity potential energy as its sole power source and can realize the true concept of carbon-free. Although the open-loop equipment such as carbon-free trolley is difficult to be directly applied in practical applications, when it is combined with various circuit systems to form a closed-loop mechatronics system, it can meet the application requirements to a certain extent [2-4]. More importantly, its structural design ideas can provide theoretical basis for the subsequent design of low-carbon or carbon-free

devices.

At present, exploring how to optimize the design of carbon-free trolley to achieve the established tracking and obstacle avoidance function is an important project in the comprehensive ability competition of engineering training for college students [5-7]. Hubei University of Arts and Science optimized the design of the carbon-free trolley with S-shaped trajectory based on Matlab, and the experiments show that the designed carbon-free trolley can maximize the energy utilization, optimize the trajectory and minimize the time cost [8]. Nanjing University of Science and Technology designed a kind of carbon-free trolley which can run on 8-shaped track, and established the dynamic simulation model of the whole trolley by ADAMS software. However, so far, the research work on carbon-free trolleys mainly focuses on the research design and motion simulation of local mechanisms, but lacks the research on the design, simulation and manufacturing of whole trolley mechanisms.

Therefore, this paper designs a carbon-free trolley based on the double conjugate cam structure, and uses the motion simulation module of SolidWorks and 3D printing technology to complete the car manufacturing. Finally, the running status of the carbon-free trolley is verified by experiments.

2. OVERALL STRUCTURAL DESIGN

2.1 Design Requirements

It is required to design and manufacture a self-propelled trolley with direction control function. The power source of the trolley comes from the gravitational potential energy provided by 1Kg standard weight (50×65 mm, made of carbon steel). The descending height of the weight is 400±2mm, and the direction is controlled by a reasonable design mechanism to walk out of the S-shaped track as shown in Figure 1.

The “S-ring” track is a closed ring track composed of straight and circular segments. 12 barrier piles are placed along the centre line of the track. The barrier piles are plastic round bars with a diameter of 20mm and a height of 200 mm. The trolley needs to bypass the barrier piles on the track in turn in an “S-ring” route on the ring track, and move forward automatically until it stops. The track is laid horizontally, with a straight section width of 1200 mm, and a partition wall is arranged between the straight sections of the track on both sides.

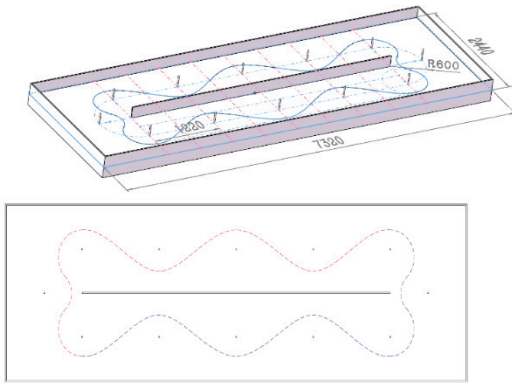


Figure 1 S-shaped track

2.2 Path Planning

Based on the symmetry of the track path, when designing the obstacle avoidance function of the carbon-free trolley, we can first consider the running of the trolley on the "MNOPQ" half-cycle track path, and then running of the whole track. Among them, the MNOPQ half-cycle track can be divided into two parts: MNO section and OPQ section, as shown in Figure 1.

It can be seen from Figure 1 that the ideal running track of MNO section is a smooth sinusoidal curve, which is not easy to produce rigid impact in the movement turning. Therefore, the ideal running track of the trolley in MNO section can be designed according to the sinusoidal curve of two periods.

The trolley in OPQ section usually has three running paths,

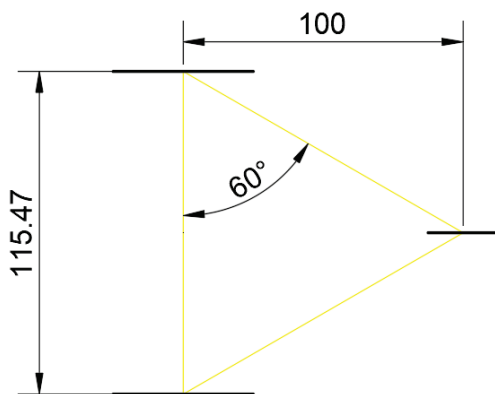


Figure 3 Schematic diagram of front and rear track of carbon-free trolley

2.4 Conjugate Double Cam Steering Mechanism

Steering mechanism is the core part of carbon-free trolley, and its operation accuracy determines the feasibility and optimization degree of trolley steering around pile. In this paper, conjugate double cams are selected as the steering mechanism of the trolley, and in order to realize the adjustability of the steering angle of the cam, the precise thread pair of adjusting screw and knob plunger are used to fine-tune the trajectory of the cam. Take the left rear wheel as the driving wheel and the right rear wheel as the driven wheel to meet the differential demand during steering, as shown in Figure 5.

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as shown in Figure 2. Based on the principle of smooth path transition and shortest travel, this paper chooses path 3 as the ideal path for the trolley in the OPQ section. Path 3 scheme can make the curve path of MNO section and OPQ section smoothly transition, and ensure the trolley steering more smoothly.

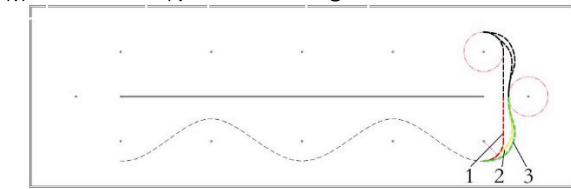


Figure 2 Path analysis of OPQ section

2.3 Overall Structure

Carbon-free trolley is mainly composed of motive mechanism, frame, transmission mechanism, steering mechanism and fine adjustment mechanism. Considering the design requirements, running track and driving stability, the width of the trolley body is less than 300 mm, the height is more than 400 mm, and the centreline distance between the front wheel and the rear wheel is 100 mm. The trolley has three wheels, two rear wheels are responsible for driving and one front wheel is responsible for steering. In order to make the chassis of the trolley more stable, three wheels are arranged in an equilateral triangle, that is, the distance between the two rear wheels is 115.47 mm, as shown in Figure 3. The overall structure of the whole trolley is shown in Figure 4.

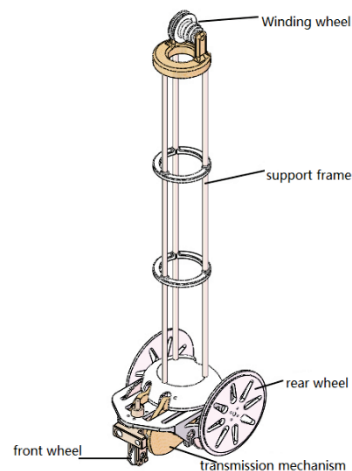


Figure 4 Overall structure of the trolley

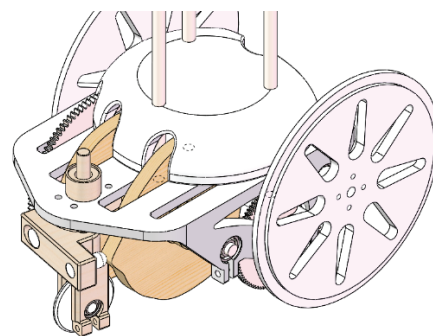


Figure 5 Structure diagram of conjugate double cam

steering mechanism

The cam contour lines corresponding to the paths of MNO section and OPQ section are designed by analytical method and graphic method respectively. The designed cam base circle is 82 mm, the total transmission ratio of front and rear wheels is 24, and the parameters of each cam section are shown in Table 1.

Table 1 Parameters of each cam section

	MN Section	NO Section	OP Section	PQ Section
Proportion	36.048	36.048	13.951	13.951
Accounted for long	92.863	92.863	35.939	35.939
Cam stroke	4.743	4.743	4.743	4.743

According to the cam contour parameters designed above, the disc cam structure is formed by modelling with SolidWorks software. Then, using the "Motion Simulation" module of SolidWorks, another cam conjugated with the cam designed above is drawn by the method of trajectory tracking, as shown in Figure 6. Finally, considering cam installation, stress concentration, 3D printing process and other factors, the two conjugate cams are connected, and a larger fillet is designed at the stress concentration.

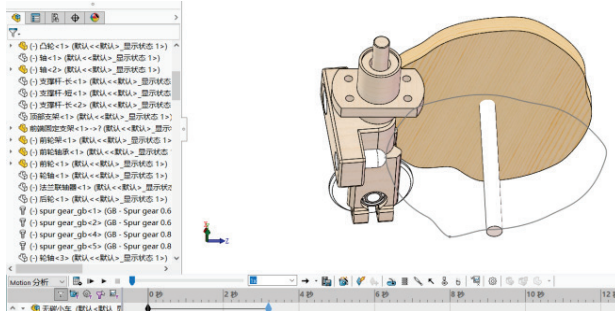


Figure 6 Conjugate cam design in "Motion Simulation" module of SolidWorks

2.5 Transmission Mechanism

The transmission mechanism mainly realizes two functions: (1) to reduce the transmission ratio from the driving shaft to the driven shaft, so as to realize the uniform motion of the trolley. (2) to control the traveling direction of the trolley to ensure that the trolley can run on the scheduled track. In this paper, gears are used as transmission mechanism, as shown in Figure 7, Gear 1 and Gear 2, with 20 and 90 gear teeth, respectively, and with 0.6 mm modulus, mesh with each other. Gear 3 and Gear 4, with 20 and 100 gear teeth, respectively, and with 0.8 mm modulus, mesh with each other. The driving power of the trolley comes from the gravitational potential energy of the mass, and the driving wheel shaft is connected with the mass through winding. When the mass falls, it drives the driving gear shaft to rotate through winding, and then drives the two driven gears to rotate, transmitting the force to the driving wheel and conjugate double cams respectively, and finally realizing the function of converting the potential energy of the mass into kinetic energy.

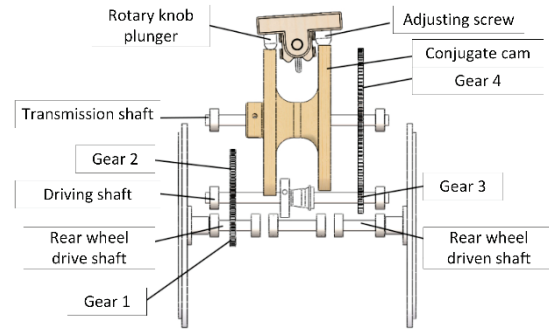


Figure 7 Trolley transmission mechanism

2.6 Frame and Auxiliary Device

The frame structure and cam structure are interrelated, and their structural design needs to be carried out synchronously and coordinated with each other. In order to avoid the oversized cam and ensure the stable centre of gravity of the trolley, we reduced the distance between the front and rear wheels and the distance between the two control ends. Take the distance between the front and rear wheels as 100 mm, and the maximum swing angle of the wheels is 14.856°; The distance between the two control ends is 30 mm, the swing range of the rotating mechanism is 3.11 mm×2, the final frame structure size is 145 mm×102 mm, and the wheel diameter is only 116 mm. The whole trolley is manufactured by integrated with 3D printing, which meets the requirements of precision and geometric dimensions of the trolley.

3. PROTOTYPE MANUFACTURING AND TESTING

3.1 Device Manufacturing

The frame and auxiliary devices of carbon-free trolley are processed by 3D printing process, and the basic processing parameters are set in Repetier-host slicing software: the thickness of the layer is 0.2 mm, the nozzle temperature is 260 degrees Celsius, and the filling degree is 30%. The rear wheel is made of acrylic plate, which is processed independently by CNC milling machine, and the programming of rear wheel pattern processing is assisted by Mastercam software. The gears in the trolley are made of 304 stainless steel by wire cutting machine. The finished product of prototype is shown in Figure 8.



Figure 8 Physical drawing of trolley

3.2 Trajectory Test

3.2.1 Debugging steps of trolley trajectory

The debugging steps of trolley trajectory are divided into four steps:

Step 1: Mark the starting reference position of the trolley on the cam to ensure that the initial position of the trolley is fixed every time it starts.

Step 2: Without mass block, manually push the trolley to move, so as to eliminate the influence of factors such as centripetal acceleration when the trolley starts to accelerate and turns, and constantly adjust the distance between the control ends of the trolley to make its driving track reach the expected ideal track.

Step 3: Place the trolley on the track, drive the trolley by the gravitational potential energy of the mass block, fine-tune the trolley, and make a preliminary departure plan. Adjust the size and shape of the reel according to the speed of the trolley, and start the next stage of debugging only when the trolley can start and will not accelerate all the time.

Step 4: Lock the fine adjustment mechanism of the trolley, and locate the initial position of the trolley.

3.2.2 Track debugging results

Due to the structural design and simulation analysis deviation, manufacturing and assembly error, track randomness and error accumulation, the following two situations exist in the traveling track of the trolley:

Case 1: The centreline of the track tends to approach, as shown in Figure 9. The reasons for its trajectory formation may be as follows:

- 1) The cam size is larger than the ideal size;
- 2) The right control end is too close to the symmetry plane;
- 3) The rod length of the control part of the fine adjustment nut is too long;
- 4) Other factors.

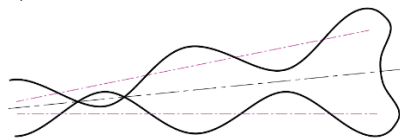


Figure 9 The running track of the trolley tends to approach.

Case 2: The centreline of the track tends to drift away, as shown in Figure 10, and the reasons may be as follows:

- 1) The cam size is smaller than the ideal size;
- 2) The right control end is too far away from the symmetry plane;
- 3) The rod length of the control part of the fine adjustment nut is too short;
- 4) The axis of the control end is not at the same height as the camshaft axis;
- 5) Other factors.

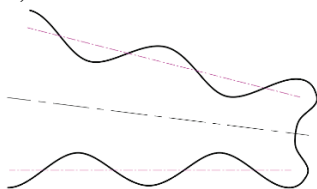


Figure 10 The running track of the trolley tends to drift away.

Solution:

- 1) Re-machining cam parts;
- 2) Unscrew the right control end nut and adjust the distance between the right control end and the symmetry plane;

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- 3) Twist the knob at the end of the fine adjustment nut to adjust the rod length of the control part of the fine adjustment nut.

According to the results, the distance between the cam and the right control end and the symmetry plane, and the rod length of the nut control part are adjusted repeatedly, to make the running track of the trolley reach the ideal state, as shown in Figure 11.

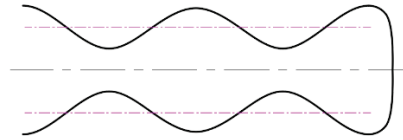


Figure 11 The final trajectory of the trolley

3.2.3 Positioning and debugging of starting point of trolley driving

Select a suitable starting point and angle according to the trolley track, so that the trolley can run in an “S-shaped” track. Specifically, the same angle is the key to make the trolley in the same position every time it starts.

Determine the starting position: use the measuring tool to determine the basic position of the trolley every time it starts.

Determine the starting angle: the starting angle is a sensitive parameter of the carbon-free trolley. Due to the track length is 7280 mm, and if the angle deviates by 1° , the trolley will deviate by 127 mm from the starting point to the end point, which will cause the actual track of the trolley to deviate completely from the ideal track. We use infrared positioning method, that is, fix an infrared ray on the trolley and turn it on, and set up a graduated blackboard at the end of the track, and then adjust the trolley until the infrared ray hits the predetermined point of the blackboard to ensure the consistency of departure angles every time.

4. CONCLUSIONS

In this paper, a carbon-free trolley is designed based on double conjugate cam structure, and the trolley is manufactured by using 3D printing technology. Finally, the feasibility of the carbon-free trolley is verified by experiments. Specific conclusions are as follows:

(1) The trolley steering system based on double conjugate cam structure takes into account the design requirements, running track and driving stability and so on. The structure is novel and can meet the requirements of trolley S-shaped track running.

(2) 3D printing is adopted in the manufacturing process of the trolley, which has a high degree of integration, avoids the use of bearing brackets, ensures the structural accuracy, does not need to consider the height limitation of the bearing seat and its interference, and can achieve the lightweight design goal of the trolley and improve the operation efficiency of the trolley.

(3) The deviation of the traveling track of the trolley is mainly related to the processing, assembly, debugging position, the starting position of the mass falling. The accumulated errors will be enlarged, which will lead to the track out of shape. Among them, the starting position and angle of the trolley have the greatest influence on the track

of the trolley, and special auxiliary structures need to be added to ensure the starting position and angle of the trolley, otherwise the trolley will seriously derail. Therefore, it is necessary to further optimize the design to improve the running accuracy of the mechanism.

ACKNOWLEDGEMENTS

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The Influence of Damping Coefficient of Magnetorheological Grease Torsional Damper on System Dynamic Performance

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Abstract: Magnetorheological (MR) grease torsional damper has variable damping characteristics. This paper mainly studies the influence of damping coefficient of torsional vibration damper on the system dynamic performance, which provides a theoretical basis for the subsequent engineering application. A torsional vibration damper based on MR grease is designed, and the mathematical models of damping coefficient with torsion angle and amplitude amplification coefficient of torsional vibration damping system are respectively established by MATLAB/Simulink, and the influence of key parameters of damper on torsional vibration control effect under different working conditions is analyzed. The experimental results show that with the increase of damping coefficient of torsional damper, the reduction speed of torsional vibration is also accelerated, and the value of the vibration equilibrium point of the torsional vibration decreases. In addition, under different frequency ratios, the value of damping coefficient increases continuously, and the value of amplitude amplification coefficient changes differently.

Keywords: Magnetorheological (MR) grease; Torsional damper; Damping coefficient; Frequency ratio

1. INTRODUCTION

Crankshaft is one of the most important components in the engine, it will produce torsional vibration in the process of operation, which will not only affect the stability of the crankshaft, but also damage the crankshaft [1,2]. At present, the torsional vibration control mode usually uses the fixed damping torsional vibration damper, which has the limitation of not ensuring the best performance of vibration reduction in real time. The magnetorheological (MR) grease has the characteristics of real-time reversible control and rapid response, and it is not easy to settle and has good stability, so it has a broad prospect in the application of vibration control [3-6].

In 2007, Gordaninejad and other researchers of Nevada University applied MR grease in clutches, and its output torque was 75% higher than that of the MR fluid. Kavlicoglu *et al.* carried out further application research on MR grease brake system to verify its engineering applicability [7]. In 2017, Sakurai *et al.* described an application of MR grease dampers as seismic dampers for a three-story steel structure [8]. Shiraishi *et al.* conducted in-depth exploration of MR grease with high reliability and wide dynamic range and semi-active vibration control

using the damper [9].

The above researches show the application prospect and feasibility of MR grease in vibration control. In this paper, based on the characteristics of MR grease, it will be applied to the engine torsional vibration device, focusing on the analysis of the influence of its damping coefficient on the dynamic performance of the system, so as to provide a theoretical basis for the subsequent engineering application.

2. MR GREASE TORSIONAL DAMPER STRUCTURE

2.1 Structure Design

The engine torsional vibration damper based on MR grease is divided into two cavities, the upper cavity is filled with MR grease, and the lower cavity is filled with silicone oil damping fluid. When the crankshaft torsional vibration occurs, the torsional damper shell and the internal inertia block will rotate relative to each other, so as to transform the vibration energy into the grease internal energy in the cavity, and finally achieve the control effect of vibration reduction.

The structure of torsional vibration damper is shown in Figure 1, including MR grease chamber end cover, gasket, damper shell, inertia block and silicone oil chamber end cover.

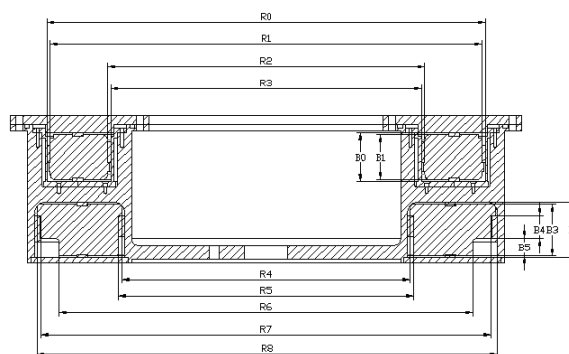


Figure 1 Structure diagram of torsional vibration damper Where R_0 and R_3 are the external diameter and inner diameter of the MR grease chamber respectively; R_1 and R_2 are the outer and inner diameter of the inertia block respectively; B_0 and B_1 are the height of the MR grease chamber and the inertial block; R_4 , R_5 , R_6 , R_7 and R_8 are the diameter of the silicone oil chamber and inertia block respectively. B_2 , B_3 , B_4 , and B_5 are the height of the silicone oil chamber, inertia block, groove and the oil inlet.

2.2 Structural Parameters Selection

The empirical damping ratio can be expressed as follows:

$$\gamma_p = \frac{C_p}{2I_d\omega_n} = \frac{1}{\sqrt{2(u+1)(u+2)}} \quad (1)$$

Where C_p is the empirical damping coefficient, the inertia ratio of the torsional shock damper can be taken as $\mu=0.33$. The moment of inertia of the inertia ring of MR grease can be obtained from Equation (2):

$$J_{d1} = \frac{m}{8}(R_1^2 - R_2^2) \quad (2)$$

Where m is the mass of inertia ring, which is set as 30kg. The size of inertia ring can be calculated according to $R_2/R_1 \approx 0.5$, $B_1/R_2 \approx 0.4$. The clearance size is designed as: $C_1, C_2 \leq 0.25 + 0.25\sqrt{R_2/250}$ (mm). Considering that the heat energy dissipates quickly in shock damper operation, the thinner the shock damper size is the better, generally take 3-5mm.

The rotational inertia of the inertia block of the silicone oil layer can be obtained from Equation (3):

$$J_{d2} = \frac{m_1}{8}(R_6^2 - R_5^2) + \frac{m_2}{8}(R_7^2 - R_6^2) \quad (3)$$

Where m_1 is the mass of the first part of the inertia ring, set as 20 kg, m_2 is the mass of the second part of the inertia ring, set as 10 kg. Similarly, in order to dissipate heat quickly, the clearance distance is generally chosen 3-5mm. Based on the above parameter analysis, the structural parameters of shock damper are given as shown in Table 1.

Table 1 MR grease damper structural parameters

R1/mm	250
R2/mm	184
R7/mm	260
R6/mm	240
B1, B3/mm	26, 30
C1, C2/mm	0.3, 0.3
$J_d/\text{Kg.m}^2$	0.9585

3. SIMULATION ANALYSIS OF DAMPING COEFFICIENT AND TORSION ANGLE

The mutual motion between an engine crankshaft and a torsional vibration damper can usually be simplified to the physical model shown in Figure 2.

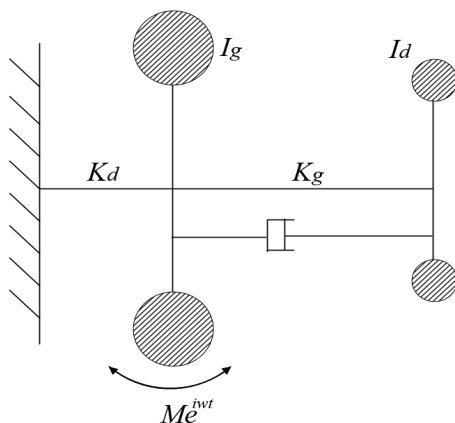


Figure 2 Physical model of torsional vibration damper
Where I_g and I_d are the moment of inertia of the torsional vibration damper and the engine crankshaft respectively; K_g and K_d are the stiffness of torsional vibration damper and engine shafting respectively; Me^{iwt} is the disturbing

torque.

The coefficients are defined as follows:

$$A = \frac{K_d}{I_d} \quad (4)$$

$$B_1 = \frac{\delta_d}{I_d} \quad (5)$$

$$C = \frac{K_g}{I_g} \quad (6)$$

$$D = \frac{K_g}{I_g} \quad (7)$$

$$E = \frac{\delta_d}{I_g} \quad (8)$$

$$Q = \frac{Me^{iwt}}{I_g} \quad (9)$$

According to D'Alembert's principle, the motion differential equation of shafting is established, as shown in Equation (10):

$$\begin{cases} \ddot{\Phi}_d = -A(\Phi_d - \Phi_g) - B_1(\dot{\Phi}_d - \dot{\Phi}_g) \\ \ddot{\Phi}_g = -\Phi_g(C + D) + D\Phi_d - E(\dot{\Phi}_g - \dot{\Phi}_d) + Q \end{cases} \quad (10)$$

where, ϕ_d is the torsional angle of the MR damper and ϕ_g is the torsional angle of the shafting.

In order to analyze the influence of damping coefficient on torsion angle, based on the established mathematical model, the simulation model of damping coefficient and torsion angle is established by Matlab / Simulink software, as shown in Figure 3.

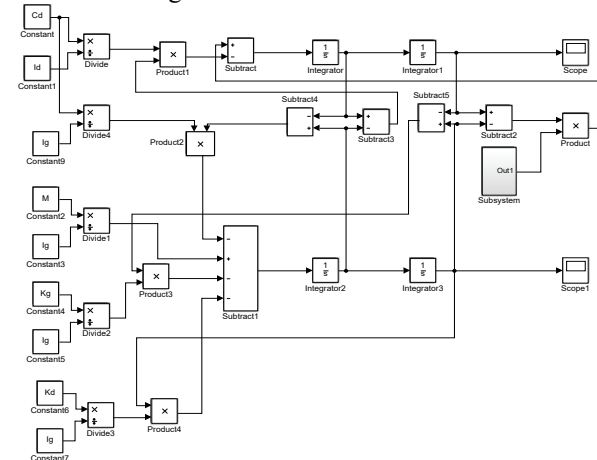


Figure 3 Model diagram of relationship between damping coefficient and torsion angle

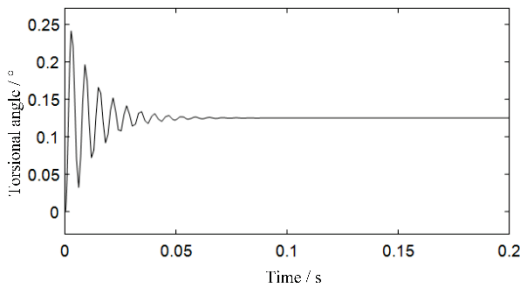
Figure 3 shows the model diagram of the relation between damping coefficient and torsion angle, in which the parameters need to be assigned. The values of some simplified parameters of an engine crankshaft are shown in Table 2.

Table 2 Reference values of torsion Angle modeling parameters

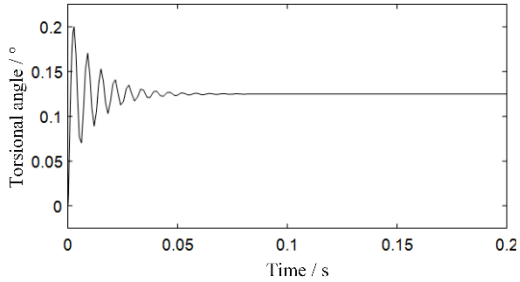
$I_d/\text{kg.m}^2$	4×10^{-3}
$K_d/\text{N.m.rad}^{-1}$	8×10^3
$I_g/\text{kg.m}^2$	2.1×10^{-3}
$K_g/\text{N.m.rad}^{-1}$	5.2×10^3

The variation law of torsional angle of MR grease torsional damper with time is shown in Figure 4-6 when

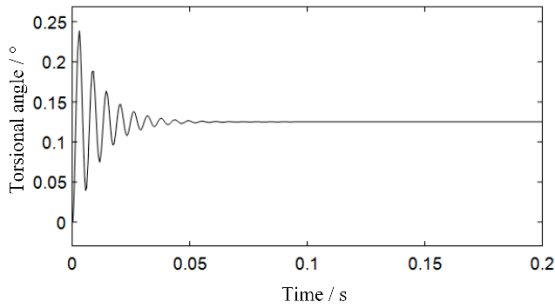
damping coefficients are 5, 10 and 15 respectively.



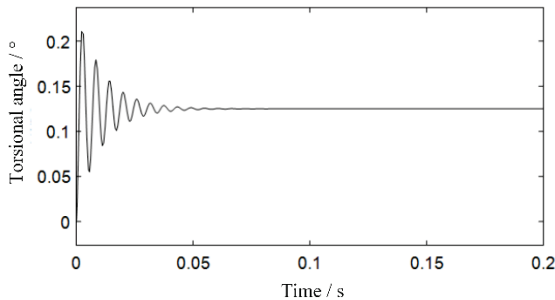
(a) Torsional angle of the torsional shock absorber



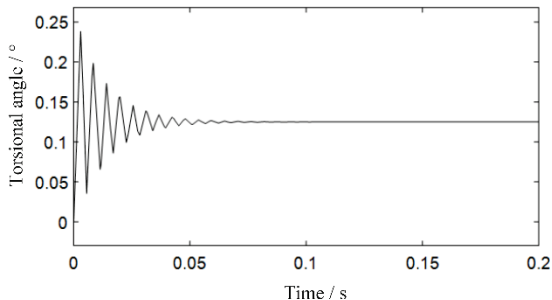
(b) Torsional angle of engine equivalent shafting
Figure 4 Torsional angle between torsional shock absorber and equivalent shafting when damping coefficient is 5



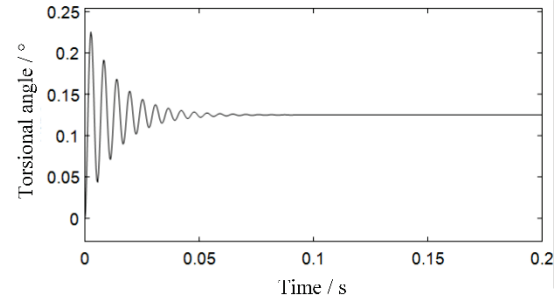
(a) Torsional angle of the torsional shock absorber



(b) Torsional angle of engine equivalent shafting
Figure 5 Torsional angle between torsional shock absorber and equivalent shafting when damping coefficient is 10



(a) Torsional angle of the torsional shock absorber



(b) Torsional angle of engine equivalent shafting

Figure 6 Torsional angle between torsional shock absorber and equivalent shafting when damping coefficient is 15

It can be seen from Figures 4-6 that it takes a long time for the torsion angle to reach equilibrium when the damping coefficient is small. And with the gradual increase of the damping coefficient, the time to reach the equilibrium also decreases. However, after the continuous increase of the damping coefficient, the time to reach the equilibrium no longer decreases or even increases to some extent.

The relationship between the damping coefficient and the vibration equilibrium point is shown in Figure 7. When the damping coefficient increases from zero, the value of the vibration equilibrium point decreases continuously. When the damping coefficient continues to increase, its curve starts to slow down, and even increase to some extent. So it can be known that the value of damping coefficient should not be too large, or it will even affect the vibration reduction effect.

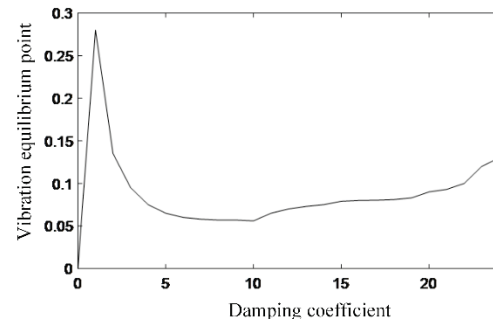


Figure 7 Relation diagram between damping coefficient and vibration equilibrium point

4. SIMULATION ANALYSIS OF DAMPING COEFFICIENT AND AMPLITUDE AMPLIFICATION COEFFICIENT

In order to derive the equation of damping coefficient and amplitude amplification coefficient, the following coefficients are defined:

$$M = \frac{\omega_d}{p} \quad (11)$$

$$N = \frac{\omega}{p} \quad (12)$$

$$r = \frac{C_d}{2I_d P} \quad (13)$$

where, ω_d is the circular frequency of the MR damper, and p is the circular frequency of the shafting system.

Then, the mathematical model between damping coefficient and amplitude amplification coefficient is established:

$$K = \frac{(M^2 - N_1^2)^2 + 4N_1^2 r^2}{[(M^2 - N_1^2)(1 - N_1^2) - \mu A^2 N_1^2] + 4A^2 r^2 (1 - N_1^2 - \mu N_1^2)} \quad (14)$$

Under different frequency ratios (0.6, 0.8, 1.0, 1.4 and 2.0, respectively), the relationship between amplitude amplification coefficient and damping coefficient of MR damper is shown in Figure 8.

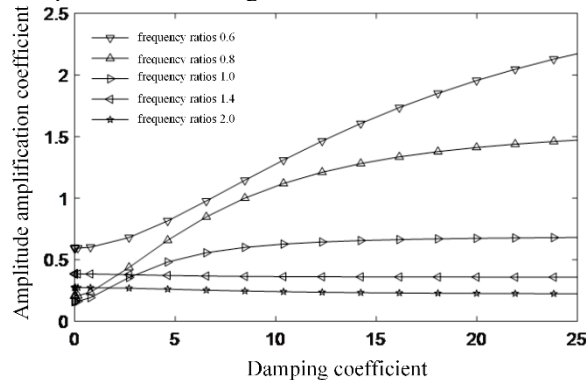


Figure 8 Comparison of amplification coefficients of different frequency ratios

As shown in Figure 8, under the condition of the same damping coefficient, the influence of different frequency ratios on the amplitude amplification coefficient does not change linearly, but has a certain critical value. When the value of frequency ratio rises to the critical value, the amplitude amplification coefficient of torsional damper will no longer increase with the increase of damping coefficient, but will decrease. Therefore, in the design of torsional damper for variable damping engine, the frequency ratio should not be too large, otherwise it will affect its variation range.

5. CONCLUSIONS

In this paper, a kind of MR grease torsional damper is designed and developed, and the theoretical model of damping coefficient, torsion angle and amplitude amplification coefficient is established by Matlab/Simulink. The specific results are as follows:

- (1) The designed torsional MR grease damper has the characteristics of controllable and adjustable damping parameters, and has the application prospect of engineering intelligent damping control.
- (2) Through the above analysis of damping coefficient, torsion angle and amplitude amplification coefficient, it can be seen that the designed variable damping torsional damper can achieve better damping coefficient selection and frequency ratio determination, and has good engineering applicability and feasibility for vibration

reduction application, and has broad application prospects.

ACKNOWLEDGMENT

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Comparison of Feature Extraction Algorithms for Facial Expression Recognition

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Abstract: Face expression recognition technology has been widely used. In this paper, for the typical feature extraction algorithm in facial expression recognition, this paper describes PCA algorithm based on global appearance, LBP algorithm based on local appearance and LTP algorithm, and compares three algorithms in Jaffe database. Finally, the three algorithms are extracted by SVM classifier the signs were compared.

Keywords: PCA; LBP; LTP; SVM; Facial expression recognition

1. INTRODUCTION

With the continuous efforts of researchers, the recognition accuracy and efficiency of human facial expression recognition technology have been significantly improved, which has been widely used in education, entertainment and security. At present, with the continuous development of artificial intelligence technology, deep learning technology has achieved good performance in image feature extraction. However, it faces the problems of small sample size and large amount of calculation. The traditional machine learning method is still the main method of human facial expression recognition. The process of facial expression recognition mainly includes image preprocessing, image feature extraction and feature classification. The performance of facial expression recognition is determined by the feature extraction of image[1]. Among the facial expression feature extraction algorithms, the feature extraction algorithm based on appearance has become the hot spot of facial expression feature extraction because of its excellent robustness and high recognition rate. In the appearance based feature extraction algorithms, there are mainly global appearance feature extraction and local appearance feature extraction. The common algorithms of global appearance feature extraction technology are principal component analysis (PCA), linear discrimination Analysis (LDA) and so on. These methods focus on the general deformation of facial components of the whole facial image; the commonly used algorithms based on local appearance feature technology include local spatial pattern (LBP), local domain Pattern (LTP), which describes the subtle changes caused by different facial expressions, has high recognition ability and high robustness for the texture and edge features of the image. In this paper, in the process of facial expression feature extraction, PCA algorithm, LBP algorithm and LTP algorithm are respectively used to describe the process of facial feature extraction, and three feature extraction

algorithms are tested and analyzed. Finally, SVM classifier is used to identify the effect of feature comparison extraction [2].

2. PCA ALGORITHM

Using PCA algorithm, a series of data that may have correlation are projected into a series of linearly uncorrelated data values, so as to obtain the main components of the data. In the process of projection, a series of related information will be linearly represented, and the noise data such as illumination and shadow will be removed, while the core part of the data will be retained, so that the data will be distorted [3]. When PCA algorithm is used to extract image features, firstly, the gray image set s : s is constructed

$$S = \begin{pmatrix} \xi_{1,1} & \cdots & \xi_{1,n} \\ \vdots & \ddots & \vdots \\ \xi_{m,1} & \cdots & \xi_{m,n} \end{pmatrix} \quad (1)$$

It is expressed as the pixel gray value vector of the image, and then the average vector of s set is calculated. If facial expression is used, the value of each line is calculated as follows:

$$\psi_i = \frac{1}{n} \sum_{j=1}^n S_{i,j} \quad (2)$$

Calculate the standard training matrix(X).

$$X = \begin{pmatrix} \xi_{1,1} - \psi_1 & \cdots & \xi_{1,n} - \psi_1 \\ \vdots & \ddots & \vdots \\ \xi_{m,1} - \psi_m & \cdots & \xi_{m,n} - \psi_m \end{pmatrix} \quad (3)$$

covariance matrix(C_X):

$$C_X = XX^T = Q\Lambda Q^{-1} \quad (4)$$

Formula 4 is the eigenvector matrix of, and the matrix Q is also the best projection vector in the new coordinate system, which is called the basic vector. The eigenvectors of Q are arranged in descending order according to their corresponding eigenvalues. It is a diagonal matrix composed of eigenvalues sorted in descending order [4]. Finally, the first feature vector is selected and used for feature mapping. As shown in Fig. 1, the eigenvector can be reconstructed as an image called an eigenplane.

The matrix of set (s) is transformed into a k-dimensional matrix as follows:

$$Y_k = Q_k^T S \quad (5)$$

The global feature size of facial expression image

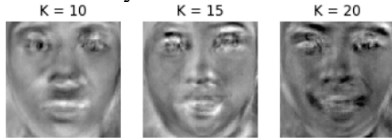


FIGURE 1. The Kth eigenvectors are reconstituted into eigenfaces

3. LBP ALGORITHM

Local binary patterns (LBP) algorithm is a texture classification operator first proposed by Ojala et al. [5] in 1996. It has the characteristics of simple calculation and constant gray level in extracting local features, and is widely used. When LBP algorithm extracts local features, a 3×3 gray pixel unit will be defined, and the center pixel value will be calculated with the adjacent 8 pixels in turn. The point larger than the center pixel value will be set to 1, otherwise it will be set to 0 [6]. After the comparison is completed, the values of the eight points are combined into a group of binary numbers according to the specified order, and then converted into decimal numbers, that is, the LBP characteristics of the center point are obtained. The 3×3 gray pixel unit is moved according to the secondary method, and all pixels in the image are traversed in the order from top to bottom and from left to right, and the LBP characteristic value of the local feature extraction area is calculated [7]. The image coding formula is as follows:

$$LBP = \sum_{p=0}^7 2^p s(g_p - g_c) \quad (6)$$

$$s(x) = \begin{cases} 1, & x \geq 0 \\ 0, & x < 0 \end{cases} \quad (7)$$

Figure 2 shows the process of LBP operation.

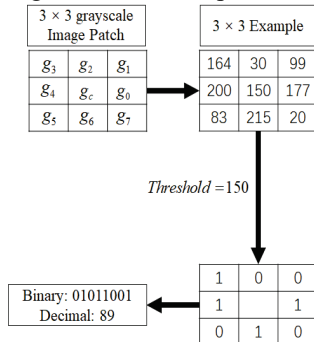


FIGURE 2. The example of LBP operator

Since the region encoded by LBP is equivalent to the LBP value of the histogram, the region is converted to LBP. The LBP encoded image is shown in Figure 3.

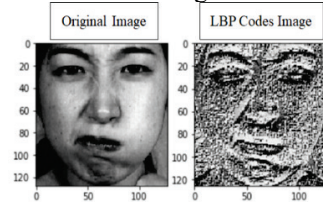


FIGURE 3. The example of LBP codes image
LBP characteristics are calculated by formula (8).

$$H_l = \sum_{i,j} \{L(i, j) = l\}, l = 0, \dots, 255$$

(8)

Where l is each possible pattern of the LBP code, and i and j refer to the location of the LBP code on the LBP code image.

Figure 4 shows an example of LBP feature image histogram.

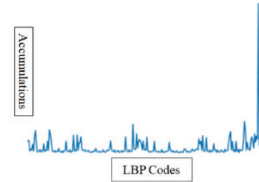


FIGURE 4. The example of LBP feature

It can be seen from the above figure that LBP is more sensitive to random noise and non monotonic illumination. At the same time, it is found that the feature information retained by LBP feature extraction is very limited.

4. LTP ALGORITHM

Local antenna pattern (LTP) algorithm, which is different from LBP algorithm in binary coding, adopts ternary coding. LTP algorithm first defines a 3×3 gray pixel unit, and selects a threshold T , then compares the center pixel value with the adjacent 8 pixels. If the image difference between the center and adjacent points is greater than the threshold T , the point is set to 1; if the oak difference between the center and adjacent points is greater than $-t$ and less than t , it is set to 0; in other cases, it is set to -1 . The ternary code of LTP can be expressed as $s(1, 0, -1)$:

$$s(x) = \begin{cases} 1, & x \geq t \\ 0, & |x| < t \\ -1, & x \leq -t \end{cases} \quad (9)$$

The LTP of each pixel is calculated as follows:

$$LTP = \sum_{p=0}^7 2^p s(g_p - g_c) \quad (10)$$

The negative value in the coding is beyond the range of gray level when the pixel is encoded by the rule of formula (9), and then the characteristic value is converted. Therefore, the LTP codes are divided into local pattern lower() and local pattern upper(), and the calculation formula of encoding is as follows:

$$LTP_L = \sum_{p=0}^7 2^p \Delta(g_c - g_p - t) \quad (11)$$

$$LTP_U = \sum_{p=0}^7 2^p \Delta(g_p - g_c - t) \quad (12)$$

After calculating the coding of a central point according to 11 and 12 formulas, the gray pixel blocks are moved according to the order from top to bottom and from left to right, and the sum codes of all pixels are calculated, and the h_{ltp1} and h_{ltp2} histograms are drawn respectively. Then the sum coding of each pixel is calculated by formula 13, and the image features of LTP can be obtained. The recognition performance of LTP for image

texture depends on the selection of appropriate threshold value.

$$H_{LTP} = H_{LTP_L} // H_{LTP_U}$$

(13)

An example of LTP encoding is shown in Figure 5.



FIGURE 5. The example of LTP codes image

The feature example of LTP algorithm is shown in Figure 6.

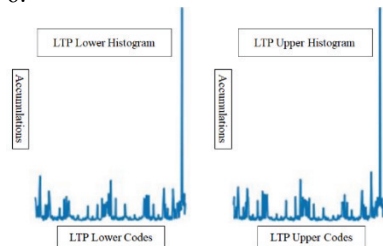


FIGURE 6. The example of LTP feature

An example of LTP algorithm is shown in Figure 7.

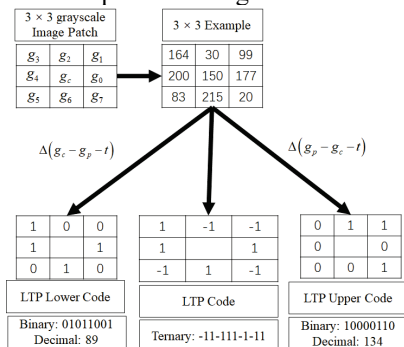


FIGURE 7. The example of LTP operator

5. ANALYSIS OF THE EXPERIMENT

In order to compare the effects of PCA, LBP and LTP, we conducted experiments on Jaffe database. The experimental environment of software and hardware including the development platform includes JetBrains pychar Community Edition 2018.2.4 x64 and python 3.7; the CPU is Intel (R) core (TM) i7-4710hq-2.50ghz; the system memory is 16 GB; the operating system is 64 bit Microsoft Windows 10.

Japanese female facial expression (Jaffe) was planned and assembled by Michael Lyons, kayiya Miyuki and Jiro gyoba. There are 213 images of 10 Japanese women in Jaffe database. Each image is marked as one of seven expressions (anger, disgust, fear, happiness, sadness, surprise and neutrality), and each expression has three or four images [8]. Each image with 256x256 resolution was taken in the psychology department of Kyushu University in Japan. Therefore, the normalized Jaffe is a well-known facial expression dataset that is publicly available.

For the features extracted by PCA, LBP and LTP, the K value of PCA is set to 20, and the threshold value of LTP

is set to 10. After feature extraction, SVM classifier is used for classification and recognition. The recognition rate of PCA algorithm is 87.4%, that of LBP algorithm is 88.5%, and that of LTP algorithm is 90.2%. It can be seen from the experimental results that although PCA algorithm retains the main components of the image and removes a lot of redundant information, it still receives the interference based on the imaging conditions such as illumination and noise, and loses a lot of detail information that can be used for classification; LBP improves the influence of PCA under uniform illumination, and also retains the detail information, but it is binary LBP does not improve the noise interference; the threshold setting of LTP can improve the noise interference of LBP, and its ternary characteristic makes more details of the image preserved.

Algorithm	Recognition Rate (%)
PCA+SVM	87.4
LBP+SVM	88.5
LTP+SVM	90.2

6. CONCLUSION

This paper compares PCA algorithm, LBP algorithm and LTP algorithm commonly used in facial expression recognition, and classifies features by SVM through image experiment in Jaffe database. The experimental results show that LTP has better effect on feature extraction and higher accuracy.

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Study on Influence Factors of Hydration Heat of Mass Concrete

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Abstract: During the construction of bridge cap in winter, the hydration heat problem of mass concrete pouring easily leads to dense temperature cracks on the structure surface, which affects the construction quality and durability. The finite element model of hydration heat of mass concrete is established by Midas FEA software to study the influence of pipe cooling system on the temperature gradient of mass concrete of bridge cap during winter construction. The calculation and analysis show that the pipe cooling system can effectively reduce the peak temperature of mass concrete and increase the cooling rate, but it cannot meet the requirements of the code for the temperature difference between the inner surface and the outer surface during the winter construction of the pile cap. Special temperature control measures should be adopted to ensure the construction quality of the mass concrete pile cap in winter.

Key words: Winter construction; Mass concrete; Temperature crack; Pipe cooling system; Temperature control measures

1. INTRODUCTION

In recent years, with the development of bridge construction technology and the increase of bridge scale, mass concrete structure is widely used. With the continuous hydration reaction of cement, the temperature inside the pile cap rises sharply, which leads to a large temperature gradient, which is easy to cause concrete cracking, thus affecting the construction quality of the structure. Therefore, it is necessary to study the temperature field distribution of mass concrete and reasonable temperature control measures.

In order to solve the above problems, the finite element

Table 1 Environment and material parameters

parameter	numerical value	parameter	numerical value
Convection coefficient($W/(m^2 \cdot ^\circ C)$)	13	Concrete density(kg/m^3)	2500
Thermal conductivity($W/(m \cdot K)$)	2.8	specific heat($KJ/kg \cdot ^\circ C$)	1.05
Elastic modulus(MPa)	3.45×10^4	Poisson's ratio	0.2
Concrete casting temperature($^\circ C$)	8	ambient temperature($^\circ C$)	5

4. NUMERICAL ANALYSIS OF THE MODEL

4.1 Temperature field of bearing platform

Under the condition of no pipe cooling system, the core temperature reaches $68.6^\circ C$ at 115h, and the side surface temperature reaches $42.8^\circ C$ at about 50h. After reaching the peak temperature, the core and side surface temperature began to decrease, and the cooling rates of core and side surface were 1.17 and 2.50 respectively. When the injection temperature is $8^\circ C$, the maximum temperature appreciation of the core and side surface of

analysis model of hydration heat of bearing platform is established based on the project of ningliang Expressway Crossing Beijing Kowloon railway overpass constructed in winter in North China. The influence of pipe cooling system setting on temperature field distribution of bearing platform is studied, and reasonable temperature control measures are put forward.

2. PROJECT OVERVIEW

The design strength grade of concrete is C50 and the pouring volume is $2515m^3$. In order to reduce the influence of hydration heat, the lower bearing platform is poured in two layers, the first layer pouring height is 3.9m, and the second layer pouring height is 1.1m. The construction period of lower bearing platform is January 2020, at this time, Liangshan area has entered the winter construction season.

3. FINITE ELEMENT ANALYSIS MODEL OF PILE CAP

3.1 Modeling

Taking the following pile cap as an example, the simulation analysis model of pile cap construction process is established by using Midas FEA finite element analysis software according to the actual size of the lower bearing platform, and 1 / 4 part of the upper bearing platform is taken to establish the model according to the principle of symmetry. In order to improve the efficiency and accuracy of analysis, high order hexahedron elements are used in the whole structure.

3.2 Environment and material parameters

According to GB 50496-2018 code for construction of mass concrete, relevant parameters in finite element model of lower bearing platform are calculated, and some parameters are shown in Table 1.

the pile cap is $60.6^\circ C$ and $34.8^\circ C$ respectively. From the beginning of concrete pouring to the time before the temperature reaches the peak value, the inner surface temperature difference gradually increases with time, and reaches the maximum value of $37.4^\circ C$ at 190h, which has exceeded the maximum value of $25^\circ C$ specified in the specification. Sufficient thermal insulation measures should be taken on the surface of bearing platform to reduce the temperature difference between inner surface and outer surface.

4.2 Temperature field of bearing platform with pipe cooling system

The actual pipe cooling system on site is made of 38×3.5 mm thin-walled steel pipe, which is connected with the water pipe joint by screw thread sleeve, and the pipe cooling system is arranged in the form of pipeline; there are three layers in the vertical direction with a layer spacing of 2m, and the upper and lower pipe cooling system is 0.5m away from the upper and lower surface of the lower bearing platform. Midas FEA was used to simulate the arrangement of pipe cooling system. The inlet temperature was set at 5°C and the flow rate was $2\text{m}^3/\text{h}$. the time-varying curve of temperature was extracted and analyzed.

When the pipe cooling system is set in the lower bearing platform, the core temperature reaches the peak temperature of 64.2°C at about 85h, and the temperature of side surface reaches the peak temperature of 42.4°C at about 50h. After reaching the peak temperature, the core and side surface temperatures began to decrease, and the cooling rates were 3.79 and 4.37, respectively. The maximum temperature rise of core and side surface temperature is 56.2°C and 34.4°C on the basis of injection temperature of 8°C , as shown in Fig. 1.

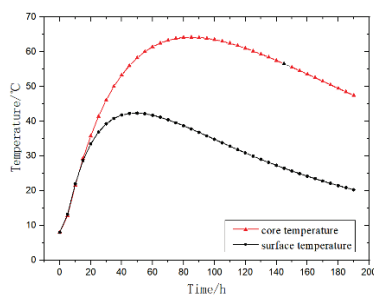


Fig. 1 Temperature variation curve of core and side surface with tube cooling system

After concrete pouring, the inner surface temperature difference gradually increases, and the maximum temperature difference between inner surface and outer surface reaches 30.3°C at 130 h, which exceeds the maximum value of 25°C specified in the specification.

5. COMPARATIVE ANALYSIS OF TEMPERATURE FIELD WITH AND WITHOUT TUBE COOLING SYSTEM

In order to analyze the influence of the pipe cooling system on the temperature distribution of the bearing platform, the time-varying curve of the temperature with or without the pipe cooling system is plotted as shown in Fig. 2.

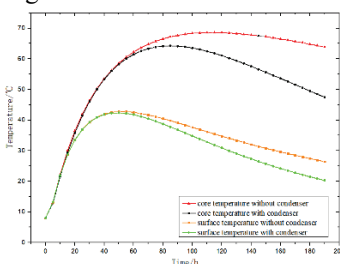


Fig. 2 Temperature variation curve with and without tube cooling system

5.1 When the tube cooling system is arranged, the peak temperature of the core and side surface are reduced, and the time to reach the peak temperature is shortened; the cooling rate of the core and side surface temperature is increased, which indicates that the tube cooling system has a good cooling effect. However, the cooling rate of the lateral surface of the pile cap is still higher than the specified value of 2 in the code, and the maximum temperature appreciation of the core temperature is also greater than the specified value of 50°C .

5.2 No matter whether the tube cooling system is set or not, the trend of temperature difference between inner surface and inner surface increases gradually with time, and the maximum value of temperature difference between inner surface and inner surface is 25°C higher than the specified value.

In conclusion, the mass concrete construction of bridge cap in winter will release a lot of hydration heat. In order to ensure that the cooling rate and the temperature difference between inner surface and outer surface meet the specification requirements, effective temperature control measures should be taken to reduce the temperature gradient of mass concrete.

6. CONCLUSION

Based on the overpass project of ningliang Expressway Crossing Beijing Jiulong Railway, the influence of pipe cooling system on temperature field distribution of mass concrete of bridge cap during winter construction is studied. The analysis results show that: only relying on the pipe cooling system can not meet the requirements of the construction technical specifications of mass concrete bearing platform. Therefore, special temperature control measures are taken for the construction of mass concrete of bridge bearing platform in winter.

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Problems and Countermeasures in Quantitative Assessment of Excellent Classes -- Taking College of Physics and Electronic Engineering of Sichuan University of Science & Engineering as An Example

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Abstract: The construction of class collective is related to the form of College Students' self-management, self-education and self-service, and has a great impact on college students during their reading. At present, in the excellent class collective construction, the goal is not clear, the focus is not prominent, and the team management is not perfect. Colleges and universities should actively create excellent class collective by implementing target management, establishing class quantitative assessment system, improving management process.

Keywords: Excellent Class Collective; Quantitative; Assessment

1. PROBLEMS IN THE COLLECTIVE QUANTITATIVE ASSESSMENT OF EXCELLENT CLASSES

Class collective is the basic organizational form of College Students' self-management, self-education and self-service. It is also an important carrier for college students' growth and development in an all-round way. In order to promote the construction of academic atmosphere, colleges and universities have carried out various forms of collective selection of excellent classes [1-3]. In this paper, from the problems encountered in the process of excellent class collective construction, put forward targeted strategies. To provide reference for the construction of excellent class collective, improve the quantitative assessment system of excellent class collective, and create a better class environment for students.

1.1 The evaluation materials are not standardized, and there are temporary patching up. General requirements of materials: the cadre structure of the class committee is complete, the responsibilities of each member are clear, the division of labor is clear, unity and cooperation, the class has its own management plan, which is detailed, complete, highly operational and implemented in place. In practice, most of the classes have a complete cadre structure of the class committee, but the division of responsibilities is not very clear. As for the management scheme mentioned, many classes do not have it, and even some class cadres are not clear about their own responsibilities. This results in a lot of work in the class to monitor to complete, not to mention a strong operability. In order to make the data

better, some classes have the behavior of temporary patching up materials when submitting the evaluation materials. As reflected in the scale, 100% of the classes submitted materials. To say the least, some details of the evaluation materials are not clear, or only focus on the existence, not on the process.

1.2 There are many bonus points for students' activities, and some activities can be awarded. The bonus items are not clear. In order to encourage students to participate in various competitions and activities, it is also necessary to cultivate students' all-round development. There is no big problem in adding points to the activities specified in the detailed rules, and some classes also require extra points for some online competition activities. In some online competitions, students should be encouraged to participate, and the certificates issued after taking part in them should be given extra points. If there are many students, they should be given more points than those who do not participate. Compared with the same participating class, this kind of bonus item seems to have too much water.

1.3 The bonus points of the activities are basically declared separately, and there is no reference material during the audit. For example, the sports meeting and group calisthenics require independent declaration, which is no problem. All classes basically declare according to the facts, but there is no data to refer to in the audit. If the students are in the class, they can try to provide the reference score by the Department of learning and engineering. If there is any doubt in each class, they can apply for revision. In this way, the confusion of declaration and the lack of reference materials in the audit can be avoided.

2. ON THE DEDUCTION ITEMS IN THE QUANTIFICATION OF EXCELLENT CLASSES

2.1 There were different times of supervision on the style of study, and no score was deducted for being late and leaving early. The problem with the style of study supervision group is that there is no standard to follow in the process of operation. Maybe it is simply to supervise the number of absentees, and the supervision of late and early leave is not very good. In addition, the number of inspectors in each class is different, which leads to different deduction of final inspection points. There are

some objections in the submission of quantitative expression. In addition, individual collective sense of honor is not strong, students do not like learning, often absent from work, resulting in personal buckle full situation.

2.2 The safety inspection team is often in a dispensable position, and the dormitory safety supervision is basically in a vacuum. The safety situation of the dormitory is not completed by fixed team members, but temporary supervision of students from the two committees is organized at the key nodes, and the results of the supervision are not unified.

3. THE SELECTION OF EXCELLENT CLASS IS TO FULLY FULFILL THE REWARDS AND PUNISHMENTS

The results of the group preliminary competition of the excellent class provide the place for the final, but the required cancellation index has not been fully realized. It is mentioned in the selection rules that: for the class ranking in the bottom three in the preliminary contest, the class will be selected "three excellent and one work" according to the situation, and the corresponding indicators will be reduced or cancelled in the evaluation and award of excellent learning scholarship, national scholarship, national inspirational scholarship and national scholarship. There is a time conflict between the selection results of the preliminary competition and the above-mentioned indicators. For example, some awards need to be very urgent, and the indicators assigned by the university to the college are broken down, and the time is not up. In addition, in the above indicators, because different teachers are responsible for different sections, there is no unified coordination within the college, so the above-mentioned indicators are not cancelled according to the results of the preliminary competition. Then the significance of this existence is not so great, or the proposed rules have not been implemented, so we have a vacuum in the process of educating people. In this way, some classes, because of class cohesion, do not have class cadres to take the initiative to undertake the selection task, resulting in the abandonment of part of the evaluation indicators, so that the class selected by the college may not have such a high gold content.

4. THE QUANTITATIVE CONTENT OF EXCELLENT CLASS SHOULD BE ADJUSTED ACCORDING TO THE ACTUAL NEEDS

The cultivation of college students cannot be separated from the carrier of class collective. In the new environment, the school puts forward the quantitative index of "11258", which provides a quantitative standard for cultivating college students to adapt to the times. The construction of advanced class group in the college should be modified according to the school's index.

4. 1. Enrich the scoring items. There are corresponding collective bonus items in the collective content of advanced classes in the college, most of which are focused on English and computer passing. There is no obvious regulation on the professional qualification certificate. Combining with the major, students can be encouraged to obtain the qualification certificate of relevant industries.

On the one hand, it can enhance their own competitiveness, on the other hand, it can also improve the employment quality of our college graduates. For example: students in the electronic field get electrician certificate, students in physical direction get teacher qualification certificate, and other qualifications for employment.

4.2 Implement students' sense of achievement. The advanced class group of the college has more contents, and the evaluation is also a lot of work. It seems that there is no other real thing except the rank and bonus in a round of evaluation. For example, the 20% postgraduate entrance examination rate in the "11258" project, when students graduate, can also be added to the college's selection criteria. If any class has completed the corresponding indicators, the college will give corresponding spiritual or material rewards. This is also a kind of Graduation Education for graduates, and it seems that the work has a beginning and an ending. In addition, the results of the college's advanced class group preliminary competition should also be planned in advance, and the corresponding quota should be taken out for adjustment, so as to encourage the hard-working class group to be better, and urge the backward class collective to catch up.

4.3 Reduce unnecessary bonus items. In the network media, there is often a corresponding knowledge quiz, students should be encouraged to participate, after winning the prize, they are required to add points in the group preliminary contest of the advanced class. The final first place of the college should be recommended to participate in the competition of the top ten classes. The bonus items of the college should closely follow the indicators of the University and reduce unnecessary bonus items. On the one hand, it reduces the workload of students, but also improves the quality of the scores of each class. Because according to the opinion, the scores of the preliminary contest and the final match should be part of each other, which will result in that if the score of the preliminary competition is very high, there will be no big change in the final, because the score of the preliminary contest will be several hundred, while the score of the final is only a few dozens. Once the score is opened, it is difficult to recover. That is to say, it will affect the enthusiasm of the lower class, and also affect the competitiveness of our recommended class.

5.SUMMARY

Class group is the carrier for students to spend college time together. A good class group not only benefits students, but also improves the management level of our college. We should constantly improve the rules and regulations in the process of student management, so that there are rules to follow for student work and make the management more scientific. The formulation of rules and regulations should take into account the actual situation of students, not only pay attention to the results, but also to the process. Student management is a complex task. If we pay attention to the construction of class collective, it will bring benefits to our work.

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Application of Green Chemical Technology in Fine Chemical Industry

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Abstract: With the progress and development of society, China's science and technology is also in constant development. The progress of science and technology has promoted the development and progress of various fields and industries. At the same time of technological innovation and development, people also have to face the problems of resource consumption and environmental pollution. In recent years, China has advocated the strategy and principle of sustainable development. In order to achieve steady economic growth in the future, dealing with environmental problems is the key to development. Around the theme of green, environmental protection and energy saving, technological innovation has become the yardstick of China's development. Green chemical technology is also developed under such advocacy. At this stage, this technology will also be the key to lead the development of chemical industry. From the perspective of the application of green chemical technology in fine chemical industry, this paper aims to promote the sustainable development of chemical industry.

Keywords: Green chemical technology; Fine chemical industry; Application

1. INTRODUCTION

In China's economic composition, the chemical industry accounts for a relatively high proportion, which has become an important part of national development. Chemical industry is closely related to people's life and other industries. With the innovation and continuous development of science and technology, many new technologies are applied in the production and manufacturing of chemical industry. On the one hand, the application of science and technology in chemical industry solves the problem of driving force for the development of chemical industry. On the other hand, it solves the damage and influence of chemical industry development on environment and surrounding ecology. The emergence of green chemical technology solves the problem of resource waste in chemical industry, and promotes the development of chemical enterprises in China towards the direction of green, fine and sustainable development.

2. BASIC CONTENTS OF GREEN CHEMICAL TECHNOLOGY

2.1 Zero emission and pollution-free utilization

Traditional chemical industry will produce a lot of harmful gases and wastes in the production chain. These gases and wastes are discharged into the nature without effective treatment, which seriously destroys the balance

of natural ecology and brings irreparable great damage to the surrounding ecology. With the increase of people's awareness of environmental protection, the chemical industry with serious pollution has been actively developing and innovating green chemical technology and applying it to fine chemical industry. That is, in all aspects of the chemical production chain, make its products meet the specifications of green production. The generated harmful gases and fertilizers are fully absorbed and utilized, so as to achieve zero emission in the whole chemical production process [1].

2.2 Make full use of resources and follow sustainable development

In recent years, after the implementation of environmental protection concept, the chemical industry has applied green technology to fine chemical production. In this process, people may pay too much attention to or highlight the green and pollution-free problems of chemical production process, and thus may neglect the importance of chemical production efficiency. Make full use of raw materials to achieve no waste and efficient production results. This requires the relevant enterprises to take into account the two important aspects of green production and efficient production, ensure people's health and environmental stability at the same time, make full use of resources, and follow the enterprise goal of sustainable development.

2.3 Green NEW

The purpose of green chemical technology is to make the chemical production process pollution-free, zero emission, no harm. Only by completing this strategic goal can we achieve sustainable development according to the requirements of the state for enterprises. In order to accomplish this feat, the newly developed chemical technology in recent years has a common feature - green. For example, the new emerging membrane separation technology and new biological fermentation technology are non-toxic, harmless and pollution-free catalyst production technology [2].

3. BASIC CONTENTS OF FINE CHEMICAL INDUSTRY

3.1 The scale of the unit is small

Compared with ordinary chemical equipment and devices, the scale of the devices used in fine chemical production is smaller. However, it is characterized by simple and convenient operation. China's development in fine chemical enterprises is relatively late, but with the increase of foreign market demand for them, the scale of some refined products has also gradually increased [3].

3.2 Various types

The development and innovation of science and technology in modern society add vitality to the whole society and stimulate the development power of modern enterprises. With the application of science and technology in fine chemical industry. As a result, the production of different products of fine chemical technology increased. At the same time, the increase of fine chemical products has enriched the whole social market environment. Different products adopt the same technology, but their specifications are different. In the future, the variety of fine chemical products will be more and more diversified.

3.3 High technical precision

Chemical industry is closely related to people's daily life and production. The research and development of chemical products should meet the market demand. According to the market demand, expand the production scale, and shorten the new product development cycle, at the same time, we should speed up the product development speed, through these operations to reduce the cost of product research and development. But the reality is that the new product R & D cycle is long, requiring a lot of raw materials and costs. The higher the technical precision, the more advantages of personal development.

4. APPLICATION OF GREEN CHEMICAL TECHNOLOGY IN FINE CHEMICAL INDUSTRY

4.1 Micro chemical technology

From the literal sense, the micro chemical technology is different from the traditional sound. Micro chemical technology is a kind of equipment which uses micro operation to manufacture. Micro chemical technology is one of the fine chemical technology. It has developed a complete set of chemical micro processing equipment by using micro sensors, actuators and various structures. The key point of its application lies in the use of micro mixing, reaction and other technologies.

4.2 Green catalytic technology

In the chemical production process, the chemical production process needs to mix different substances together to produce chemical reactions under certain conditions to obtain new substances. Catalyst is essential in chemical production, which can accelerate the speed and intensity of chemical reaction between substances. The emergence of green catalytic technology avoids the occurrence of chemical reaction process and reduces the occurrence of harmful gases and wastes. Similar to solid acid-base catalyst and nano catalyst, the traditional catalyst is further strengthened, which not only realizes the high efficiency of the production process, but also has the rationality of the production process.

4.3 Green separation technology

Chemical plant is the key of chemical industry production and manufacturing. No matter how the raw materials and products are optimized, the final form of chemical production is chemical plant. Through the continuous optimization and improvement of chemical plant, the efficiency of chemical production can be achieved. For

example, in modern chemical production, chemical devices can be used to realize green separation technologies such as fluid extraction, membrane separation and resin adsorption. This green separation technology is characterized by low pollution, low energy consumption and high efficiency. Nowadays, green separation technology is widely used in the fields of medicine, pesticides, spices and additives.

4.4 Computer molecular separation technology

Combining computer information technology with fine chemical industry. People can understand the performance, internal structure and processing law of molecules in products through computer information technology. The innovation of products can meet the requirements of green, efficient, environmental protection and sustainable development. The computer molecular separation technology can absorb and utilize the waste and waste gas in the production process, and finally realize pollution-free.

4.5 Biochemical technology

Biochemical technology is a kind of green chemical technology, which is used in the production of ethanol, acetone and other basic chemical raw materials. At the same time, it is also used in pesticide, antibiotics and other agricultural production process.

5. CONCLUSION

Generally speaking, the development of science and technology has promoted the progress of chemical industry. People should pay attention to environmental protection while obtaining economic benefits. Only by coordinating the relationship between good people and nature can the sustainability of future chemical development be ensured.

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Research on The Coupling Development Path of Cross Border Logistics and Cross Border E-Commerce

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Abstract: In recent years, cross-border e-commerce has gradually risen and developed rapidly. At present, its scale has exceeded 10 trillion yuan. The rapid development of cross-border e-commerce has also led to the rapid rise and development of other related industries, such as data analysis, logistics and distribution, among which the most profound impact on cross-border Logistics, in fact, the current cross-border e-commerce is fast. Under the background of rapid development, logistics distribution has become one of the difficult problems in cross-border e-commerce industry. Therefore, how to effectively promote the coordinated development between cross-border e-commerce and cross-border logistics has become one of the practical issues to be solved in the process of cross-border e-commerce development.

Keywords: Cross border e-commerce; Cross border logistics; Coupling development; Path

1. INTRODUCTION

In recent years, with the further development of international trade, the state is also actively introducing various favorable measures to promote the development of cross-border e-commerce. The purpose is to further support the traditional foreign trade enterprises to realize transformation and upgrading by means of Internet channels and carriers. It is expected that in the future, the new trade mode represented by cross-border e-commerce will occupy an important share in China's import and export trade [1]. At the same time, the rapid development of cross-border e-commerce has also led to the rapid development of cross-border logistics. How to better promote the coordinated and benign interaction between cross-border e-commerce and cross-border logistics will be an important issue in the future development of cross-border e-commerce.

2. CROSS BORDER E-COMMERCE AND CROSS-BORDER LOGISTICS

The so-called cross-border e-commerce refers to an international commercial activity in which different trading entities belonging to different customs areas, take various e-commerce platforms as carriers, conclude transactions and settle transactions on this basis, and exchange commodities through cross-border logistics. In terms of transaction types, cross-border e-commerce can be mainly divided into B2B, B2C and C2C, in which B2C and C2C directly target the final consumers, which is also

known as cross-border online retail; from the perspective of transaction subject category, cross-border e-commerce is mainly divided into three types: platform, self-employed and hybrid; from the perspective of transaction mode, it can be divided into two types: cross-border import and cross-border export. In recent years, with the continuous improvement of people's living standards, the further popularization of the Internet and the further maturity of cross-border logistics system, online shopping has become a new way of consumption. The essence of cross-border e-commerce is to establish a relatively free and universal global trading platform through the Internet platform. With the development of cross-border e-commerce, it is expected that cross-border trade will become the mainstream in the future.

Cross border logistics is a new form of logistics accompanied by the emergence and development of cross-border e-commerce. The relationship between them is complementary. The main purpose of cross-border logistics is essentially the same as traditional logistics, which is to trade goods across borders. Under the current background, cross-border logistics must actively adapt to the development trend of cross-border e-commerce and actively share resources and technologies. Sharing and strategic coordinated development can realize the benign interactive development between the two.

3. ANALYSIS OF THE DEVELOPMENT STATUS OF CROSS-BORDER E-COMMERCE AND CROSS-BORDER LOGISTICS IN CHINA

Although China's cross-border e-commerce started relatively late in the world, thanks to the rapid development of Internet technology and the vast domestic market in recent years, cross-border e-commerce has developed rapidly. According to the relevant data of the Bureau of Commerce, China's cross-border e-commerce transaction volume reached 7.5 trillion yuan in 2017, with a year-on-year growth of 19%. In 2018, the number reached 8.8 trillion yuan, with a year-on-year increase of 17.3%. It is expected that this year By the end of the year, the transaction volume of China's cross-border e-commerce will reach 12 trillion yuan, and the penetration rate will reach 37.6%. Especially in 2018, China's cross-border e-commerce will continue to gain favorable policies. The successive promulgation of the e-commerce law and related cross-border e-commerce policies have greatly standardized and promoted the development of China's cross-border e-commerce. At the same time, with

the continuous improvement of China's consumer purchasing power, the cross-border e-commerce market Domestic demand is still very large, which also provides more development potential for the development of cross-border e-commerce enterprises.

With the rapid development of cross-border e-commerce in China, the rise and development of cross-border logistics must be stimulated and promoted. In recent years, with the development of cross-border e-commerce in China, the market of cross-border logistics industry in China has also increased year by year. According to the relevant data of ECOSOC, the market scale of China's cross-border logistics industry has reached 2.62 trillion yuan in 2019, with a year-on-year increase of 16.6% The business volume accounts for 2.2% of the total business volume in China, which has a huge development space [2]. At the same time, China's cross-border logistics enterprises are also accelerating the layout of overseas automated warehousing centers, the construction of efficient service network covering the world and the construction of international intelligent logistics management system. They have initially possessed the international competitive advantages of intelligence and intensification. At the same time, in this process, China's cross-border e-commerce and cross-border logistics supply Therefore, promoting the coupling development of cross-border logistics and cross-border e-commerce will become the top priority of cross-border industry development in China in the future.

4. RESEARCH ON THE COUPLING DEVELOPMENT PATH OF CROSS-BORDER LOGISTICS AND CROSS-BORDER E-COMMERCE

Although the prospect of cross-border e-commerce is very bright, it must be supported by a modern logistics system matched and integrated [3]. Therefore, how to promote the coupling development between cross-border logistics and cross-border e-commerce, in order to better promote the connotative development of China's cross-border export trade, has become one of the focuses of cross-border trade industry. The author believes that the following aspects should be focused on to promote the coupling development of cross-border logistics and cross-border e-commerce:

4.1 Adhere to the system first and optimize the policy and regulation system for the coordinated development of cross-border e-commerce and logistics

At the same time, the synergy effect between cross-border e-commerce system and cross-border logistics in China has not been enough in recent years, but the synergy between cross-border e-commerce and cross-border logistics is still insufficient Therefore, in order to further promote the coordinated development of cross-border e-commerce and logistics, relevant departments of the state must earnestly strengthen the existing problems and future development direction in the collaborative development process of cross-border e-commerce and cross-border logistics in China, and further strengthen the system innovation, starting from the relevant laws and regulations and policy-making, etc The political situation and other departments should strengthen cooperation,

continue to deepen the reform of "release, management and service", further simplify the business licensing procedures of cross-border logistics enterprises, further optimize and improve the relevant matters of cross-border logistics enterprises, realize online processing, and strengthen the supervision during and after the event; it is necessary to strengthen the policy support for industrial support, and gradually guide cross-border logistics enterprises to gradually realize commodity pricing and express service We should further improve the data sharing among cross-border logistics enterprises, build a data sharing mechanism, and gradually improve the relevant rules of data protection and open sharing between cross-border e-commerce and cross-border logistics On the basis of consumer personal information security, gradually encourage and guide cross-border e-commerce platforms and express logistics enterprises to carry out data sharing and data exchange, so as to jointly improve the distribution efficiency; gradually improve the institutional constraints, further play the self regulatory role of cross-border e-commerce, especially the cross-border Logistics Industry Association, and accelerate the introduction of relevant industry self-discipline conventions We should strengthen the main responsibility of cross-border logistics enterprises, further improve the management mode of collaborative governance, and steadily improve the management level of cross-border logistics enterprises.

4.2 Adhere to planning guidance and accelerate the improvement of cross-border e-commerce and cross-border logistics infrastructure

To promote the coordinated development of cross-border e-commerce and logistics, relevant infrastructure construction must be put in an important position. According to the characteristics of cross-border e-commerce including omni-channel, multi platform and online and offline integration, cross-border logistics enterprises should be scientifically guided and standardized to accelerate infrastructure construction, and strive to build a cross-border logistics service system suitable for the rapid development of cross-border e-commerce [4]. Under the guidance of the relevant policies of relevant national departments, all localities should focus on the development and improvement of cross-border logistics system according to the local actual location advantages. For example, for some southwest coastal cities, due to the complicated domestic and international environment in recent two years, especially the pressure of epidemic prevention, cross-border E-commerce and cross-border logistics development In this context, the waterway, air and road transportation have been blocked. In this context, we can actively expand the five cross-border routes, accelerate the development of cross-border container transport, such as cross-border container transport and cross-border container direct transport trains between China and Vietnam, so as to realize the normal operation of cross-border e-commerce and cross-border logistics, especially railway transportation It has the advantages of less natural contact and low cost. In the context of the new epidemic, we

should take advantage of this natural advantage to encrypt cross-border freight trains, and give corresponding policy support in this process, give full play to the advantages of international logistics companies, strive to broaden and stabilize growth channels, and promote the coordinated development between cross-border e-commerce and cross-border logistics.

4.3 Adhere to win-win cooperation and actively build cross-border e-commerce logistics cooperation alliance
At present, cross-border e-commerce has become a new growth point of international trade [5]. Novel coronavirus pneumonia has been developing rapidly in recent years. Despite the impact of the new crown pneumonia epidemic this year, the development trend of cross-border customer service has weakened, but there will still be a very broad space for development in the future. However, we should see that the development bottleneck of cross border logistics has become a prominent short board for the development of the industry while the cross-border electricity supplier continues to boom. Logistics problems such as being difficult to be effectively guaranteed need to be solved effectively. Logistics has become a key factor restricting the development of the entire cross-border e-commerce. Therefore, to promote the coupling development of cross-border logistics and cross-border e-commerce, we must first focus on solving the problems existing in the development process of China's cross-border logistics industry, and actively seek countermeasures is the current primary task Under the circumstances, governments at all levels should actively cooperate with relevant industry organizations, actively develop cross-border e-commerce logistics cooperation alliance with relevant organizations according to the principles of cooperation and mutual benefit, and strengthen cross-border logistics policy communication, market docking, personnel exchange and collaborative distribution among members by actively integrating cross-border logistics resources and platforms And other aspects of in-depth cooperation to achieve the development of the epidemic situation. City municipal government one belt, one road one belt, one road and one belt, one road, and other related industries and organizations in 2015, Lanzhou municipal government actively launched the "one belt" cross border e-commerce logistics cooperation alliance. It actively organized and organized a communication and cooperation bridge between the national cities and social organizations along the line along the way, and built up multi-level, diversified, and diversified. One belt, one road, is to promote the coordinated development of cross border logistics enterprises. It will develop the cross-border e-commerce logistics industry as an important support for the "one belt and one road" and a strong driving force for regional economic development, and further accelerate the coupling development of cross border logistics and cross-border electricity providers. At the same time, the organization also released the famous " The Lanzhou declaration has one initiative to jointly promote one belt, one road cross border e-commerce logistics industry development. It also provides beneficial reference and

thinking for the development of cross border logistics and promoting the coordinated development of cross-border logistics and cross-border electricity suppliers.

4.4 Adhere to the demonstration drive and strengthen the demonstration and leading role of cross-border logistics backbone and leading enterprises

In order to promote the transformation and development of cross-border logistics and improve the quality and efficiency under the background of the new era, and vigorously promote the coupling development between cross-border logistics and cross-border e-commerce, we must pay attention to adhering to the demonstration drive, and strengthen the demonstration and radiation role of cross-border logistics backbone and leading enterprises. All localities should actively encourage and support the development of large-scale cross-border logistics backbone enterprises by introducing various supporting policies according to their geographical advantages and economic scale. They should focus on supporting the development of node cities and gradually forming trade and logistics centers dominated by cross-border e-commerce, and attract a number of platform enterprises and logistics enterprises actively participating in cross-border trade and cross-border circulation of commodities Actively participate in the planning and layout of cross-border logistics to make it a new force of cross-border logistics. Especially in this regard, it is necessary to actively support cross-border e-commerce logistics enterprises such as tmall global and Jingdong international to actively develop overseas warehouse logistics service mode, which is one of the biggest changes and development directions of cross-border E-commerce logistics in recent years. The mode of overseas warehouse is essentially like the front-end warehouse service mode of domestic retail. It is to arrange the relevant goods which are not available for sale in advance to the overseas warehouse closer to the overseas consumers. After receiving the corresponding order from the consumers, the overseas warehouse can directly send the goods to the consumers, to achieve the delivery efficiency of cross-border trade services and after-sales service is closer to the local sales level and improves the purchasing experience of consumers. For large-scale cross-border logistics enterprises, actively building overseas warehousing logistics can effectively help cross-border e-commerce further reduce logistics costs, open international markets, and improve consumer experience. At the same time, it is also conducive to enterprises to adjust relevant business strategies and business scale in a timely manner according to changes in the international market, so as to better promote domestic logistics and cross-border logistics It is more noteworthy that large backbone enterprises should be encouraged to actively layout the logistics service mode of overseas warehouses as early as in the 2017 government work report. It is emphasized that we should actively encourage the innovation of business models, support enterprises to build several overseas warehouses of export industries, better improve cross-border logistics services, and promote cross-border e-commerce and cross-border e-

commerce the healthy development of environmental logistics industry.

5.CONCLUSION

In short, under the background of the in-depth development of Global trade and the rapid development of cross-border e-commerce, it has become a realistic task for governments at all levels and industry organizations to solve the bottleneck problem in the development of cross-border logistics and further promote the coordinated and benign development between cross-border e-commerce and cross-border logistics. In the process of promoting the coordinated development of cross-border e-commerce and cross-border logistics, all localities should focus on solving the outstanding problems existing in the process of cross-border logistics development. In addition, they should actively build cross-border e-commerce logistics cooperation alliance and optimize the policy and regulation system for the coordinated development of cross-border e-commerce and logistics through system construction, planning guidance, win-win cooperation and demonstration drive. In addition to improving the infrastructure of cross-border e-commerce and cross-border logistics, actively building cross-border e-commerce logistics cooperation alliance, and strengthening the demonstration and leading role of cross-border logistics backbone and leading enterprises, we should further improve the logistics coverage network, strengthen the understanding and mastery of customs related laws and regulations of various countries, and strengthen the training and transportation of cross-border logistics professionals. To promote the further development of cross-border logistics in the direction of supply chain and platform service, and to establish an integrated cross-border e-commerce logistics system.

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Research on The Path of Rural Public Sports Service in Shandong Province

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Abstract: With the continuous development of China's economy and science and technology, people's living standards have been gradually improved, and they also focus on the spiritual civilization of life, especially physical exercise has been widely concerned by people. And the government is also from the sustainable development strategic planning to explore a well-off society, not only from the economic promotion, but also to improve the physical quality of rural people, only in this way can we achieve real sustainable development in China. This paper discusses the construction plan of rural public service system in Shandong Province, the role and national policy of rural public sports service in Shandong Province, the reform and innovation of rural public sports service policy, the main body of rural public sports service policy implementation and the ways of rural public sports service implementation Path research puts forward personal views.

Key words: Shandong Province; Rural areas; Public Sports; Service path

1. THE PLAN OF RURAL PUBLIC SERVICE SYSTEM CONSTRUCTION IN SHANDONG PROVINCE

Based on the core values of China's socialist construction, we should not only meet the needs of people's daily life, but also find an entry point from their spiritual civilization level, so as to provide people with a more convenient and sound sports service system, and also provide various supplies of sports services. In the path of realizing a well-off society for all, the construction of sports services is required for education, agriculture and public institutions, and these sports facilities should be provided for the people in the whole society. After the concept of national fitness was put forward, the public facilities of fitness service have been built in various regions, and a large number of people serve as volunteers to help people and guide them how to keep fit and carry out sports activities. In the community, through the promotion of Taijiquan, radio exercises and yangko dance, the people's interest in sports can be improved. In addition, provincial and municipal governments in various regions should also establish inspection and inspection teams to popularize sports knowledge among people and test the feasibility and compliance of public sports services [1].

2. THE FUNCTION AND NATIONAL POLICY OF RURAL PUBLIC SPORTS SERVICE IN SHANDONG PROVINCE

The construction and development of rural public sports service not only affects people's sports consciousness, but also promotes the rural economic construction in China.

Because under the support of the policy, all regions have established relevant service stations and service institutions, which are the important foundation for the construction of rural public sports service, so they are really into people's lives and are always concerned about. At present, there are still many deficiencies in the development of sports in Shandong, especially the imbalance of construction. Moreover, there are some problems such as the low enthusiasm of people to participate and the single sports activities, which have a restrictive effect on the construction of public sports services. In the promotion of national fitness, both speed and efficiency will determine the level of people's physical health in China, and can effectively promote our culture. It is an important strategic measure to guide people to actively participate in sports activities and improve their physical quality. Under the leadership of the CPC Central Committee, relevant plans have been put forward for the construction of sports public service system in various regions, and diversified service systems have also been built for different regions and groups, which can provide greater impetus for the construction of sports civilization society in China [2].

3. THE REFORM AND INNOVATION OF RURAL PUBLIC SPORTS SERVICE POLICY IN SHANDONG PROVINCE

In the process of construction and promotion of sports public service in Shandong Province, we need to start from the current construction situation, and then analyze and innovate the reform. The construction needs strict supervision and the appearance of the form problem, because there are differences between the rural people and the people in the city, and the sports project selection will also highlight the differences. For example, the construction of basketball courts in rural areas is basically carried out by young people. Boys are more than girls. This kind of sports is not very attractive to the elderly. This highlights the rural public sports service construction must be practical and realistic combination of the crowd, can not be a sports facility directly summed up all the crowd, need to take into account the diverse needs of people. According to the relevant survey data show that most of the rural people like sports such as yangko dance, tug of war, basketball and kite flying, etc., then it can be concluded from the analysis that rural people pay more attention to some relatively light sports. Based on this, the governments in Shandong Province should follow the wishes of farmers to build service projects, and then organize them to carry out some friendship competitions, which can maximize their

enthusiasm for sports, and can also put the core values of lifelong sports into their hearts, so as to realize the construction of sports public service in Shandong Province.

4. THE MAIN BODY OF RURAL PUBLIC SPORTS SERVICE POLICY IMPLEMENTATION IN SHANDONG PROVINCE

For this project should be implemented in different cities, townships, villages and other regions, from a broad perspective, the subject of service is the grass-roots people, they have the greatest role in the development of China's sports cause, and these can be reflected in some policies and regulations issued by the government, under the guidance of the government, people can deeply understand the state's influence on sports Their care, and then gradually change the traditional thinking, corresponding to the call of the government, actively participate in the sports service system. However, it also needs to be constrained by government laws and regulations to prevent and control corruption by leaders in some regions. At present, the implementation of sports public service in Shandong Province is in the stage of rapid rise, and there is great potential. Then the governments of various regions should also start from the management, flexibly construct, and publicize, and do not use the traditional way to realize the service, which will only make the farmers feel disgusted.

5. WAYS TO IMPLEMENT PUBLIC SPORTS SERVICE IN RURAL AREAS

In the new period sports work guidance issued by the State Council, it is pointed out that the service system of the construction group in China must start from three aspects: the first is the selection and construction of sports venues. It must be built in a geological environment convenient for the masses of the people. Basically, it is most appropriate to be near social service organizations or village committees. This principle of proximity can let people see the future Greatly improve the enthusiasm of participation, and then facilitate their participation. The second is sports activities, which requires the community

to establish a good physical testing of people, and then according to the local people's sports preferences survey to select the established projects, and do a good job in publicity. The third aspect is to diversify sports activities. We need to adhere to the people-oriented construction concept, build venues and set up projects according to the national outline, and expand the scope of service to the maximum [3].

6. CONCLUSION

To sum up, in the process of social development and construction, it is found that Chinese people are basically satisfied with their material life, and now they pay more attention to their health. From the living conditions of rural farmers in Shandong Province, many people are interested in morning running, playing basketball, yangko dance and other physical exercises, but because there is no organization and special venues, their interests are also limited. But now, after the formation of the public sports system launched by the national government, local governments began to focus on the construction of service stations, sports venues, sports facilities and the organization of sports activities, which also represents that China is about to enter the era of national fitness.

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On the reform of physical education in Higher Vocational Colleges from the perspective of Multimedia

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Abstract: With the continuous progress of information technology, it is widely used in various fields in China, and has contributed to the economic development. Among them, it has been widely used in education, improving the quality of teaching, and students are also willing to accept multimedia teaching. At present, the physical education teaching mode of higher vocational education is solidified, which cannot arouse students' interest. The urgent task is to provide students with different classroom atmosphere by combining with multimedia, to realize the teaching purpose of physical education. Combined with the connotation of multimedia technology and the role of higher vocational physical education teaching, this paper discusses the new ideas of Higher Vocational Physical Education Teaching Reform from the perspective of multimedia, hoping to provide some constructive suggestions for it.

Keywords: Multimedia vision; Higher vocational education; Physical education teaching; Reform ideas

1. INTRODUCTION

With the continuous progress of science and technology, all fields of social life also enjoy the convenience brought by science and technology, which does not provide a lot of advantages for the current development. The use of multimedia provides a total of effective teaching methods for China's education. Our country's higher vocational physical education has been solidified, at this stage, we should start to reform, innovate, and optimize. But for now, the mode of higher vocational physical education has a great relationship with examination-oriented education, which has caused trauma to students' enthusiasm for sports, thus greatly reducing the hard work of Teachers. If multimedia is applied to higher vocational physical education, it will be an important stage to improve students' sports concept and has great significance.

2. CONNOTATION OF MULTIMEDIA TECHNOLOGY

Multimedia technology is a kind of scientific and technological means derived from information technology. The most important thing is to optimize the expression. In detail, it is to use digital technology to synthesize information such as text, data, video and pictures, and transmit relevant content to the audience through the screen. However, these information become vivid through the audience's senses, and multimedia also contains data. It is an important technology in the

development of information technology. The use of multimedia in higher vocational physical education can kill two birds with one stone. It can not only assist teaching and provide more new teaching modes for teachers, but also enrich the diversity of courses and improve the classroom atmosphere, to stimulate students' sports ability.

3. THE ROLE OF MULTIMEDIA IN HIGHER VOCATIONAL PHYSICAL EDUCATION

3.1 Strengthen the technical nature of physical education teaching in higher vocational colleges

In the traditional higher vocational physical education teaching process, teachers generally use the demonstration form of classroom mode, teachers only use oral explanation and action analysis to let students master the movement posture, but the actual situation restricts the development of students, after all, students with poor understanding ability can hardly understand the teachers' good intentions, which has a serious impact on the teaching quality. If multimedia technology is used in the future physical education teaching, then we can get twice the result with half the effort. For example, when explaining a set of sports, teachers can look for videos on the Internet, and students can quickly understand their correct actions through sound, animation, and movement. The diversification of classroom display also improves the teaching quality and interest will be strengthened [2].

3.2 Improve the enthusiasm of students in physical exercise

Under the influence of examination-oriented education, teachers and parents are still old-fashioned and do not realize the importance of sports. Although in the university stage, there is still a phenomenon of "attaching importance to study and neglecting physical education". Naturally, students' interest in sports will be low. The significance of higher vocational physical education reform is to attach importance to students' interest in sports, hoping to achieve the purpose of physical exercise through sports and reduce sub-health population. The use of multimedia teaching can liberate the single teaching mode, adopt more novel teaching methods, and let students experience "happy sports class".

3.3 Greatly expand students' horizons

Higher vocational physical education teaching process can not keep pace with the times, the classroom time is limited, but the teaching content is too much, the general time and content can not be coordinated, so lead to the tension of lesson preparation, students can not enjoy the

charm of sports. And the teachers in the school have been engaged in the education industry for many years. Although they have rich experience, the sports system is fixed, and some new contents and knowledge points can not effectively join the inherent system, resulting in low teaching quality and backward teacher mode. If the combination of multimedia physical education, then you can contact with advanced ideas, let students understand more interesting sports knowledge, at the same time, teachers can also use multimedia to enrich their own professional quality, in order to improve the teaching level and achieve classroom innovation.

3.4 Help students understand the importance of physical exercise

Physical exercise is particularly important for students, which can improve their physical resistance and liberate the pressure of study. However, at this stage, students do not put physical exercise in the arrangement of daily life, and their attitude in class is perfunctory, which can not achieve the purpose of physical education class, and the teaching task can not be completed naturally. Since students don't realize the importance of physical exercise, teachers should shoulder the responsibility, guide students correctly, use multimedia teaching in the classroom, develop a courseware about "physical exercise and physical health", look for videos to explain the purpose of physical education for students, and let students realize the significance of sports.

4. NEW IDEAS OF HIGHER VOCATIONAL PHYSICAL EDUCATION REFORM FROM THE PERSPECTIVE OF MULTIMEDIA

4.1 Change the physical education teaching mode and enhance students' learning enthusiasm

In the process of traditional physical education teaching, the classroom is loose and casual, students are perfunctory, the teaching task can not be completed at all, and teachers also shoulder the responsibility, making the physical education discipline become a "disaster area" for students. The use of multimedia teaching is a good way, for example, in the warm-up exercise process, teachers can cooperate with music to guide students to participate in the classroom, creating a "democratic" classroom atmosphere.

4.2 Cultivate students' autonomous learning ability through multimedia teaching

The most characteristic function of multimedia is video playing. Teachers should teach students in combination with video playing mode. For example, some actions that are easy to make mistakes can be analyzed by video, to simplify teaching. In the traditional teaching process, physical education teachers will use the way of personal demonstration to let students achieve the purpose of learning, which often leads to the situation that they can

not take care of the students, but also restricts the development of sports. Nowadays, the use of multimedia can solve this problem. Teachers solve their own problems, and students can follow the video through the large screen, which greatly improves the efficiency of Teaching [3].

4.3 The teaching contents should be diversified to enhance the intuitiveness of teaching

In the traditional physical education teaching, the general classroom mode is simple and boring, which leads to the students' disgust to sports, and the interest is gradually exhausted, so the quality of physical education teaching is declining. But at this stage, the use of multimedia teaching to expand the scope of the classroom, students' interest gradually increased, and students can intuitively understand sports through the screen, not only enrich the students' vision, the relationship between teachers and students will be further.

Just as some male students like playing basketball, the teacher can achieve the purpose of arousing students' interest by editing the classic clips of the game; then the female students love beauty, the teacher will seize this feature and integrate into the physical education classroom, such as those movements can reduce weight, those movements can be increased, etc., so as to improve the activity of the class.

5. CONCLUSION

To sum up, it is a brief discussion on the research of new ideas of Higher Vocational Physical Education Teaching Reform from the perspective of multimedia. Physical education is very important to the cultivation of students. At present, most of the domestic students are in sub-health state, with low physical quality and often unable to resist the flu. On the other hand, college students are under great pressure. They should not only master professional knowledge, but also bear the pressure of practice and employment. Regular physical exercise can relieve the psychological depression and make students in a state of mental and physical health.

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Research on The Performance Evaluation Index System of Innovation and Entrepreneurship Education in Applied Universities

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Abstract: In order to promote social progress and development and improve China's competitiveness in the international community, we should start from training innovative talents and improving China's soft power. Therefore, cultivating innovative and entrepreneurial talents is the development goal of application-oriented universities. Among them, the evaluation system of innovation and entrepreneurship education performance of Application-oriented Colleges and universities plays a crucial role in promoting the development of application-oriented universities. Therefore, how to construct the education performance evaluation system of innovation and entrepreneurship in Application-oriented Colleges and universities has become the direction of thinking and research. This paper will focus on the characteristics of application-oriented universities, analyze the status quo of the performance evaluation index system of innovation and entrepreneurship education in application-oriented universities, and carry out research and Exploration on the construction of performance evaluation index system of innovation and entrepreneurship education in application-oriented universities.

Key words: Application Oriented University; Innovation and entrepreneurship; Performance evaluation index

1.THE MAIN CONTENTS OF INNOVATION AND ENTREPRENEURSHIP EDUCATION IN APPLIED UNIVERSITIES

The talent cultivation and goal of Application-oriented Colleges and universities have their unique positioning. Compared with the junior college, the application-oriented colleges and universities pay more attention to strengthening the basic education of students. Compared with the undergraduate course, the teaching objectives of the application-oriented universities are mainly reflected in the cultivation of applied skills, and more emphasis is placed on the cultivation of students' practical ability. The teaching objectives of application-oriented universities are very clear, mainly committed to training high-quality talents with strong professional skills and practical skills, and contribute to the development of society [1].

2. THE CHARACTERISTICS OF INNOVATION AND ENTREPRENEURSHIP EDUCATION IN APPLIED UNIVERSITIES

2.1 Resource input

Compared with other ordinary colleges and universities, application-oriented colleges and universities have no obvious advantages in resource investment, especially in

private application-oriented colleges and universities. Therefore, in terms of school environment, teaching conditions and teaching staff, application-oriented colleges and universities are still relatively backward compared with other ordinary colleges and universities, and there is a big gap. Most of the funding sources of Application-oriented Colleges and universities come from themselves, and there are not many corresponding policies to support them. The sources of alumni and society are not stable, and the sources are less. Therefore, the school should use the limited teaching funds to allocate teaching resources efficiently, and ensure the efficient utilization of relevant resources when investing in innovation and entrepreneurship education resources.

2.2 Personnel training objectives

Cultivating students' practical ability is the goal of Application-oriented Colleges and universities. Therefore, when carrying out innovation and entrepreneurship education, we should pay attention to the integration of innovation and practical ability, so as to achieve the talent training goal of innovation and entrepreneurship education in Application-oriented Universities [2].

2.3 Development results

Compared with other universities, application-oriented universities also have some unique advantages in some aspects. For example, the application-oriented colleges and universities of engineering and economics and management, although they are subject to the limited teaching conditions and low starting point, they pay more attention to the cultivation of students' innovative thinking and exploration spirit. Teachers pay attention to the combination of disciplines and innovative thinking when teaching. Therefore, students' practical ability and problem-solving ability are relatively strong, and they are innovative and entrepreneurial. It is also ahead of ordinary colleges and universities and has made certain achievements. For example, Anhui Xinhua university is the leader of Application-oriented Colleges and universities. It has made certain achievements in innovation and entrepreneurship education early, and won the national honor, and was rated as the "university where the innovation and entrepreneurship training plan for college students is implemented" [3]. Among them, many excellent students have also made brilliant achievements in various competitions and have national invention patents.

3. THE EVALUATION STATUS OF INNOVATION

AND ENTREPRENEURSHIP EDUCATION OF APPLICATION-ORIENTED COLLEGE STUDENTS

The development of ordinary colleges and universities is earlier, the evaluation system of innovation and entrepreneurship education has been formed, application-oriented colleges and universities are subject to various factors, the performance evaluation system of innovation and entrepreneurship is still in the development stage, and is not perfect, the situation at this stage is shown in the following points.

3.1 The evaluation objective is not clear enough

First, there are still some controversies about the evaluation objectives of innovation and entrepreneurship education in Application-oriented Colleges and universities at this stage. Some people think that the evaluation should be based on the number of entrepreneurs and the number of entrepreneurial enterprises. The other part thinks that innovation and entrepreneurship should focus on innovation, so it should be evaluated around the awareness and ability of innovation and entrepreneurship [4]. In addition, there are some views that should be based on the performance of students in school, or the entrepreneurial achievements of students in society. These views are not consistent, so the evaluation objectives are not clear enough.

3.2 The evaluation object is not comprehensive

In the past, the evaluation of innovation-oriented curriculum and innovative teaching facilities is also the evaluation of students' innovative ability. Among them, there is also a more important evaluation object is teachers, teachers have an important impact on innovation and entrepreneurship education, therefore, we should improve the enthusiasm of innovation and entrepreneurship teachers for innovation and entrepreneurship education.

3.3 The evaluation index system is not perfect

There are some differences in the development speed and level of innovation and entrepreneurship education in each application-oriented university, and the characteristics of each school are also different. Therefore, there is a lack of unity in the evaluation index system, and there is no feasible standard. In the evaluation, there is a lack of evaluation from the society and relevant units, and there is little investigation about graduates after students leave the campus.

4. OPTIMIZING AND IMPROVING THE PERFORMANCE OF INNOVATION AND ENTREPRENEURSHIP EDUCATION IN APPLICATION-ORIENTED UNIVERSITIES

4.1 Construct a comprehensive and multi-level curriculum system of innovation and entrepreneurship education

With the development and progress of social economy, the demand for economic and management talents is increasing. Therefore, there are more economic and management disciplines in application-oriented universities, and their development speed is also fast. In order to improve the comprehensive practical ability of students in all aspects and promote the development of local social economy, application-oriented colleges and

universities should, according to their own actual situation and school running characteristics, start from their own advantages in economics and management disciplines, speed up the construction of their own talent reminders, so as to improve the comprehensive practical ability of students in all aspects, and better promote the development of local social economy.

4.2 Accelerate the construction of application-oriented teachers

In the training of application-oriented teachers, we should start from two aspects. The first is to train the existing teachers. Schools should provide learning platforms and training opportunities for existing teachers, so that teachers can go out to study and exercise and receive the latest vocational education and training. The practical ability of existing teachers can be effectively improved by investigating local enterprises. Second, we should continue to absorb talents, implement incentive policies to attract relevant teachers to join the school, and expand the talent team of the school, so as to promote the effective improvement of students' practical ability and innovation ability. At the same time, it is also necessary to formulate relevant regulations to encourage existing teachers and formulate relevant assessment policies to improve teachers' initiative and enthusiasm in teaching.

4.3 Strengthen practical teaching and create a good atmosphere of innovation and entrepreneurship

Practice teaching is the teaching direction that application-oriented colleges and universities pay attention to, which focuses on improving students' practical ability and practical ability. Therefore, in order to ensure the smooth development of practical teaching, it is necessary to increase the investment of funds, introduce perfect basic equipment, and strengthen publicity, to expand its publicity effect through diversified publicity means, to provide innovation and Entrepreneurship with Good foundation and scope. Finally, we can also organize relevant innovation and entrepreneurship competitions, combine regular holding with long-term fixed holding, integrate practical innovation competitions into the consciousness of students and teachers, improve students' and teachers' awareness of practical innovation and entrepreneurship, to improve the comprehensive quality of students' practical ability and cultivate talents with comprehensive innovation and entrepreneurship ability.

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Research on The Permeation Path of Moral Education in Public Physical Education in Colleges and Universities

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Abstract: Moral Education in Colleges and universities is an important way to carry out the spirit of the national ideological and political work conference and the goal of cultivating talents by virtue. With the gradual penetration of the concept of "three aspects of education" in college teaching, it has become a consensus of many teachers to infiltrate moral education in teaching and to cultivate students' moral quality while imparting knowledge and skills. Public Physical Education in Colleges and universities bears the responsibility of Cultivating College Students' sports knowledge and skills and strengthening students' physique. How to effectively infiltrate moral education in the daily teaching process and focus on Cultivating College Students' good moral quality is becoming one of the important reform directions of Public Physical Education Course Teaching in Colleges and Universities.

Keywords: College public physical education; Teaching; Moral education penetration; Path

1. INTRODUCTION

Moral education is moral education. The public physical education curriculum in Colleges and universities is not only to train students' physical quality, but also to teach them to master the necessary sports skills. More importantly, it is necessary to strengthen the ideological and political elements, strengthen the moral education of students, and complete the fundamental task of moral cultivation and cultivation of people in college physical education curriculum [1]. Physical education teachers in Colleges and universities should carry out moral education purposefully and consciously in the process of daily education and teaching, and strive to achieve fruitful educational effect.

2. ANALYSIS OF THE NECESSITY AND FEASIBILITY OF MORAL EDUCATION IN COLLEGE PUBLIC PHYSICAL EDUCATION TEACHING

It is the fundamental mission and goal of China's higher education to uphold morality and cultivate people [2]. Under the background of the acceleration of Ideological and political education, moral education in college public physical education curriculum has a distinct era background and educational value.

2.1 Infiltrating moral education into public physical education teaching in Colleges and universities is an

inevitable choice to implement the task of cultivating morality and cultivating people

On May 28, 2020, the Ministry of education initiated the "guidelines for ideological and political construction of university curriculum", which clearly requires that all disciplines and majors in Colleges and universities should deeply combine the teaching content, deeply tap the ideological and political elements, integrate moral education for students into the whole process of classroom teaching, and strive to promote the ideological and political construction of courses and give full play to the educational role of each course. Moral education infiltration in the teaching of Public Physical Education in Colleges and universities is to comprehensively speed up the pace of Ideological and political construction of public physical education courses in Colleges and universities, integrate value guidance and moral education in the whole process of students' daily sports knowledge and skills training, so that the public physical education courses in colleges and universities will eventually go in the same direction with the ideological and political courses, form a joint force, and construct the ideological and political pattern of three complete education. As a public course for all majors and students in Colleges and universities, physical education curriculum should dig deep into Ideological and political education resources and elements in daily teaching, cultivate students' basic sports knowledge and skills, and carry out moral education for students with a targeted aim, organically combine physical education and moral education, improve the quality of physical education and teaching, and help build morality and cultivate people The realization of the fundamental task.

2.2 There are abundant moral education resources in the public physical education teaching of colleges and universities

Moral education resources are an important carrier for teachers to carry out moral education for students. However, in physical education, moral elements are not explicit, but implicit in the teaching content. Therefore, teachers should take the initiative to explore and explore the moral elements contained in physical education, and purposefully carry out moral character education for students. In fact, like many other courses, the public physical education teaching in Colleges and universities contains rich moral education resources, such as the long-

term "sports spirit" of striving to be the first and winning honor for the country, the supreme motherland, unity and cooperation, tenacious struggle, and "women's volleyball spirit" which can be used by physical education teachers in their daily teaching process. Therefore, it is not only necessary but also feasible to infiltrate moral education into the teaching of Public Physical Education in Colleges and universities.

2.3 Path analysis of moral education infiltration in College Public Physical Education

In order to infiltrate moral education into students in the teaching of Public Physical Education in Colleges and universities, teachers are required to dig into the moral education resources in physical education teaching, innovate the existing teaching methods, and effectively carry out moral education for students.

2.3.1 Select typical cases to infect students

The power of example is infinite, especially the sports stars who are widely sought after by students. The power of example embodied in them is the best material for PE teachers to use for moral education. In the end, with the advent of the era of self-criticism and persuasion, teachers have been more influential in their own judgment and guidance. Therefore, teachers can make full use of this point and organically infiltrate moral education in teaching. For example, in the process of basketball teaching, when many students may have negative emotions such as depression and inferiority complex at the beginning of learning, teachers can use the example of NBA star Kobe to carry out case teaching, so that students can feel the kind of indomitable, enthusiastic, and The persistent and manba spirit, the spirit of never giving up to challenge one's own limits time and again, can infect the students through the power of this example, and cultivate their tenacity and fighting will.

2.3.2 Enhance teachers' moral education penetration ability

In the public physical education teaching in Colleges and universities, the key to moral education for students is teachers[3]. As a physical education teacher, first of all, we should change the concept of education and teaching, fully tap the potential moral elements in college physical education curriculum, and realize the organic unity of physical education and moral education. In this regard, the relevant departments of colleges and universities, such as the academic affairs office, should actively play a leading role, fully encourage physical education teachers and ideological and political teachers to establish teaching communities and other teaching organizations, carry out cooperative teaching research, effectively enhance the majority of physical education teachers in the daily process of physical education teaching moral education teaching awareness and ability, better in the physical education teaching of students to carry out moral education infiltration.

2.3.3 Optimize the teaching system of Public Physical Education

The teaching system is an important carrier of talent

training. In order to achieve the goal of moral education infiltration in the teaching of Public Physical Education in Colleges and universities, colleges and universities should actively organize relevant experts and front-line teachers to scientifically optimize the teaching system of public sports courses in Colleges and universities. It is necessary to highlight the main line of moral education, adhere to the student-centered principle, and strive to create public sports courses with distinctive characteristics. After physical training, students can enjoy fun, strengthen their physique, improve their personality and temper their will, so as to realize the organic unity of sports knowledge and skills training and moral education.

3. CONCLUSION

Moral education infiltration in the teaching of Public Physical Education in Colleges and universities is an important part of carrying out moral education throughout the whole process of Public Physical Education in Colleges and universities, comprehensively promoting the connotative development of public physical education courses in Colleges and universities and playing an important role in educating people. Colleges and universities and most front-line physical education teachers should fully realize the key significance of moral education infiltration in physical education teaching, strive to improve their moral education consciousness and teaching ability, constantly optimize the education system, excavate moral education elements, and carry out moral education to students with a definite goal.

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The Inheritance and Development of Traditional Sports Culture in The Perspective of Cultural Confidence

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Abstract: Chinese culture is broad and profound. As a multi-ethnic country, traditional sports culture is an important part of the diversified traditional culture of the nation, and it is the product of various nationalities in social production and life practice since ancient times. It contains the aesthetic concept and spiritual connotation of the traditional culture of the nation. It is also a kind of development and construction of the Chinese national spiritual family. It is of great significance to inherit the spirit of self-improvement and promote the development of the nation. Based on this background, this paper discusses the inheritance and development of traditional sports culture in the perspective of cultural confidence, hoping to promote the development and construction of a socialist cultural power.

Keywords: Cultural confidence; National tradition; Sports culture; Inheritance and development

1. PROBLEMS IN THE INHERITANCE AND DEVELOPMENT OF NATIONAL TRADITIONAL SPORTS CULTURE FROM THE PERSPECTIVE OF CULTURAL CONFIDENCE

1.1 The living environment of national traditional sports culture is deteriorating

With the continuous development of China's society, with the rapid development of urbanization and industrial development process, the current society has basically realized the transformation from agricultural civilization to industrial civilization. However, in fact, the national traditional sports culture is the product condensed by the working people of various nationalities under the background of agricultural culture, which leads to the loss of the living environment of national traditional sports culture. The unique form and function of agricultural culture society has been difficult to meet the social needs of the development of the times, making its existence constantly weakened. In addition, the continuous deterioration of the living environment makes the national traditional sports culture continue to be alienated, and the situation is gradually disappearing, such as the Yi Bell Dance and Qiang sheep skin drum dance [1].

1.2 The theoretical research system of national traditional sports culture is not mature

There was an upsurge of theoretical research on sports culture in China earlier, but the national traditional sports culture did not receive due attention, which made the culture did not have a mature theoretical research system as the support for the development and inheritance. On

this basis, due to the relevant personnel can not correctly perceive the essence and connotation of national traditional sports culture, theoretical research and practice gradually appear the phenomenon of disjointed practice leads to the lack of foresight and comprehensiveness of the research content, which has brought some obstacles and constraints to the development and inheritance of national traditional sports culture.

1.3 Lack of professional talents, cultural heritage fault phenomenon

Professional communication and promotion talents are the basic conditions for the inheritance and development of national traditional sports culture. However, with the continuous development of economy and society, people's living standards are constantly improving, and their traditional lifestyle and entertainment habits are quietly changing, which makes the audience of traditional ethnic sports culture decrease sharply, and the scope of target groups is also shrinking. Under the background of the development of the times, people, especially the young people, have less understanding of the national traditional sports culture, and can not have emotional identification with it. The artists of the older generation are gradually leaving the arena. Under the influence of external factors such as economic benefits, traditional sports culture leads to no successor, and the inheritance appears fault. For example, Anhui Fengyang Huagu opera has been facing the loss.

1.4 The government does not pay enough attention to the inheritance and development of national traditional sports culture

For the development of our country at this stage, the government's attention is still focused on the economic construction, which leads to the neglect of the inheritance, development and protection of the national traditional sports culture, and loses its important guiding role. At the same time, the local governments do not pay enough attention to the inheritance and development of national traditional sports culture, so it does not focus on this work. The establishment of corresponding management departments or the introduction of relevant supporting policies lead to the failure of sound and perfect laws and regulations or administrative protection of national traditional sports culture, which makes the development, inheritance and protection of national sports culture face greater risks [2].

2. EFFECTIVE STRATEGIES TO PROMOTE THE ACADEMIC PUBLISHING HOUSE

INHERITANCE AND DEVELOPMENT OF NATIONAL TRADITIONAL SPORTS CULTURE FROM THE PERSPECTIVE OF CULTURAL CONFIDENCE

2.1 Innovation based on tradition

National traditional sports culture carries rich national emotion and wisdom, and integrates national character and national spirit. For this nation, it has profound historical significance and connotation. Therefore, to promote the inheritance and development of national traditional sports culture from the perspective of cultural self-confidence must be based on national tradition, so as to avoid national transmission caused by splitting history and discarding tradition. In addition, culture has the advantages of the times. With the development of the times, the development and inheritance of traditional sports culture is not unchangeable. It also needs to rely on innovation to provide development vitality for itself. Therefore, relevant personnel must adhere to the open and integrated attitude to correctly treat the development of national traditional sports culture. We should inherit and combine with the characteristics of the times, carry out appropriate targeted innovation on it, and constantly enhance its vitality and core competitiveness, so that it can continue to grow in the long river of culture.

2.2 Strengthen the research of theoretical system

Theory is the cornerstone of culture. In the process of development and inheritance of national traditional sports culture, relevant personnel need to pay attention to the lack of theoretical research system support, and give them corresponding attention, do a good job in controlling it, so as to promote the systematic, perfect and mature development of the theoretical system, so as to continuously dig into the development principles of national traditional sports culture. Under its guidance, with the help of modern methods, we can achieve the reasonable integration of national traditional sports culture and modern sports culture, and achieve the purpose of promoting its development and inheritance. In addition, we need to improve the corresponding laws and regulations and establish the protection mechanism of traditional sports culture to protect its development and inheritance.

2.3 Vigorously develop national traditional sports

National traditional sports is a manifestation of sports culture, and vigorously developing national traditional sports can promote the development and inheritance of traditional sports culture to a certain extent. Based on this, local government departments can timely organize and carry out sports activities with national sports culture

characteristics, such as Taijiquan, fitness Qigong, rope skipping and national fitness dance. We should strengthen the publicity and popularization of sports in the region, so that people can fully realize the actual function and cultural value of sports, and constantly stimulate their enthusiasm for participation. We should pay attention to the improvement and innovation of diversified national traditional sports, abandon the items with infatuation and harm to human body, and focus on the innovation of sports activities that people like to see, continuously broaden the target group and audience base [3].

2.4 Pay attention to the significance of school in the development and inheritance of national traditional sports culture

The school is an important carrier for the inheritance and development of national traditional sports culture. The relevant departments should attach importance to the important role of the school, so as to integrate the national traditional sports culture into the school education system, and promote the traditional ethnic sports culture through interesting and diversified teaching methods. Knowledge lectures and other activities related to special topics will gradually develop young people into the backbone of the inheritance and promotion of traditional national sports culture, constantly open up cultural transmission channels and improve the quality of communication.

3. CONCLUSION

To sum up, from the perspective of cultural self-confidence, promoting the development and inheritance of national traditional sports culture is of great significance for the establishment of a pluralistic and integrated world sports culture system. Relevant personnel should attach importance to this work and take effective measures to shoulder the responsibility, so that national traditional sports culture can always stand in the forest of world sports culture.

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Influence Factors on Hydrodynamic Performance of Ducted Propeller

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Abstract: In order to optimize the design parameters and improve the hydrodynamic performance of ducted propeller, it is necessary to clarify the main influencing factors. In this paper, a 42 m trawler is taken as the research object, and the ducted propeller is designed. FLUENT software is used to calculate the hydrodynamic performance of the ducted propeller. The influence of the three factors, such as the length of the expanded duct, the angle of attack and the inclination angle of the propeller, is calculated without changing the shape of the propeller. It is found that the duct length is negatively correlated with the thrust and torque coefficients of the propeller, and positively correlated with the open water efficiency; the angle of attack is negatively correlated with the thrust and torque coefficients of the propeller in a certain range of forward speed; the open water performance will not be greatly affected when the propeller angle is lower than 10° . It is concluded that the duct length can be appropriately increased and the duct power angle can be reduced to effectively improve the hydrodynamic open water performance of ducted propeller. The research results can support the parameter design optimization of ducted propeller.

Key words: Ducted propeller; Fluent; Influence

1. INTRODUCTION

Ducted propeller is widely used in engineering field, also known as sleeve propeller, and has always been a hot research object in domestic and foreign academic circles. The process geometry structure of ducted propeller is complex, including duct fixed component, propeller rotating component, wing profile and line break angle. Because the use of ducted propeller can effectively improve the operation efficiency of heavy-duty propeller, it is widely used in heavy-duty ships. With the continuous innovation of technology in recent years, ducted propeller has also obtained rapid development, with complex propeller geometry, vortex, fluid separation and other conditions, resulting in complex flow structure. Therefore, in the research of propeller hydrodynamic performance, propeller experiment is also an essential and important means [2]. Moreover, in the current information technology era, the level of computer software and hardware system is constantly upgrading, providing technical conditions for the realization of high-precision numerical simulation [3]. Therefore, this paper uses FLUENT software to study and analyze the influence factors of ducted propeller hydrodynamic performance.

2. CALCULATION MODEL

In this paper, the RNG model proposed by yakhot and orzag is used to calculate the constant length turbulence.

After large-scale motion and correction, the small-scale motion is removed from the control equation according to the small-scale influence reflected by the viscosity term. Therefore, K equation and equation are very close to equation [4]:

$$\rho \frac{dk}{dt} = \frac{\partial}{\partial x_i} \left[(\alpha_k \mu_{eff}) \frac{\partial k}{\partial x_i} \right] + G_k + G_b - \rho \varepsilon - Y_M \quad (1)$$

$$\rho \frac{d\varepsilon}{dt} = \frac{\partial}{\partial x_i} \left[(\alpha_k \mu_{eff}) \frac{\partial \varepsilon}{\partial x_i} \right] + G_{1\varepsilon} + \frac{\varepsilon}{k} (G_k + C_{3\varepsilon} G_b) -$$

$$C_{2\varepsilon} \rho \frac{\varepsilon^2}{k} - R \quad (2)$$

Where, the turbulent kinetic energy induced by mean velocity gradient is expressed by; the turbulent kinetic energy induced by buoyancy is expressed by; the influence of the total dissipation rate produced by the fluctuating expansion of compressible turbulence is expressed by; the effective Prandtl reciprocal of K turbulent kinetic energy and dissipation rate is expressed by and respectively.

The formula for calculating the turbulent viscosity coefficient is as follows [5]:

$$d \left(\frac{\rho^2 k}{\sqrt{\varepsilon \mu}} \right) = 1.72 \frac{\bar{v}}{\sqrt{\bar{v}^3 - I - C_v}} d\bar{v} \quad (3)$$

According to the above equation integration, we can obtain the specific effect of the effective Reynolds number on the turbulent transport, which is helpful for the simulation of low Reynolds number and near wall flow.

Based on the analysis of the above control equations, the calculation model of ducted propeller is established in this paper. The propeller diameter of 250mm, the clearance between duct and blade of 1.8mm, 4 blades, 0.5dmm duct length, 1.0d pitch ratio, 0 propeller pitch angle, 0.70 disk surface, 19A duct type and 450R · min⁻¹ speed [6]. The coordinate values of the longitudinal section of propeller radius of 0.1R are designed, and the global coordinates are transformed into local coordinates, and the three-dimensional coordinates are established successfully. In addition, because the propeller has a complex curved surface structure, in order to avoid the design of smooth transition model, fluent software is used to successfully establish the propeller 3D model (see Figure 1).

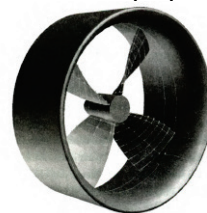


Fig. 1 3D modeling of ducted propeller

3. DESIGN THE HYDRODYNAMIC PERFORMANCE OF DUCTED PROPELLER

3.1 Mesh generation

According to the above three-dimensional modeling of ducted propeller, the calculation domain of the whole blade channel is used to complete the mesh calculation. The upstream and downstream blades of the propeller are taken as 2D and 6D respectively, and the 3D radial position is selected in the far field to establish the model grid (see Fig. 2).

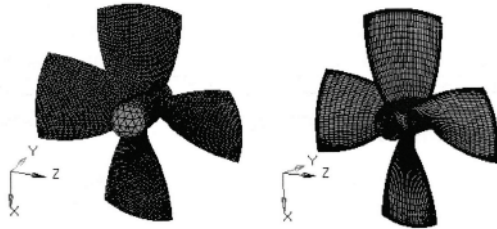


Fig. 2 Grid model of blade

As shown in the figure above, unstructured grids are divided into tetrahedrons, and the blades, hub, duct near wall area and rotating dynamic region are respectively densified to set the boundary height of the first layer grid, which is 10 layers in total. Verify the independence of grid model in this design, calculate and compare the two coefficient values of propeller thrust and torque with different grid numbers at 0.4 inlet speed. According to the calculation results, even if the grid number is more than 1 million, it will not greatly affect the calculation results, and the total number of grid partition is about 4.7 million.

3.2 Reliability verification

In order to verify the calculation reliability of the model grid in this design, thrust and torque will be generated in the process of d-diameter propeller rotating at angular speed. The hydrodynamic performance of propeller can be expressed in dimensionless way as follows [7]:

$$J = \frac{V_A}{nD} \quad (4)$$

$$K_{TP} = \frac{T_{prop}}{\rho n^2 D^4} \quad (5)$$

$$K_{TN} = \frac{T_{duct}}{\rho n^2 D^4} \quad (6)$$

$$K_Q = \frac{Q}{\rho n^2 D^5} \quad (7)$$

$$\eta = \frac{K_{TP} + K_{TN}}{K_Q} \cdot \frac{J}{2\pi} \quad (8)$$

In the formula, the forward velocity coefficient is expressed by J ; the thrust coefficient produced by propeller and duct is expressed by K_{TP} and K_{TN} respectively; the torque coefficient and thrust of propeller are expressed by K_Q and K_{TP} respectively; the open water efficiency is expressed by η ; the torque is expressed by Q ; the inlet speed is expressed by V_A ; and the thrust of the duct is expressed by T_{duct} .

Based on the experimental data of open water performance of ka4 ducted propeller, this paper uses the ducted slurry to achieve the experimental data which is consistent with the previous research results [8]. The control error between the two coefficients of thrust and torque is less than 5% under different inlet speeds, which proves the application reliability of the numerical calculation model in this paper.

4. ANALYSIS OF THE FACTORS AFFECTING THE HYDRODYNAMIC CHARACTERISTICS OF DUCTED PROPELLER

4.1 Catheter length

The duct is cut off from the middle chord length. After the inner and outer extension and contraction are completed for a certain distance, the cut-off part is connected with straight line under the premise that the shape of the front and rear edges is not changed, and the position of the propeller shaft center corresponding to the inner midpoint of the duct chord line is not changed. The design conditions are to lengthen and reduce the duct length by 10 mm, 20 mm and 30 mm respectively. The results showed that the following results were obtained

4.1.1 Under the condition of 0.2 ~ 0.6 inlet velocity, the total thrust coefficient increases slightly and the torque coefficient increases obviously with the decrease of the pipe length; at 0.7 advance speed, the total thrust coefficient is slightly reduced, but a certain torque coefficient is added, which reduces the water drainage efficiency under the condition of full inlet speed;

4.1.2 Under the condition of increasing the length of the catheter, the total thrust coefficient of the designed three kinds of pipe length is slightly increased compared with the basic pipe, and the torque coefficient is basically unchanged. Therefore, the water opening efficiency is slightly increased, and the length of 20 mm is the optimal effect of the three pipe lengths. According to the test conditions of duct length, the optimal duct length can increase the thrust coefficient of ducted propeller, which is obviously greater than the ratio of torque coefficient to achieve the best open water efficiency.

4.2 Catheter power angle

In this experiment, the opening performance of different duct power angles was designed under the condition of different duct power angles, and the shape of front and rear edges was not changed. According to the test results, it is found that:

4.2.1 Under the condition of 0.2 ~ 0.6 forward speed, the total thrust and torque coefficient of propeller are greatly increased with the decrease of power angle; under the condition of advance speed above 0.5, due to the negative thrust generated by the duct and the positive correlation with the advance speed, the change degree at - 10 ° power angle is more obvious than - 5 ° power angle, so the total thrust of propeller is greatly reduced To slow down the growth trend of the total torque coefficient. Under the experimental conditions of - 10 ° and - 5 ° power angles, it is obviously lower than that of the original propeller duct in the full speed range. However, it should be noted that in the condition of medium and low speed, such as 0.5 and - 5 ° power angles, 2.22% of the open water efficiency should be sacrificed to increase the total thrust and torque coefficients by 10.75% and 13.25% respectively. Therefore, the power angle of the propeller duct can be adjusted to the low and medium speed conditions When it is reduced, the thrust and torque coefficients of the duct slurry are significantly increased;

4.2.2 With the increase of power angle, the total thrust and torque coefficient of propeller are greatly reduced in the range of full advance speed. One of the differences from the test of reducing the power angle of duct is that the total thrust coefficient under the condition of 0.5 forward speed

is positive thrust duct. However, under the condition of full advance, the water opening efficiency is lower than that of the original duct, so the advance speed above 0.5 is obviously reduced Open water performance. It can be seen that ka4 duct increases the duct power angle, which is unfavorable to the open water performance of propeller. In this test, under the condition of 0.5 inlet speed and the design of -5° and 5° power angles, according to the axial velocity and pressure nephogram (see Fig. 3), it is found that under the working condition of -5° power angle, the axial velocity and pressure difference at different sections from the inlet to the outlet are larger than those at 5° which reflects the negative power angle of the pipe, which is called the straight pipe power angle, which can generate greater axial thrust Torque and torque. Moreover, under the condition of 5° work angle, obvious flow separation occurs at the rear end of the tail edge of the pipe, and the vortex does not occur under the condition of -5° working condition; when the inlet speed is continuously increased, the decreasing power angle makes the outlet relatively smaller, especially at high inlet speed, which hinders the outflow fluid, resulting in negative thrust of the duct and reducing the total thrust coefficient [9-10]. Therefore, only under the condition of medium and low speed, the acceleration effect of the catheter can be enhanced by reducing the power angle of the catheter. On the contrary, increasing the power angle of the catheter will reduce the outlet velocity, but gradually reducing the inlet velocity will also reduce the thrust and torque coefficients, so the deceleration effect will inevitably occur when the power angle of the catheter is increased.

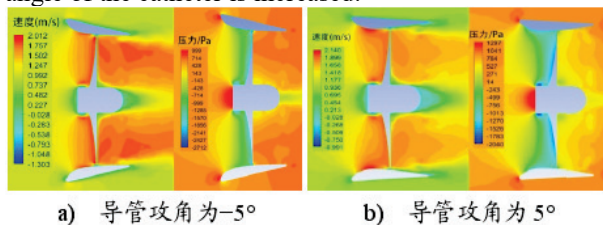


Fig. 3 Axial velocity and pressure nephogram

In order to influence the hydrodynamic performance of propeller by the length and power angle of the duct, different duct power angles of -10° , -5° , 5° and 10° were designed under the condition of increasing the length of 20 mm. The experimental results show that: under the condition of full inlet speed, the total thrust and torque coefficient of the pipe will not be affected with the continuous decrease of the power angle; at the condition of -5° the extended pipe with the speed higher than 5.5 will slightly improve the open water efficiency, but at -10° the opening efficiency will be slightly reduced; increasing the work angle of the pipe will not greatly affect the open water performance, only exceed 10° working condition When the inlet speed is over 0.5, the efficiency of opening water will be reduced to some extent.

4.3 Pitch angle of propeller

In this test, only different pitch angles of propeller are set without changing the relevant parameters of the original ducted propeller, and the open water performance under different test conditions of 5° , 10° , 15° and 20° are set

respectively. According to the test results, it is found that: (1) the open water performance of ducted propeller does not change significantly under the condition of 5° and 10° trim angle, and slightly increases the torque coefficient under the condition of 15° and 20° trim angle, which results in the decrease of open water performance to a certain extent. Therefore, in the actual design conditions, the pitch angle of the propeller can be appropriately increased, which will not affect the open water performance of the propeller, and can effectively avoid the interference caused by the blade close to the hull. It is found that the strength of propeller can be enhanced by increasing the pitch angle of propeller.

5.CONCLUSION

To sum up, through the analysis of the main factors affecting the hydrodynamic characteristics of ducted propeller in this study, the calculation model is established and the test is carried out by using FLUENT software. It is found that the duct length is negatively correlated with the thrust and torque coefficients of the propeller, and is positively related to the open water efficiency; in a certain range of advancing speed, the angle of attack is negatively correlated with the thrust and torque coefficients of the propeller; in a certain range of advancing speed, the angle of attack has a negative correlation with the thrust and torque coefficients of the propeller. The performance of the propeller will not be greatly affected by the inclination angle of 10° in the water. It is concluded that the duct length can be appropriately increased and the duct power angle can be reduced to effectively improve the hydrodynamic open water performance of ducted propeller. The research results can support the parameter design optimization of ducted propeller.

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On the Basic Sketch Teaching in Colleges and Universities

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Abstract: Under the new situation, traditional sketch needs artists to perceive the corresponding volume, shape and color changes in the traditional vivid performance. From the current situation, there are some differences and connections between the contemporary sketch and the traditional sketch, and the new visual language is derived, which embodies the two-dimensional processing of the plane and expresses the painting art of the contemporary language and spirit. As a form of painting, sketch not only embodies its own unique connotation, but also embodies different aesthetic values. In the process of sketch practice teaching, we need to follow the trend of the times and create the corresponding cultural atmosphere and aesthetic taste. Let the concept of innovation become more and more popular, and promote the sustainable development of education. Therefore, this paper puts forward the main path of scientific exploration.

Key words: University; Basic sketch; Teaching

1. QUESTION RAISING

From the current situation, the development of China's economy and culture also needs to increase the construction of basic courses on the basis of education reform, so as to lay a good foundation for the next step of development. Under the influence of the diversification of cultural forms, Chinese culture and art state are changing with each passing day. In addition to the "point, line, surface" three elements need to be reflected in the painting, but also need to constantly update the traditional artistic concept, on the basis of the original, emphasize the "spirit" design consciousness [1]. Sketch teaching not only needs innovation, but also needs to add some auxiliary teaching means, reflecting a strong sketch "modeling" skills. With the increasingly close connection of world cultural exchanges, many new materials and new technologies have been presented to our vision. Traditional art is constantly broken [2]. To speed up the reform of basic sketch teaching mode is to adapt to the development of the times. Only by renewing the concept of thinking can a new generation of creative and energetic art talents be created. In view of this, how to cultivate students' emotional attitude and values through the training of contemporary sketch? How to cultivate students' comprehensive ability? It has become the main content to be explored under the current situation.

2. THE INEVITABILITY OF THE CONSTRUCTION OF BASIC SKETCH TEACHING IN COLLEGES AND UNIVERSITIES

2.1 It plays a positive role in the construction of art major
From a practical point of view, art major is the focus of art school curriculum construction, which is not only a new

way of higher education construction, but also the main development form of art painting. Only by changing the traditional way of thinking, can we solve the problem of weak aesthetic consciousness, lay a solid foundation, and strengthen the development of dimensional teaching needs [3]. While paying attention to the basic sketch, we also need to maintain the basic skills. In the process of gradual progress, we need to sum up experience in practice, and become a qualified art creator, so as to lay a good foundation for the future development. Change the traditional teaching method, recognize the main position of students, according to the level of students' painting, strengthen the practice of activities, leave a broad thinking space for students' free play. Let students use the knowledge they have learned, and use it successfully in painting, so as to enhance students' comprehensive application ability of art in essence.

2.2 Positive contribution to the cultivation of students' creative thinking

From the current situation, most of the colleges and universities are beginning to extend to innovative education under the guidance of quality education. In the process of implementing sketch education and teaching, teachers need to broaden students' horizons and lay a good foundation for future learning [4]. In addition, in the process of implementing sketch learning, for students with low foundation, they need to have a solid foundation first, then analyze the composition consciousness, enhance their interest in learning, and mobilize their subjective initiative. Teachers can lead students out of the classroom, go deep into life, find inspiration in practice, and improve their appreciation ability in information technology.

3. THE CURRENT COLLEGE BASIC SKETCH TEACHING REFORM PATH

3.1 Comprehensively improve students' artistic accomplishment

In essence, art itself comes from life, but art is higher than life. Some excellent works of art are refined and condensed on the basis of reality. Only on the basis of materialization can the aesthetic be effectively re examined. In other words, it needs to extend from the "bamboo in the eyes" at the beginning to the "bamboo in the heart" and "bamboo in the hands" later [5]. Sketch is the basis of artistic modeling, which can play an important role in connecting the preceding and the following artistic creation of students. Whether it is the training of modeling ability or the need to strengthen the aesthetic cultivation of art, we need to improve the cognition and stimulate the corresponding emotions in the vision of art works. Students need to appreciate the sketch from the aesthetic point of view, and better perceive that the sketch training

is not plagiarism, but to sublimate the real image in the pure natural expression.

For teachers, they also need to pay attention and exchange on the basis of art. In addition, also need to have a unique taste and artistic point of view, show different thinking mode, have a greater impact on students' learning. After that, we need to perceive the important value of art enlightenment in the process of continuous learning. On the basis of teaching students in accordance with their aptitude, we should inspire students to think more and encourage them to express their ideas so as to find their own shining point in innovation.

From the perspective of practice, teachers not only need to teach the skills of sketch, but also need to introduce the corresponding artists to students from the perspective of art history, use multimedia to appreciate the works of masters, and perceive the connotation and value. For example, during the northern European Renaissance, sketch art was more inclined to the use of lines, most of which were constructed and combined on the basis of the combination of lines and surfaces. At this time, the sketch works not only have precise techniques, but also embody strong rationality and wisdom. Although there are not many strokes, they all embody infinite temperament and soul. Sketch has its unique artistic language and style. Only after careful exploration can we improve our cognition and meet the development path of modernization.

3.2 The teaching and learning of perspective anatomy is the basis of sketch learning

From the current situation, in the process of implementing sketch teaching, many colleges and universities need to carry out professional theoretical research on the basis of perspective. However, in the process of practice, only by mastering the basic law of perspective change, can we effectively perceive the change of object space, and combine with the reality to present the three-dimensional object image to the drawing paper more effectively [6]. If we know nothing about perspective knowledge in the process of drawing, it will lead to some difficulties in the future. Whether it is characterization, or landscape composition, there will be certain problems, creativity and vitality to stimulate more unable to effectively consider. If sketch teaching simply uses the traditional teaching method of "cramming", it can not stimulate students' interest in learning, and even bring boring feeling. At this time, teachers can use the means of information technology, multimedia way, the single perspective class, more intuitive to reflect the vision of everyone. In addition, we need to strengthen the relationship between sketch course and other courses, reflect the important value of the course, let everyone understand the artistry and innovation between perspective knowledge, and enhance the corresponding practicality.

From the point of view of the human body, there are not only great changes in the proportion, volume and psychology of the human body, but also great changes in a certain extent. For example, Da Vinci risked the life of the industry, personally dissected more than 30 corpses, and explored the psychology of them [7]. In other words,

only after the effective understanding of anatomy, can we more accurately perceive the vividness of the characters and improve the corresponding artistic appeal. In practice, analytical anatomy is a common phenomenon. Exploring anatomy can also effectively solve the problem of facial stiffness in sketch and the problem of unnatural body movements. For some students, it's easy to not know where the bones need to be placed in the painting, and even can't be used flexibly.

3.3 Explore the use of a variety of painting materials

For sketch painting, if students want to enhance the corresponding character expression in sketch, they need to use these basic materials reasonably. From a traditional perspective, pencil and sketch paper are one of the main materials. After carefully studying the master's works, we can see that they not only use pencil and sketch paper, but also use a lot of other materials. For example, in the Renaissance, many painters used their own sketch paper to match blue gray, yellow gray, earth red, brown and so on. In terms of the tools used, there are many different kinds of tools. At the same time, there are many ways to draw. You can use the rigorous way of arranging silver needles and water-based materials. No matter which way is used, it reflects the master's unique breakthrough, breaking the Convention and finding his own voice.

From the perspective of sketch teaching, it is not a matter of eager to achieve success. Only by reasonably integrating experience and constantly encouraging students to try, can we achieve satisfactory results over time. You can use water-based homemade paper to try, or you can use textured painting base to try. When expressing different painting methods, we should use diversified methods to enhance students' corresponding innovation ability and imagination ability.

3.4 The cultivation of abstract consciousness should be timely involved in the teaching of basic sketch

At the beginning, sketch teaching came from western countries. In these countries, abstract art can be divided into two different types: Hot abstract and cold abstract. In different types, the forms of artistic expression are also different. Abstract art corresponds to concrete art. No matter what type it is, it keeps effective consistency with nature and establishes good basic conditions to a great extent. For example, in the painting elements of point, line, surface, black, white and gray, it is necessary to meet the construction needs of constituent consciousness, emphasize the attention of artistic language, and maintain the micro contact state [8]. For example, copying calligraphy and assessing ancient architecture can find Abstract construction needs and show high artistic appreciation. For example, Mondrian will maintain a calm attitude when he arranges sketch painting, analyzing how he needs to draw and what kind of philosophy he needs to have. From the perspective of art, we should analyze the rigid cognitive errors, what kind of enthusiasm we need to use and what kind of active construction state we need to maintain after this period of learning. When learning basic sketch, students need to use abstract artistic thinking for construction, change the original appreciation vision, and promote the further extension of knowledge structure.

Whether the painting is good or not, we need to encourage students to read more books and take the initiative to explore on the basis of maintaining the reality. Expand their knowledge, enhance the overall effect, maintain good thinking, carry forward the spirit of craftsman. Sketch foundation also needs to extend the innovative spirit on the basis of modeling ability, maintain reasonable inspiration, establish a good foundation for the next step of happy experience, enhance students' thinking cognition, and lay a good foundation for the next step of development [9].

3.5 Appropriately affirm students' pursuit of painting style
For some artists, their artistic style can not be formed in a short time, and needs to be condensed in the long-term artistic practice. Many times, excellent works of art can present the content vividly to everyone's field of vision on the basis of the false to the true, reflecting the unique taste and strong construction requirements. For example: Leonardo da Vinci's Mona Lisa is on the basis of humanism, get rid of the shackles of religion, and open their own personal spiritual world. The woman in the painting is not only dignified and generous, but also plain faced, with a smile rising from the corners of her mouth, and the traces of years in her eyes [10]. In their paintings, artists embody the material texture, and combine the use of materials with the spiritual world to express different artistic beauty.

For different painting styles, there are different social backgrounds and philosophical ideas. The artistic world of sketch is not only the true expression of the author, but also the true expression of the artistic world. In the process of guiding students, teachers need to combine the characteristics of students, formulate scientific solutions, master the basic way of traditional sketch, and on the basis of tradition, develop towards the direction of diversification and personalization. In taking the essence to remove its chaff, we find the advantages of students and reach the main state of teaching students in accordance with their aptitude. Modern colleges and universities can also be combined with the needs of reality and extend to diversified teaching methods. On the basis of traditional sketch, in-depth analysis of painting language can help students master the basic law of painting modeling, lay a good foundation for future learning, and constantly find their own belongings in practice.

4. CONCLUSION

With the progress of society, basic sketch is not only the basis of painting, but also the starting point of art teaching. Today's society is diversified, open and inclusive in all aspects. In the process of implementing sketch teaching, we need to adhere to the main idea of "people-oriented", lay a solid foundation for painting, and explore a general education mode suitable for our students. We should guide

students to adapt to the society with a receptive attitude, and integrate new teaching ideas and teaching needs in the environment of art education reform. The diversification of art forms has become the most symbol of the times. Sketch teaching also needs to be based on diversification, constantly fierce in practice, find a suitable painting style, enhance imagination and creativity, and lay a good foundation for future lifelong learning.

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Problems and Countermeasures of Children's English Education in Private Schools

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Abstract: Children's English belongs to the enlightenment stage of English learning. With the continuous improvement of the importance of English language learning, public schools and kindergartens as well as private schools and kindergartens have opened English courses. Children's English education has become a focus of attention of the whole society, and it plays an increasingly important role in stimulating children's interest in English learning. But at this time, with the rapid development of children's English education in private schools in China in recent years, the problems in the development process have gradually emerged. Therefore, this paper aims to make an in-depth analysis of the existing problems in children's English education in private schools, and put forward targeted solutions, in order to better promote the development of children's English education in China.

Key words: Children's English education in private schools; Problems; Countermeasures

1. INTRODUCTION

At the same time, English education is a kind of education for children[1]. In recent years, children's English education in China's private schools has developed rapidly, which plays an important role in the cultivation of preschool children's interest in English learning and the improvement of English language ability. At present, many parents and even children's English educators have devoted a lot of effort in the process of children's English education, but sometimes the effect is not ideal, there are still many problems in children's English education. Therefore, it is necessary to analyze and solve the problems existing in children's English education in private schools, so as to improve the quality of children's English education in private schools.

2. THE COMMON PROBLEMS EXISTING IN CHILDREN'S ENGLISH EDUCATION IN PRIVATE SCHOOLS

With the improvement of daily living standards, many parents have realized that English learning plays an important role in children's future growth and development. For many children, English has gradually become a necessary course from the past interest in after-school[2]. At present, behind the vigorous development of children's English education in private schools, there are also some obvious problems, mainly including the following.

2.1 Strong utilitarian color

In fact, there is an educational basis for children to be

exposed to English education in their childhood. Scientific research has proved that 4-9 years old is the language sensitive period and critical period for children. At this stage, the influence and targeted English education on children often play an important role in students' future English learning and understanding of British and American culture. However, in this process, many parents realize the important role of English education for their children as soon as possible, but their starting point is obviously utilitarian. That is to say, the original intention of English education for their children is not to cultivate students' interest in English learning and let them feel the British and American culture, but to "add extra weight" for their children to attend famous schools and go abroad for further study. For this reason, many parents rush to apply for various English extracurricular classes and tutors for their children. What's more, they show their children English cartoons at the beginning of learning to speak, hoping to improve their English level earlier than other children. Under the guidance of this traditional idea of "exam oriented education", many parents blindly pursue their children's achievements in English learning. It is also one of the important reasons why many children gradually lose interest in English learning and even evade English learning when they are young, after studying in private schools for a period of time.

2.2 Rapid psychological prominence

In the process of children's English education, many parents often have a strong psychology of quick success. They often hear many parents criticize their children: "after learning English for so long, they still don't know a few words. If you ask him what he learned, he can't say it.". Many parents tend to have high expectations and quick psychology for their children to learn English, hoping that in a few months or a year or two they can let their children master the corresponding vocabulary and learn English communication in daily life, which is often very unrealistic. In fact, language learning often goes through a process of "listening" for about a year, that is, the "silent period" of language learning, that is, the stage of massive language input. When the children are in the silent period, teachers and parents of private schools should be patient enough to create more opportunities for children to contact English language materials, so that children can step by step.

2.3 Blind superstition of foreign teachers

Many parents often feel that foreign teachers are more effective than domestic teachers when they teach their children English, so when they choose teachers, they

prefer training institutions with foreign teachers. It is undeniable that foreign teachers are more pure, natural and standardized in pronunciation and intonation, and they are more persuasive than Chinese teachers. However, parents should also realize that speaking English and teaching English are two different concepts, and most foreign teachers do not know much about Chinese culture and Chinese children. Therefore, there are still many differences between Chinese and foreign teachers in terms of educational philosophy and education methods. Therefore, the actual effect of many foreign teachers on children's English education is often unsatisfactory, affecting children. The effect of children on English learning. Therefore, many private English training institutions employ foreign teachers to teach in order to expand the enrollment. The teaching ability of foreign teachers is also mixed, and the final teaching effect is not good. This is mainly due to the difficulties in communication and interaction between teachers and students in the classroom, which is basically "speaking from the same chicken to duck". The use of English language can not be fully explained and the effectiveness of teaching can not be guaranteed.

3. ANALYSIS ON THE COUNTERMEASURES OF CHILDREN'S ENGLISH EDUCATION IN PRIVATE SCHOOLS

Children's English education in private schools is not only an educational problem, but also a social problem, which needs the joint efforts of parents, training institutions and even all sectors of society [3]. Specifically, we should focus on the following aspects.

3.1 Parents should innovate their education concept and establish long-term thinking

Parents are important participants in the process of children's English education, and they are also the first teachers of children, playing an important role in the process of children's English Education [4]. As parents, we must first change the traditional concept of education, pay attention to guidance, encouragement and supervision in the process of children's English education, actively participate in the process of children's English education, accompany children to read, tell stories and participate in games; encourage children more, abandon the shortsighted quick psychology, and take English education as an important part. Long term, systematic learning process. According to the law of children's physical and mental development and cognitive language, we should choose appropriate school teachers to gradually guide children to accept and like English learning, so as to lay a solid foundation for future English learning.

3.2 Education authorities should further strengthen supervision and standardize the online children's English education and training market

Since 2013, with the vigorous development of online education, online children's English education has also stood on the wind. After 2015, online children's English has entered the fast track of vigorous development, especially in recent years, with the gradual younger age of studying abroad, children's English education is more favored by the majority of parents. This year, driven by

favorable policies and the new epidemic situation, online children's English has ushered in a new wave of development. At present, the market value of online children's English in China has reached 26 billion yuan, the user scale has reached 5.8 million people, and the market penetration rate has reached 22%. As the epidemic continues, it is expected that by 2021, the market penetration rate of online children's English education in China will reach 37% [5]. At present, China's online children's English education industry mainly includes North American foreign teachers' 1-to-1, small class, large class and light class, among which North American foreign teachers' 1-to-1 market share is the highest. At present, more than 42% of Chinese parents choose online English education for children, while the same proportion choose the combination of online and offline education. But at the same time, the current online children's English education is in full swing, and its problems are gradually exposed, especially in the lack of effective supervision of children's English training market, poor follow-up supervision effect, uneven training market, and lack of interaction in the education process. Therefore, in order to continuously improve the quality of children's English education, the education administrative department must continue to strengthen the effective supervision of children's English training, especially the online training market, and strictly set the access threshold. According to the development of children's English education and training in this region, relevant document systems such as opinions on the development of children's English education and training institutions should be issued, focusing on their school running qualifications. Teachers, etc., put forward specific and strict regulations to eliminate the "grassroots team" in the children's English training market, and regularly carry out random secret visits to realize the "full coverage" of key inspections. The administrative department of education should timely cooperate with the departments of market supervision, public security, education, fire control, civil affairs, human resources, neighborhood committees and other departments to carry out investigation. Once it is found that training institutions carry out training in violation of regulations, they should promptly investigate and deal with it and make it known to the public. At the same time, in order to standardize and renovate the children's English education and training industry, it is necessary to improve the children's English training laws and regulations, formulate the qualification standards for employees of training institutions, establish a long-term mechanism, and strive to standardize the healthy and orderly development of children's English training market.

3.3 Parents should master the correct way of English education

In the process of children's English education, parents are one of the important participants, and the scientificity of their methods directly affects the effect of children's English learning. In reality, many parents are unable to master the scientific education method, resulting in the problem of children's English learning effect. Research has proved that children can only get 10% of the

information through "reading", 20% of the information can be mastered through "listening", 50% of the information can be obtained through "looking", and 95% of the information can be obtained through "teaching others". It can be seen that the information obtained through communication with others is the most. Therefore, parents should first let their children "learn by doing" and "learn by playing", so as to maximize the mobilization of children's multiple sensory organs and make it easier for children to obtain English information. Parents can use the form of English drama to let their children acquire knowledge in the drama performance; actively create real situations, so that children can learn simple communication in English and understand the instrumental value and humanistic value of English; they should try to transform the scenes in books into real situations, such as moving the Games in picture books into reality, so that children can understand them in practical use English, perceptual English, use English.

4. CONCLUSION

In short, children's English education in private schools is of great significance in effectively cultivating children's interest in English learning and improving children's English thinking, which is a powerful supplement to English Teaching in public schools and kindergartens. With the continuous improvement of people's attention to children's English education and the continuous popularity of children's English education market, the

relevant government departments, public schools, private schools and parents should actively work together to establish a correct concept of children's English education, master scientific education methods and gradually standardize children's English education and training market. In this way, we can promote the steady development of children's English education and give full play to its educational role.

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Information Teaching Practice of NC Lathe Programming and Machining Course in Higher Vocational Education

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Abstract: Higher vocational education is an educational institution to cultivate students' comprehensive development. In the course of NC lathe programming and machining, influenced by traditional education, most professional teachers' teaching ideas and teaching methods are very single, which is extremely unfavorable for the learning and development of college students. Then, with the popularization of information technology, higher vocational CNC lathe programming and processing course also ushered in a new opportunity, professional teachers how to use and carry out practice is the task to be valued at present. This paper discusses the feedback of preview before class, the specific implementation strategy in class and the consolidation after class, and puts forward personal opinions on the informatization teaching practice of NC lathe programming and machining course in higher vocational colleges.

Key words: Higher Vocational Education; CNC lathe programming; Machining course; Information Teaching

1. INTRODUCTION

Higher vocational CNC lathe into and processing professional course contains a strong technical, if a single indoctrination teaching method to teach students knowledge, then the efficiency of teaching will be very poor, and students will gradually lose interest in learning, and even the mood of weariness of learning. As a highly practical major, it is very important for students to improve their practical ability in the process of hands-on operation, because if students only study theory and have no operation basis, they can not achieve the effect of applying what they have learned. Moreover, in the specific operation, because the steps are more complicated and many details are easy to make mistakes, only the students master the operation proficiency can they really achieve the goal I have a thorough understanding of this major.

2. FEEDBACK OF PREVIEW BEFORE CLASS

The content of the course of turning and machining CNC lathe needs to be practiced on CNC lathe to enable students to master it effectively. It is far from enough to rely on rich knowledge reserves. And if teachers let students memorize by rote, imagine that college students do not understand and have no contact with it. Even if they recite it, they will soon forget it. Therefore, when designing teaching practice, teachers should start from preview before class.

2.1 Design and make information resources for pre class preview

There are many knowledge points related to the course,

and there are many steps in the specific operation, which need to be assisted by certain resources in order to let college students really understand. When teachers design teaching tasks, the key point is resource assistance. We need to take college students' learning as the center, comprehensively consider the resources they need, and determine the display mode of resources through practice in the process of continuous innovation and improvement. For example, video, animation, simulation and testing, etc., these diversified display methods can bring different effects, so as to help students understand and master. In addition, in the production of curriculum resources, we can use PPT to show the key points, shoot micro video and edit animation, and turn the specific CNC lathe into steps to show, so that students can feel like they are in the scene. And in order to make students experience more rich, teachers should also consider from the perspective of video beautification, so that the effect of classroom is more obvious.

2.2 Establish a simple e-learning resource platform

The quality of curriculum resources will directly affect the learning effect of students, and on the basis of using information-based teaching, whether college students are willing to invest enough energy is the key point. If the construction of curriculum resources is very chaotic, then the search will be very cumbersome, which will only bring them disgust and difficulty. Therefore, in the course of NC lathe programming and processing, the teaching resource platform established by teachers needs to be simplified as the starting point, and various resources are arranged in a certain order and concise. In this way, college students will be able to consult more easily, so that they can learn according to the order set by the teacher [1].

2.3 The task is distributed by the teacher platform, and the students preview independently

On the basis of the integration of professional courses and information technology, we can break the limitation of time and below. As a professional course of NC lathe programming and processing, teachers can use the network to send preview tasks, while students use mobile terminals to receive them. Teachers then distribute the resources they need to use to the class groups, providing assistance for their preview tasks. In the background, teachers can build a communication platform. When students encounter difficulties in preview, they can discuss with other students or ask teachers for advice, which can also lay a good foundation for practical teaching.

3. SPECIFIC IMPLEMENTATION STRATEGIES IN ACADEMIC PUBLISHING HOUSE

THE CLASSROOM

In order to improve the teaching efficiency of turning CNC lathe into and machining course, teachers should combine theory and practice organically in classroom teaching, and then arrange the teaching plan, so that students can complete the learning tasks in order. This can be divided into five steps: the first is preview feedback. When students finish preview and start teaching the next day, they can transmit their preview results to teachers through the network, and then discuss according to the group. The second is to solve the puzzle of new knowledge. According to the new knowledge points to be taught, teachers let students interact with each other, and then show the problems they don't understand in the preview, and show them to the teachers in the form of drawings and tables [2]. The professional teachers teach the students what they don't know according to the prepared micro videos and resources, and use the methods of group discussion and multimedia display to solve the students' questions. The third is that teachers can use the network live broadcast function to demonstrate some standard operation procedures for students to observe in the practice class. In this way, they can raise their hands to ask questions by using the equipment, and the teachers can repeat the details according to their questions. When the students operate, the professional teachers will patrol back and forth between them. If the students have any questions, the teachers should answer them and re demonstrate them, so as to promote their practical ability. The fourth is classroom evaluation and summary. After students' learning tasks are completed, teachers should list and comment on the key and difficult points according to their actual learning situation, and then summarize all the knowledge of this class and let students reflect on it for consolidation. The fifth is that after the class, the teacher asked the students to reply the introduction and practice involved in this class in groups, and the teacher had problems, so as to maximize the quality of NC lathe programming and processing course in higher vocational colleges.

4. CONSOLIDATION AFTER CLASS

At the end of the class, higher vocational CNC lathe programming and processing professional teachers need to design some platform test questions on the network, let students use their own mobile terminal equipment to answer, integrate their knowledge into it, and then show the learning results, so as to play the best consolidation effect. In addition, teachers should also use QQ or wechat to set up groups. When students encounter some problems that they don't master in class after class test, they can raise them, and then communicate with classmates and teachers, so as to consolidate knowledge and exchange various kinds of information [3].

5. CONCLUSION

To sum up, the NC lathe programming and processing course in higher vocational colleges is a relatively complicated practical discipline. However, with the assistance of information teaching, most vocational colleges have realized the transformation of information-based teaching mode. With the assistance of equipment, this can help professional teachers design diversified teaching modes, and students can be lighter in this course. Loose and efficient grasp of knowledge, so as to lay a good foundation for its future development.

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The Current Situation of Personnel Management in Higher Vocational Colleges and The Exploration of Information Construction

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Abstract: In recent years, with the continuous reform and innovation of China's education, the teaching methods and management methods of many schools have undergone great changes, and the personnel management of higher vocational colleges is an important management content of the school, which can not only effectively solve the personnel management problems in higher vocational colleges, but also improve the efficiency of personnel management in higher vocational colleges. But the traditional personnel management methods and methods have been unable to meet the current needs of higher vocational colleges, so we must reform the current situation of personnel management in higher vocational colleges. In this paper, the author analyzes the current situation and existing problems of personnel management in higher vocational colleges, and expounds the significance of personnel management information construction in higher vocational colleges.

Keywords: Higher vocational colleges; Personnel management; Current situation; Information construction; exploration

1. INTRODUCTION

Personnel management is a more complex and cumbersome work, and in the rapid development of information technology today, the content of personnel management work is also greatly increased, so the traditional personnel management has been unable to meet the needs of the 21st century information age. Therefore, the relevant managers of higher vocational colleges need to reform and innovate the traditional personnel management mode, and join the construction of personnel information in the reform process, so that the whole personnel management has a new development direction.

2. THE CURRENT SITUATION AND PROBLEMS OF PERSONNEL MANAGEMENT IN HIGHER VOCATIONAL COLLEGES

2.1 Lack of attention to personnel management in Higher Vocational Colleges

At present, the leadership and management personnel of many higher vocational colleges do not attach great importance to personnel management. Many people only stay in the primary stage of daily affairs, and do not really understand the importance of personnel management and personnel management information construction, so this leads to the personnel management and information construction of the whole higher vocational colleges Progress has been slow, and there has been a negative attitude towards work.

2.2 Lack of complete personnel information management system

Personnel management in the daily management of higher vocational colleges, will play a connecting role, not only for the superior leadership to provide information support, but also for internal personnel information management. However, due to the continuous development of China's higher vocational colleges, its scale and number are also increasing, which leads to more and more teachers, which brings great challenges to personnel management. But the most important thing is the lack of a complete set of personnel information management system in higher vocational colleges, which leads to the confusion of personnel information management system in higher vocational colleges.

2.3 The accuracy of personnel information in higher vocational colleges is low and the update speed is slow

The traditional way of personnel information management is mainly managed by hand, only a small amount of data information software is used to process data, which leads to the slow and accurate personnel information management in higher vocational colleges. Therefore, in this case, it is unable to update and track the information of the staff in a timely manner, and it will seriously restrict the superior leaders of higher vocational colleges to make judgments.

2.4 The quality of personnel management personnel is low
The efficiency, speed and level of personnel information management are closely related to the comprehensive quality of personnel specialty, and the current personnel information management has higher requirements for staff. However, many personnel management personnel in higher vocational colleges are not specialized in personnel work. The relevant personnel managers of the school will be transferred from teachers of different positions and different majors to work in the personnel department, so the professionalism of personnel information management personnel is generally poor, and many do not know how to use information processing technology, which seriously affects the whole higher vocational colleges The development of personnel information management.

3. MEASURES TO STRENGTHEN THE CONSTRUCTION OF PERSONNEL MANAGEMENT INFORMATION IN HIGHER VOCATIONAL COLLEGES

3.1 Strengthen the importance of personnel information management in Higher Vocational Colleges

First of all, if we want to reform and innovate the personnel information management in higher vocational

colleges, we must pay more attention to the construction of personnel information management, and establish a modern concept of personnel information management. As the development direction of higher vocational colleges, it is self-evident that the leaders of Higher Vocational Colleges attach importance to personnel information management and the importance of cognition. Therefore, it is necessary to let leaders of Higher Vocational Colleges attach importance to personnel information management, establish a modern management concept, and mobilize the enthusiasm of personnel staff at all levels and departments, so that the efficiency of personnel information management and the quality of maintenance work can be obtained Overall improvement.

3.2 Establish a perfect personnel information management system

The work of personnel information management in higher vocational colleges is not only very heavy workload and information, but also has certain randomness. Therefore, in order to improve the personnel information management system, it is necessary to establish a good basic database, which mainly includes the information data of teaching staff and the information content of personnel files. Secondly, it is necessary to refine the personnel information management system, such as personnel department management, teacher department management, logistics personnel management, etc. such a standardized management mode can be more convenient for personnel staff to manage [2]. Finally, we should strengthen the construction of campus network, and establish the information management system through network technology, such as attendance, salary, class hour, bonus and so on. The improvement and construction of this information system also promotes the construction of personnel information management system.

3.3 Standardize the operation process of personnel information management

In the personnel information management system, the efficient work mode cannot do without the standardized management process, so the personnel information management system must be combined with the standard operation process. Because personnel information management is not only related to the interests of staff, but also has a serious impact on the overall work of higher vocational colleges. Therefore, it is necessary for the relevant person in charge of personnel management to strengthen the continuous standardization and optimization of personnel information management process, and adhere to the principles of fairness, justice and openness, while improving the personnel information management work, actively accept the supervision of all units, departments and institutions.

3.4 Improve the professional quality of personnel management personnel

In the personnel information management system, the

comprehensive quality of personnel management personnel has an important impact on the personnel information management work. At present, many personnel management work is still dominated by people, and the information system is only an auxiliary management tool. Therefore, in the current personnel information management system, professional, high-level, high-quality management personnel for the development and construction of personnel management work has an important help, and these professional personnel management personnel is one of the key factors of success [3]. Therefore, the relevant person in charge of higher vocational colleges should strengthen the professional quality, information level and professional ethics of personnel management personnel and staff, such as regularly carrying out training activities, skill seminars, skills competition, information technology exchange meeting and other contents to improve the comprehensive quality of personnel information management personnel. In addition, higher vocational colleges can also employ high salary to find out Looking for some professional and technical personnel management personnel to cultivate a professional, high-quality, high-level personnel management team for their own school.

4. CONCLUSION

To sum up, due to the increasing number of Higher Vocational Colleges and the growing number of teachers, the role of personnel management in higher vocational colleges is particularly important. However, there are still many problems in the personnel management of many higher vocational colleges in China, so in order to effectively solve these problems, the relevant management personnel of higher vocational colleges need to establish new management concepts, so as to promote the improvement of personnel management information construction in higher vocational colleges. In this paper, the author analyzes the problems existing in the personnel management of higher vocational colleges, such as the degree of attention, management system and personnel quality, and expounds the corresponding solutions and methods, hoping to bring help to the personnel management personnel in higher vocational colleges.

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The Role of Campus Cultural Resources in The Ideological and Political Education of College Students

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Abstract: Campus culture resource is a kind of value resource and an important embodiment of school soft power. With the continuous deepening of the ideological and political education reform in Colleges and universities in the new era, strengthening and playing the role of campus cultural resources construction in the ideological and political education of college students has become an important backing force for colleges and universities to strengthen and improve the ideological and political education of College Students under the new situation. Colleges and universities should attach great importance to the construction of campus culture, so that the campus culture can be integrated into the daily life of college students, into the inner world of college students, and become the spiritual home for the healthy growth of college students.

Keywords: Campus cultural resources; Ideological and political education of college students; Role

1. INTRODUCTION

It is necessary to attach importance to and strengthen the construction of campus cultural resources in order to continuously implement the fundamental mission of establishing morality and cultivating people in Colleges and universities, and to enhance the pertinence and attraction of Ideological and political education in Colleges and Universities under the new situation[1]. Colleges and universities should actively start from the historical evolution and long-term development process of the school, fully tap and revitalize the campus cultural resources, implement the construction of campus culture, give full play to the educational role of campus culture, and strive to promote the healthy growth of college students in a diversified way.

2. CONNOTATION ANALYSIS OF CAMPUS CULTURAL RESOURCES

Campus cultural resources belong to a recessive resource in Colleges and universities. They are the soul, connotation and banner of colleges and universities. They are important contents and carriers for universities to implement the fundamental task of establishing morality and cultivating people. They are also a long-term, long-term and long-term project [2]. Campus culture provides the soil and support for college students to receive good education and realize individual growth. It not only serves and affects the majority of teachers and students, but also extends its influence and radiation power beyond the campus. It is an important part of contemporary culture. College students can be divided into two types of material

resources, such as campus cultural resources, campus cultural resources and so on. More intuitive to feel the good atmosphere of campus cultural construction, but also can more quickly set off the richness of campus cultural resources, it is the basic part of the construction of cultural resources in Colleges and universities; spiritual form culture construction mainly includes the formation of class slogans, class atmosphere, school atmosphere, various civilization system construction, etc., compared with the material culture form, spiritual culture is easier. It can influence and guide students imperceptibly.

3. THE ROLE OF CAMPUS CULTURAL RESOURCES IN THE IDEOLOGICAL AND POLITICAL EDUCATION OF COLLEGE STUDENTS

At present, the positive role of campus culture construction in college students' Ideological and political education has been widely recognized. Specifically, its role is mainly reflected in the following aspects:

3.1 Carrier function

Campus cultural resources are an important embodiment of the soft power of colleges and universities, and also an important supporting force for ideological and political educators such as counselors to carry out the ideological and political education of college students [3]. In the process of carrying out the ideological and political education of college students, counselors need to constantly innovate the carrier of Ideological and political education work. Campus cultural resources just provide an effective way and support force. College counselors should make full use of the unique campus culture and carry out ideological and political education for college students. For example, for colleges and universities in the old revolutionary base areas such as Hunan, they should make full use of the red campus cultural resources formed in the long-term process of running a school, turn the red Campus cultural resources into the advantages of Ideological and political education, and constantly innovate ideological and political education. In order to improve the pertinence and effectiveness of Ideological and political education in Colleges and Universities under the new situation, the first is to highlight the "fresh" characteristics in the teaching content, focus on the use of red campus cultural resources, introduce red stories and red cases from alumni in the teaching process, and carry out the education and inheritance of "national feelings", "patriotic education" and "daring to be the first". Second, we should highlight the characteristics of "innovation" in teaching methods and methods, make full

use of situational, interactive, experiential and other new teaching methods, and bring the red campus culture into the ideological and political education classroom. At the same time, we should continue to strengthen the practical teaching, extend the ideological and political classroom to visit the school history museum and the cultural relics on campus, and through this vivid and vivid practical experience Methods: let students really edify in the thick red campus culture, feel the thick campus red culture, and strive to enhance the students' love of laughing, patriotic and serving the motherland. The third is to highlight the characteristics of the times in teaching means. Teachers should actively use multimedia technology to apply new media technology in the process of Ideological and political education from multiple angles and dimensions, innovate teaching methods and means, use flipped classroom, blended learning and other new teaching modes, actively realize the integration of campus red culture and ideological and political education in Colleges and universities, and continuously improve the ideological and political education in Colleges and Universities under the new situation The pertinence of governance and education.

3.2 Regulatory role

Campus culture plays an important role in the ideological and political education of college students, which is mainly reflected in the guidance and regulation of students' world outlook, outlook on life and values. With the development of the times and the arrival of the new media era, contemporary college students have more and more access to information. At the same time, it also brings many uncertain factors to the ideological changes of college students. A small number of college students have the phenomenon of multiple coexistence in world outlook, outlook on life and values, and some college students even have deviations in world outlook, outlook on life and values, All kinds of social thoughts and the spread of network bad information have a great impact on some college students. Some college students have bad ideological tendencies such as individualism, money worship and hedonism, utilitarian tendency in personal pursuit and life planning, and the value orientation of collectivism and patriotism has been dispelled. All these are ideological and political education in Colleges and universities in the new period The practical problems that workers need to face and solve in the process of practical

education. Campus cultural resources have been gradually formed in the long-term practice of colleges and universities, and have a distinct positive guiding role and value incentive role. Teachers can make full use of these excellent campus cultural resources to carry out positive guidance on students, guide them to strive to overcome the influence of various adverse trends of thought, establish correct and positive life value orientation, and at the same time, they can also make full use of them With the recessive educational function of campus cultural resources, through holding various activities and strengthening the construction of classes and groups, we can imperceptibly guide and regulate the value of students, and gradually guide them to form a correct world outlook, outlook on life and values.

4. CONCLUSION

In short, campus cultural resources play an important role in the ideological and political education of college students, such as carrier, regulation and incentive. The vast number of college counselors and University front-line ideological and political education theory course teachers should fully realize the important significance of campus cultural resources in the ideological and political education of college students, constantly excavate, innovate and revitalize the campus cultural resources through ways and means, realize the organic connection and integration of campus cultural resources and ideological and political education of college students, and effectively improve the ideological and political education Effectiveness.

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Post MOOC Era: Sustainable Development of Online Education in Colleges and Universities

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Abstract: With the progress of the times, the education industry is also in continuous development. Colleges and universities are also thinking about and reforming the original education concept, principle and teaching method, changing the traditional teaching operation mode of colleges and universities. With the large-scale open online course (MOOC) sweeping the world in a very short time, it also brings new challenges and opportunities for the teaching methods of colleges and universities. While formulating new teaching methods, colleges and universities must have a deep understanding and understanding of large-scale open online courses (MOOC), and give full play to the advantages of digital technology in the new teaching methods and business models to cope with the education reform and in-depth exploration in the new era. This paper will be in the first: large scale open online courses (MOOC) has spawned three new features: openness, profit model, service separation. Second, colleges and universities should explore the progress of MOOC and other online teaching from the perspective of learners' needs, the innovation of teaching and learning methods and the choice of technology. Third, colleges and universities should boldly face the challenges and opportunities in the new era of education reform, and timely adjust the strategy, innovate in the business model, so as to ensure the sustainable development of education. On the basis of the three points, this paper analyzes in depth how colleges and universities face the development and progress of online teaching such as MOOC mode in the future.

Key words: Teaching reform; Business model; Large scale open online course (MOOC)

1. INTRODUCTION

With the gradual deepening of the impact of economic globalization, the development of higher education on the road of internationalization has also encountered bottlenecks, and the competition for students at home and abroad is becoming increasingly fierce. Many governments think that higher education should not be limited to the current mode of financial allocation. The best way to change the existing mode is to marketize higher education, which promotes the healthy competition and development of colleges and universities in education and business model. At the same time, under the premise of the development of science and technology, some colleges and universities have explored a set of new teaching mode and business model, which provides new opportunities for the reform of education.

Nowadays, students think that the importance of learning to social development and improve themselves is

irreplaceable, so they have a strong desire for learning. However, even if universities and the government provide scholarships and other help to alleviate the economic pressure of students, it can not fundamentally solve the expensive existing college education mode. Large scale open online courses (MOOC) attract a large number of students with flexible learning methods and low capital cost. For this important reason, many colleges and universities have also shifted their attention to large-scale open online courses (MOOC).

At present, the development of MOOC is only in its infancy, and the threat to the traditional education mode and business model is very limited. Many companies providing MOOC will gradually change the main body of education from students to enterprise vocational training. If MOOC wants to be more attractive and successfully attract a large number of learners, providing credit courses and degree courses is also an indispensable learning support service, so that students can fully understand their own learning situation while receiving education.

At present, many experts are exploring a feasible way for the future development of MOOC. Some people think that the future development of MOOC should develop a set of low-cost business operation mode and effective degree granting mode while ensuring the learning quality of learners. Even though the development of MOOC is not perfect, the MOOC mode is also a kind of impact on the existing traditional education mode, and has a great impact on the new enrollment mode and education mode.

2. KEY CONCEPTS OF MOOC DEVELOPMENT

Large scale open online course (MOOC) as the name implies, openness and large number of people are the design concept of MOOC. As early as 2008, Downes and Simmons created the world's first MOOC software CCK08 with free online services. This course has a clear start and end date and is open to anyone free of charge. This MOOC is currently known as the relevance MOOC (cmooc).

The real formation of business model is the emergence of three major MOOC platforms in 2012, known as xmooc (behaviorist MOOC). They form educational cooperation with colleges and universities and release some courses of top universities to all. Some of these courses have profit-making purposes and these companies are invested by commercial companies. Therefore, even if there is some reference for the relevance based MOOC (cmooc), it is still very useful Big difference.

The two MOOCs are slightly different in four aspects: large scale, open, online and course. First of all, on a large scale, cmooc emphasizes community and association, and the community can directly contact with learners to

facilitate learning. However, although xmooc can provide a large number of registrations, it is fundamentally emphasizing the profits that can be obtained by a large number of people. The opening of cmooc not only means that it can learn for free, but also has relatively open requirements for copyright. On the contrary, although xmooc also has free access, it has strict restrictions on copyright. Online, the former wants learners to use the services of various platforms in the community network to learn, while the latter lets learners learn alone in a specific platform.

With the gradual improvement of MOOC, the impact on traditional education is also growing. The impact on openness, profit model and teaching function also promotes the development of colleges and universities. With the further development of MOOC, xmooc and cmooc may be integrated together. In the future progress of MOOC, it is necessary to balance the teaching content and social learning.

2.1 Openness: expansibility and relevance

In the traditional field of education, openness refers to a wide range of words, such as the conditions of registration and the cost of courses after admission, the degree of openness and utilization of public resources to students. However, the conditions for enrollment in cmooc are relaxed a lot, and because the existence of the Internet is convenient for learners to learn directly from basic public resources, this move makes cmooc go beyond the limitations of traditional higher education and expand many courses. Through the relevance network cmooc, students with the same learning interests are gathered together to form a learning cooperation group, and learners expand the content of cooperation to a wider range of fields after the end of the course. The dialogue and exchange of learners on the Internet not only transcends the region and time, but also enables learners to learn and negotiate continuously all over the world. This design of cmooc creates a new teaching concept and brings a large number of students.

In the concept of xmooc, openness is also very important. Through organizing the content in advance, learners can learn and bring a large number of learners. In this way, the collected data can be used to sell some additional products to earn income. In this way, a new business profit model is developed. In order to retain more learners and reduce the cost of capital in teaching, we should set up a new business profit model. They used a large number of videos and gave automatic feedback to students' learning tests.

These two MOOC models have their own emphases, but they both warn the development of the traditional education model. We should innovate boldly in the connectionist network, and carry out the teaching reform experiment centered on the education in the Internet social networking. In the behaviorism MOOC, it is more profitable. However, due to the fine content, a large number of learners are attracted to conduct data analysis. Therefore, the two kinds of MOOC are strong and weak points, and the combination of essence and its dross is the most effective way to [1].

2.2 Profit model: free and charged services

The advanced nature of MOOC's business strategy is obvious to people. It is widely used by technology and Internet Co around the world, providing free services and products to users, but charging extra high level. This business model is highly praised by technology companies such as Tencent and Sina in China and Twitter and Facebook abroad. The success lies in attracting a large number of free users and providing charging advanced projects when the user experience is good [2].

2.3 Service separation: spin off and restructuring

Service separation refers to that many companies leave some relatively unimportant business to better companies after retaining the core part for users, which is also the practice of many companies for product services. The advantage of this is that users have an excellent experience when using the products, but the disadvantages are also extremely obvious. Compared with the centralized service companies, after the separation of services, the products are no longer flexible and slightly clumsy when upgrading, and the feedback from external users is not timely and relatively slow, which is very easy to be eliminated by the market.

In the above-mentioned theories, colleges and universities retain the most important teaching content - teaching link, and separate some relatively unimportant businesses, such as enrollment, marketing and internet teaching platform business, to MOOC company. In the learning achievement test of learners, colleges and universities are responsible for the examination, and the third party is responsible for the implementation and monitoring of the learner examination. In traditional education, centralized management system is adopted in the field of higher education to carry out unified management of all businesses and one-stop service from enrollment to graduation evaluation and certificate issuance [3].

3. THE INFLUENCE OF MOOC ON COLLEGE TEACHING AND LEARNING

3.1 Technology selection

With the progress of the times, the development of MOOC has sounded the alarm bell for colleges and universities, which has aroused a strong interest in online distance learning in Colleges and universities. A problem that colleges and universities have to face now is how to choose the technology application of online learning platform including MOOC to meet the special needs of colleges and universities. The MOOC provides a great reference for colleges and universities in the formulation of strategic terms[4].

3.2 Teaching method innovation

The change of MOOC on teaching has aroused extensive thinking from all walks of life in the society. However, the current MOOC is basically similar to the existing online distance teaching practice. In the early MOOC carried out in-depth research on the relationship between learning and society, at the same time, the traditional teaching method is still in use, which is still of guiding significance to the present.

The current online teaching reform should be decided by colleges and universities according to their own conditions. For example, the online teaching reform can

be implemented from a teacher to an individual, and gradually extended to the whole school from a teaching pilot. It can also be applied in large aspects such as college departments or the whole school level, which is also a profound teaching reform.

The biggest difference between MOOC and traditional higher education in teaching design is that the traditional teaching design takes the teacher as the center to design the learning content and decide the teaching method. However, MOOC greatly enhances the learner's learning autonomy and control power, and can decide what content they want to learn and choose the service and work to be used in the learning content. Yes. We can start with the details of what we want to learn, and carefully arrange our own learning plan. We can also roughly pass the learning content according to our own situation. Learners have great autonomy rights, which is often not achieved in the teaching design of learners in traditional colleges and universities.

In terms of assessment, MOOC is quite different from traditional education. MOOC's assessment and evaluation of students mostly includes electronic portfolio, peer evaluation and achievements in practice. If MOOC adopts the assessment method of traditional colleges and universities, it is necessary to face and reasonably solve this problem. If MOOC adopts the credit system, it will be difficult for colleges and universities to consider the quality and reputation related similar assessment.

The role of teachers in learning also needs to change. From traditional lecturers to learning partners of learners in MOOC, they can help learners improve their ability in the face of community communication and cooperation. Their vision is not limited to passing the school curriculum assessment, which also means that the role of students in learning has also changed.

3.3 Learners' needs

What learners need to think about is how much help can be provided to learners after graduation, whether the cost is in their own budget in the process of learning, and whether the formal certificates issued by colleges and universities meet their own needs, that is, whether they meet or not and informal self-evaluation.

At present, the development of MOOC is facing a choice. Many people think that if MOOC wants to play its potential in higher education, it must integrate the self-evaluation system into the evaluation system of higher learning institutions. For example, after the completion of their own learning, learners pay the corresponding fees to participate in the assessment system of colleges and universities to obtain credits and certificates. This is what colleges and universities are thinking about. For example, at present, some MOOC companies cooperate with some colleges and universities, and pay a certain fee after completing the intelligent detection of MOOC platform in the process of learners' learning. The achievements obtained in MOOC will be transformed into the credits of the credit system of the cooperative schools, and the certificates will be obtained after participating in the third-party monitoring assessment.

This is an education model that may appear in the future.

It mixes online learning with campus credit system to reduce costs and make more people accept higher education. It also increases the proportion of educated people in the world and promotes the popularization of higher education in the world. Even if this learning method is different from the traditional university, the experience of students may change, but from another perspective, it may be that more students have the right to choose. Different students' learning conditions and family conditions are good or bad. Teaching students in accordance with their aptitude may be more suitable for some students.

4. THE IMPLEMENTATION OF OPEN ONLINE LEARNING IN COLLEGES AND UNIVERSITIES

A mature education model is bound to be sustainable development. For the emerging online education, a feasible business model is crucial. In recent years, many educational powers, including the United Kingdom and Australia, have gradually reduced government funding for higher education institutions, and higher education institutions have begun to attach importance to students' tuition fees to carry out the operation of the University. The new business model provided by MOOC provides a new opportunity for colleges and universities. While considering how to ensure that online learning guarantees the learning of learners, it also has a practical business operation mode, which not only attracts students, but also meets the financial needs of the University.

For many years, higher education has been in a stable state, although the rapid development of online learning still can not shake the status of colleges and universities in education, how to integrate the two is the focus of government thinking. The proportion of online learning in the campus has always been relatively small. In the eyes of the vast majority of learners and universities, online learning is an experimental way, and most of the time it is only regarded as a sideline. However, after the UK failed to launch ukeu in 2003, the society has a new view and a more mature cognition on online teaching, and has no longer resisted the application of online teaching in Colleges and universities and has a strong interest.

Economic globalization has led to the trend of studying abroad. Under this background, online education can provide learners with lower learning costs and technical support across time and space, which is a new opportunity for countries all over the world to expand new overseas markets. With the rapid growth of the global population, higher education is very important among the young freshmen. With the economic recession after the economic crisis, countries increase the pressure of colleges and universities through good market competition, which makes online teaching more useful.

5. CONCLUSIONS AND SUGGESTIONS

With the progress of science and technology, online education technology gradually tends to be mature. After the birth of MOOC, it has a great impact on the existing education market. MOOC platform not only provides a new reform idea for higher education, but also enriches the business profit model, and promotes the development of education all over the world. Let's look at the future

development of education with a new perspective. MOOC has a direct impact on the education mode of universities in the world, including top universities, so that education is no longer limited to time, space and language. To give more learners a different learning mode to choose from, and the gradual integration of traditional education with the university to balance the campus teaching and online teaching while thinking about the new teaching mode. The combination of the two takes the essence to discard the dross, so that the relationship between learners and universities will be more harmonious. For the future education has brought new opportunities and challenges.

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Application Analysis and Development Strategy of Cloud Computing Technology in Modern Agriculture

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Abstract: In recent years, cloud computing technology has been developed rapidly and applied in all walks of life. Due to its outstanding computing function and data storage advantages, the promotion and use of cloud computing technology can effectively improve the efficiency of information use, maximize the use of resources and optimize the allocation of resources. In recent years, with the gradual popularization and application of cloud technology in modern agriculture, the pace of digital transformation of modern agriculture is accelerating, which promotes the transformation and upgrading of modern agriculture.

Keywords: Cloud computing technology; Modern agriculture; Application; Development; Strategy

1. INTRODUCTION

In recent years, with the maturity of cloud technology and its powerful storage and computing performance, cloud computing technology and other emerging technologies are becoming the new driving force for the transformation and upgrading of modern agriculture [1]. All localities actively rely on Farmers' cooperatives and other carriers, actively rely on the Internet, cloud computing and artificial intelligence and other modern information technology to promote agricultural digital transformation, and achieved positive results. Exploring the application of cloud computing technology in modern agriculture will help to further promote the transformation and upgrading of traditional agriculture and further enhance the connotation of modern agriculture development.

2. ANALYSIS OF THE NECESSITY OF CLOUD COMPUTING TECHNOLOGY IN MODERN AGRICULTURE

With the acceleration of the transformation and development of traditional agriculture, the construction of agricultural informatization has become a new commanding height of agricultural and rural development. In the new era, we must vigorously develop modern agriculture, speed up the pace of agricultural and rural informatization construction, and apply various information technologies such as cloud computing and big data to the process of agricultural production, operation and construction, which is the internal requirement of building a moderately prosperous society in an all-round way [2]. At present, information technology represented by big data, cloud computing and Internet of things is accelerating the integration with traditional agriculture, further boosting the development and shaping of online

agriculture. Especially since entering the new era, informatization has become a leading force in the transformation of agriculture and rural areas. Major countries in the world have begun to lay out agricultural and rural informatization and seize the commanding heights of future agricultural development. Accelerating the effective integration of information technology such as cloud computing technology and modern agriculture has far-reaching practical significance for the development of "agriculture, rural areas and farmers" in the new era and the realization of high-quality development.

At present, the development of agricultural informatization in China has gone through more than 30 years. With the wide application of new generation information technologies such as Internet of things and cloud computing in the agricultural field, technologies such as agricultural cloud computing, agricultural sensor and Internet of things, nondestructive testing of agricultural product quality and safety, intelligent identification and control of agricultural robots, and automatic intelligent plant and animal factories have been formed. However, compared with the developed countries and regions such as the United States, Japan and the European Union, there are still many gaps in the development of agricultural informatization in China. A number of core technologies are still in the primary application stage, and the overall development level is more than five years behind the developed countries. It is not enough for technology to participate in agricultural management, operation and service in an all-round way. Therefore, in the face of the general trend of the development and application of agricultural information technology in the world and the practical needs of the development of "agriculture, rural areas and farmers" in China, we must speed up the popularization and use of cloud computing technology and other new generation information technology in modern agriculture according to local conditions, and constantly promote the realization of connotative mode of modern agriculture in China development.

3. DEVELOPMENT STRATEGY ANALYSIS OF CLOUD COMPUTING TECHNOLOGY IN MODERN AGRICULTURE

As mentioned above, cloud computing technology has broad application prospects in modern agriculture. What we need to do at present is how to better combine it with the actual needs and long-term development of China's

current and future agricultural development, so as to better promote the integration of the two and promote the high-quality development of China's modern agriculture. We should focus on the following points

3.1 Seize the opportunity to speed up the technology supply of cloud computing technology in the development process of modern agriculture

At present, the connotation of modern information technology represented by Internet of things and cloud computing technology is constantly deepening. Traditional agriculture is also accelerating the transformation and upgrading with the help of cloud computing technology. Further increasing the application of cloud computing technology in modern agriculture is of great significance to optimize and improve China's agricultural production structure and boost the deep reform of agricultural and rural areas, but it should be improved. We can see that China is still facing a series of problems in the process of promoting the application of cloud computing technology and other new generation information technology in agriculture, especially in the lack of technology supply capacity and the poor progress of some core technologies. For example, the core chips are still relatively dependent on imports, and the lack of innovation ability of sensor research and development is relatively prominent, which affects the cloud computing technology in modern agriculture. Therefore, it is necessary to strengthen the research and development of cloud computing technology in modern agriculture, accelerate the breakthrough of core technology shackles, and lay a solid technical foundation for accelerating the in-depth application of cloud computing technology in the development of modern agriculture.

3.2 Precision service, accelerate the provision of agricultural technology and knowledge service platform for key groups

To further promote the use of cloud computing technology in modern agriculture, we must speed up the introduction of more accurate and personalized agricultural services for agriculture, rural areas and farmers [3]. We should focus on the combination of cloud computing technology and the whole process application of modern agriculture, accelerate the pace of innovation of intelligent agricultural products, accelerate the research and development of a number of mature agricultural intelligent perception, control and independent operation of major technical products, and focus on the huge demand for increasingly accurate and personalized agricultural farmers and new agricultural business entities in relevant regions. Build a platform of agricultural knowledge and agricultural technology service for the whole process and whole link of modern agricultural production, life, service and other fields, and provide them with efficient and convenient agricultural technology knowledge service characterized by audio-visual combination.

3.3 Talent support, accelerate the cultivation of more high-

quality modern agricultural information talents

Cloud computing technology is an emerging information technology, and China's talent reserve in this area is insufficient. With the gradual promotion and use of cloud computing technology in the whole field of modern agriculture, the lack of relevant technical talents, especially rural practical talents, has gradually exposed, which has become one of the biggest constraints to further promote the use of cloud computing technology in modern agriculture. Under the new situation, the major relevant colleges and universities as well as the major higher vocational colleges should speed up the cultivation of cloud computing technology and other new talents for the development of modern agriculture, speed up the pace from the aspects of specialty setting, teacher allocation, talent training mode, etc., focus on training more high-quality modern agricultural information talents, and strive to lay talents for the further use of cloud computing technology in modern agriculture under the new situation Basics.

4. CONCLUSION

In short, cloud computing technology, as one of the most revolutionary emerging information technologies in recent years, has a far-reaching impact and important significance in the transformation and upgrading of modern agriculture. The state and governments at all levels should take the improvement of modern agricultural production efficiency and the transformation of agricultural development mode as the goal, and continuously promote the application of cloud computing technology in modern agriculture in a wider scope and a deeper degree by accelerating the construction of cloud computing technology infrastructure, strengthening the training of professional talents, and accelerating the technology supply and research and development of cloud computing technology in the process of modern agricultural development. To promote the development of modern agriculture with high quality.

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Talking Art in Student Management of Counselors in Higher Vocational Colleges

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Abstract: In the study and life of higher vocational colleges, the distance between Counselors and students is the nearest. We should not only care about the students' academic development, but also care about whether students encounter difficulties in their daily life. All of these works are based on the effective communication between Counselors and students, which tests the Counselor's conversation skills. Especially the contemporary students growing up in the information environment, because they receive more diversified information education, have more diversified ideas, and pay more attention to personalized expression, which puts forward new challenges for the communication technology of counselors. In this article, we will take the conversation art of counselors in student management as the core, and carefully analyze how to better communicate with students.

Key words: Vocational colleges; Counselors; Student management; Talking art

1. INTRODUCTION

With the development of the times and the maturity of the economic system, the requirements of the society for high-quality talents are more stringent, not only requires superb professional skills, but also requires good moral quality. Counselors in the student management work, also shoulder the important task of Ideological and moral education for students, because ideological education is based on the ideological level, need students to accept from the heart, which requires counselors and students to establish a harmonious and equal friendly relationship, through the art of talking to connect students' hearts, so as to have a deep impact on students' thinking, and high Chao's art of conversation is also conducive to the smooth progress of counselors' daily work.

2. THE PREPARATORY WORK OF CONVERSATION ART

2.1 Pay attention to the timing of the conversation

When the same words are spoken at different times, the effects of students' emotions are different. For example, for students of this age, the germination of heterosexual favor is a natural thing, but due to the volatility of youth love, students have a great probability of being lovelorn, and then affect their learning activities due to out of control emotions. At this time, teachers can not comfort students at the first time, because students' thoughts are often at the top of their horns at this time Students should be left with enough self buffer time, so that students can think and heal by themselves. If students have not come out after two or three days, teachers should give proper guidance.

2.2 Pay attention to the place of the conversation

The choice of the location of the conversation is also very important. The environment has a great impact on people's subjective experience. Many counselors like to communicate with students in the office. This is a very wrong idea, because the office environment will remind students of the distance between students and counselors, and emphasize the fundamental identity of "counselor", so that students can not open their hearts to talk Words. At the same time, the number of conversation places is also an important factor. If we want to encourage education and stimulate students' internal sense of honor, it is no doubt that the place with more people is more suitable; but if it is to carry out critical education and guidance education for students, it is no doubt that places with fewer people are more suitable and can encourage students to accept the advice of counselors, which will frustrate students in places with more people Weak self-esteem leads to students' rebellious psychology, which makes students not only not correct their mistakes, but also make them go further and further on the wrong road.

2.3 Focus on the topic of conversation

When communicating with students, counselors often don't go straight to the topic. Instead, they should first communicate with students some easy daily trifles, shorten the distance between them and reduce their inner prevention consciousness. However, counselors should also realize that all the contents of the conversation serve the theme of the conversation. We must not neglect the small and neglect the big and pay attention to the students' close distance Let the theme content go lightly, leading to students' feeling for the theme is not deep, can not form a good education effect [2].

3. THE SPECIFIC FORMS OF CONVERSATION ART

3.1 Counselors should maintain a good external image

The success or failure of a conversation process, the first impression will play a great role. In the process of communication, one is neat and the other is untidy. It is unnecessary for students to say more about who has a better impression. Therefore, first of all, counselors must ensure that the clothes are neat and tidy, so that students feel comfortable, so that students are more willing to communicate. Secondly, the impression is not rigid, but will change at any time with one's words. Even if a counselor's clothes are neat and tidy and leave a good impression on students, with the deepening of communication, the Counselor's words and deeds gradually become vulgar, which will gradually reduce the Counselor's score in the students' mind. The maintenance of external image is not only reflected in clothes, but also in one's speech and behavior. Counselors should always

pay attention to their own words and deeds [3].

3.2 Equality and respect are the key to open students' hearts

In the process of talking with students, some counselors like to use the perspective of the past person to guide the students, asking them how to do it, instead of explaining why they do it. Everyone has a rebellious psychology, what's more, for young vocational students, the wrong way of communication of counselors can not achieve the educational effect, but will make students want to fight against counselors more. The more counselors want students to do, the students will not do so; the less counselors want students to do, the more students will do. Therefore, when communicating with students, we must treat students as an equal individual and give them due respect. At the age of students, they hope to be recognized by others, especially parents and teachers. The equal treatment given to students by counselors will become a stepping stone for communication between Counselors and students, which can effectively open the door of students' hearts and let students tell their most real ideas to counselors.

In addition, the student's heart is very sensitive, perhaps the Counselor's casual expression, will be understood by the students as a manifestation of disrespect for themselves, so as to make students' psychological prevention more closely. Therefore, when talking, counselors should pay attention to their facial expressions, not only not to keep a face, so that students feel unfamiliar; also not to be too enthusiastic, so that students feel stunned, but to maintain a relaxed and natural manner, so that students feel like spring breeze. However, under some special circumstances, the facial expression of the counselor can not always maintain a relaxed and self-

contained manner. When students are sad and sad, if the Counselor's attitude does not change, it is easy to cause misunderstanding among students, and the Counselor's attitude should change towards sadness and establish empathy with students [4].

4. CONCLUSION

For vocational college students, although most of them have grown up or are on the edge of adulthood, they have been living in the "ivory tower" on campus, their social experience is extremely limited, and their cognitive ability of things is often weak. In addition, students' ideological immaturity leads to their great deficiency in their ability to resist pressure and resist bad temptation. If counselors want to protect the healthy growth of students, they must face many problems, and because of the students' self sealing characteristics after encountering difficulties, it is necessary for counselors to timely detect the abnormal phenomenon of students and communicate with students effectively, so as to help students out of the haze.

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Research on Innovation of Development Model of Product Service Supply Chain

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Abstract: This article first summarizes the various stages of the supply chain development, and analyzes the shortcomings of the traditional product supply chain and service supply chain, and then demonstrates the product service supply chain in which customers participate in the whole life cycle. Its topology has been systematically analyzed. The analysis found that in the product service supply chain, customers have become an indispensable subject, and at the same time, each subject can achieve value co-creation through sustainable development. Finally, the article further puts forward feasible suggestions that are beneficial to the development of product service supply chain.

Keywords: Product service supply chain; Customer participation; Topological structure

1. INTRODUCTION

The integration of manufacturing and service industries has become the "new normal" for corporate transformation. In China, service-oriented manufacturing has increasingly become the strategic development direction of manufacturing companies, and its core is that customers participate in the product design and service innovation of manufacturing companies. Activities, this model effectively integrates products and services in the process of encouraging customer participation, and finally forms an integrated solution to customer problems. Due to the transition from production-oriented manufacturing to service-oriented manufacturing, the operation mode of the traditional supply chain has changed to the mode of product service supply chain; and the embedding of service elements and customer participation have led to the flexibility of the product service supply chain business process of manufacturing companies Diversification.

2. LITERATURE REVIEW

The concept of supply chain has been around for a long time, and it has a good guiding role for the rational allocation of corporate resources and the shaping of corporate advantages. In 1950, the logistics ideas involved in the procurement, maintenance and transportation of military equipment led to the concept of supply chain. Later, the prosperity of the industrial age applied this concept to the manufacturing industry, thus creating a product supply chain. The rise of the service economy has once again expanded the boundaries of the supply chain, and the emergence of the service supply chain has laid a solid foundation for improving the process of the service industry. Until recent years, the service-oriented concept of manufacturing has gradually become the strategic development direction of enterprises, making service-oriented ideas promote the restructuring of supply chain

models and realize corporate value creation. In this process, the supply chain has gradually evolved from a product supply chain and a service supply chain to a product and service supply chain that is deeply integrated between the two chains.

2.1 Product supply chain

A typical supply chain structure includes manufacturers, suppliers, distributors, transporters, warehousing, and customers themselves. Each participant purchases, produces, distributes and sells products for the end customers, including all the transportation of goods from raw materials to the final stage Activities involve the circulation of logistics, value flow, and information flow [1]. In order to improve the operational efficiency of the organization, it is necessary to coordinate and integrate the key parts of this process-transportation and storage, to form a powerful tool for increasing global market share. Through the integration of many areas of supply chain management, it can be found that the development of supply chain has the characteristics of the times, and the focus of attention has undergone changes in material flow, information flow, integration, internal and external relationship networks, risk, performance, and supply network governance. Related research mainly focuses on product flow, relationship coordination, and benefit optimization. The main body of supply chain research is a variety of products, so the research focus is more on manufacturers. Since the supply chain includes a series of complex processes in the entire life cycle of a product, such as design, manufacturing, transportation, storage, and sales, it involves many suppliers, manufacturers, and retailers, and each subject has product-related activities in it. A network with a complex relationship structure is formed. In this network, there are multiple supply chains. For their own interests, each subject in the supply chain network often conflicts with other subjects in the network that have a competitive relationship with interests, and each subject is dependent on each other, and competition and cooperation coexist. Only with a certain degree of cooperation can we better maximize the profits of the entire supply chain. How to coordinate the competitive dependence of each subject, balance the interests of each organization member and the supply chain, and achieve the overall optimization is an important concern for maximizing the value of the supply chain network. Although the focus of the supply chain is constantly changing, in the face of the complex market environment, many scholars have realized that if they only focus on product-led supply chain management, it will be difficult to cover the market comprehensively, so that they cannot meet the diverse needs of customers. Therefore, academia

and entity companies continue to segment the market, expand the scope of research, and explore service supply chain management in depth.

2.2 Service Supply Chain

Service supply chain, as the name suggests, service is the main body, the process of service creation is inseparable from customer participation. Without customers, there will be no service. Baltacioglu define the service supply chain system as "a network of suppliers, service providers, consumers and other support units, which perform the function of transaction of resources required for production services, transform these resources into support and core services, and deliver to Customers provide these services [2]." Demirkan described the service supply chain as a two-way system consisting of customers, service providers and initial service producers, and defined the application service supply chain as a system composed of three parties, that is infrastructure service production [3]. Merchants, retail service providers and customers. Following the arguments of the above scholars, in this part of the research on the service supply chain, the products provided are "pure services", and the supply chain ideas are applied to the supply chain system formed by the relevant service industries. By integrating the application of the supply chain in the service industry, it can be found that the main bottleneck in the implementation process is that the asymmetry of information leads to uneven resource allocation, the positioning of participants is not clear, and the intangibility of services leads to problems such as dynamic market. Enterprises need to build an inclusive

Table 1 Product Service Supply Chain Research

Name	Manifestation	aims	references
Product-based service supply chain	PSS provides	Service supply and demand integration[5]	Wang Kangzhou
Service-oriented product supply chain	Provide a complete product service plan	Coordination of product and service supply chain[6]	Dan Bin
Productive Service Supply Chain	Integrate all relevant resources of service companies and suppliers to build a supply chain oriented to the PSS system	Meet specific customer service needs[7]	Mauil
Manufacturing Service Supply Chain (MSSC)	Provide the best service combination solution with the best service quality value	Optimize the manufacturing service supply chain[8]	Kurata

At present, relevant research on product service supply chain is mainly analyzed from the perspective of product supply chain or service industry. One is based on products, using related after-sales service, financial services, information services, etc. as auxiliary means. For example, Zhang studied the product service supply chain composed of manufacturers and retailers[9]. Manufacturers provide products based on Provide free basic after-sales service, and retailers provide paid after-sales service, believing that there is a mismatch between the optimal service level that meets customer needs and the service level that maximizes the profits of the relevant enterprise. Li studied a supply chain composed of manufacturers and retailers [10]. Retailers are responsible for selling integrated solutions to customers. They analyzed the impact of service prices on the supply chain under different decision-making modes. Most of this part of the research follows the context of product and service separation. Research on the supply chain of products and services. The other is the product service supply chain based on the

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cooperation platform, integrate relevant resources, establish a common service module, and combine industry characteristics to better integrate supply chain management ideas into the service industry.

Based on the degree of attention paid to products and services in supply chain management, Lin proposed a service classification matrix, dividing the service supply chain into general supply chain, product supply chain, service supply chain and service-oriented supply chain [4]. So far, the research on product supply chain and service supply chain has been very mature. The main body of existing service supply chain management research focuses on intangible services. It is located in the first quadrant of the product service classification matrix and has the characteristics of high service and low product attention. Products and services have heterogeneous characteristics, dividing the market into two different subjects, and in the context of manufacturing servitization, a single supply chain model is difficult to meet the heterogeneous needs of customers, and products with high product attention and high service attention Service supply chain is the direction that should be paid attention to under the background of the new era, and it is also the focus of this article.

2.3 Product service supply chain

Although there are many existing researches on the concept of product service supply chain, it still lacks a generally accepted concept. This article analyzes the thoughts of many authoritative scholars (Table 1) in order to form a clear concept of product service supply chain.

perspective of the service industry, which combines the idea of the product supply chain with the service industry. Yao Shujun constructed a product service supply chain composed of functional service providers, service integrators and customers, and studied the impact of changes in service demand on supply chain profits [11]. He Zheng studied the product service supply chain composed of product service integrators and product service providers, and considered the behavior analysis of decision-makers in the context of information sharing incentives [12]. Related research completely understands the product service supply chain in accordance with the operation mode of the service supply chain, which is still based on the product, but the service is in a dominant position between the product and the service. In the context of manufacturing servitization, the product service supply chain is a functional network structure that delivers the product service system to customers. It pays more attention to the integration and integration of service capabilities. Integrators should meet customers' products

to the greatest extent by integrating upstream capabilities. Service integration needs to realize the value proposition of each member of the supply chain and achieve value co-creation. It is no longer necessary to distinguish between products and services, but to integrate and integrate products and services into a new service concept, providing the best service combination solution with the best service quality.

3. RESEARCH ON INNOVATION OF PRODUCT SERVICE SUPPLY CHAIN

3.1 Formation of product service supply chain network

The lack of professional knowledge in product manufacturing and service provision has led to the ambiguity and chaos of the customer's statement of the problem. In order to achieve effective solutions to customer problems, manufacturing companies need to refine customer problems, and customer participation is for this. The solution of a difficult problem provided help. In the service-oriented manufacturing model, customers participate in "manufacturing" and "value creation", which helps identify problems, design integrated solutions, and integrate product services. However, the different types of customer needs make the degree of customer participation has a difference. In the process of solution

design, customers participate in collaborative design; in the process of providing solutions, customers, as one of the main members of the supply chain, creatively participate in cooperation; after solutions are provided, customers experience the effects of product use and participate in professional Product maintenance and repair. In addition, compared with the traditional supply chain network, the multi-category needs of customers have triggered changes in the number, type and behavior of cooperative enterprise interactions on the product service supply chain network, such as the addition of service providers and integrators at different stages. Therefore, in order to solve customer problems in depth and meet the needs of different types of customers, it is necessary to construct a product service supply chain network in which many service-oriented manufacturing entities including customers participate in interaction, analyze the network characteristics and operation modes under different customer needs, and strengthen the design , Seamless connection from production to consumption, to achieve precise matching of supply and demand.

In summary, the analysis of the reasons for the formation of the product service supply chain network is shown in Figure 1.

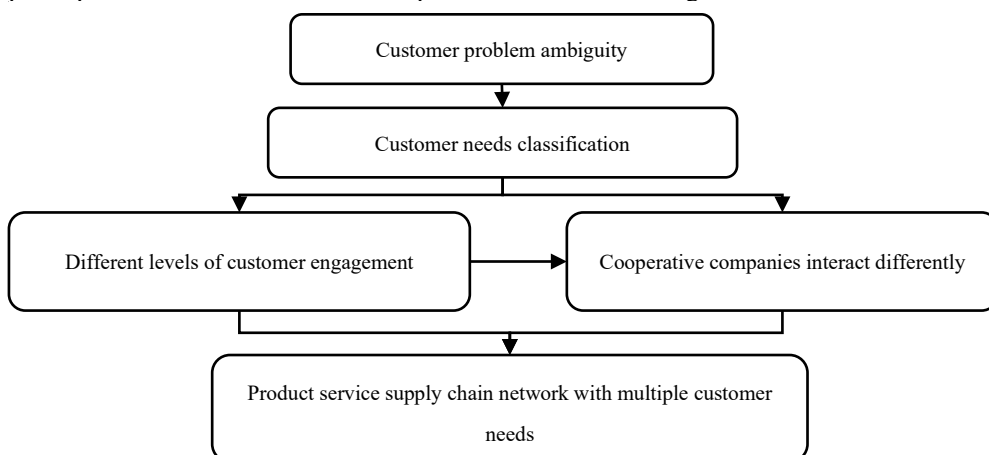


Figure 1 Analysis of the reasons for the formation of product service supply chain network

3.2 Customer demand classification and participation level analysis

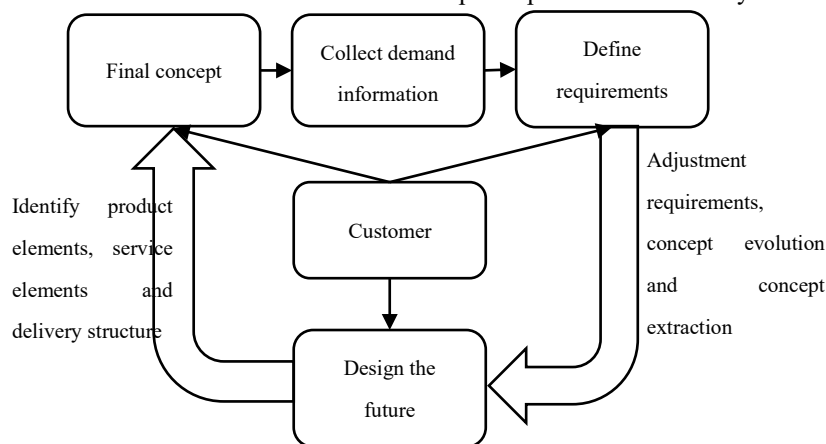


Figure 2 Customer demand analysis model

Different customer needs determine the difference in the degree of customer participation, which in turn determines the different manifestations of the product service supply

chain network, so it is necessary to analyze customer needs. As shown in Figure 2, customer needs are affected by the market environment and technological

environment, and change over time. The leading enterprise in the product service supply chain network—service-oriented manufacturing enterprises must identify and update customer needs many times. According to the different ways of customer participation, manufacturing companies also have differences in identifying customer needs.

In response to the service needs in the aftermarket product use stage, such as product maintenance, upgrades, and spare parts management services, due to lack of professional knowledge and experience, customers have a low degree of participation in service deployment, but describe the problems to the service provider or manufacturer. Then the suppliers participating in service deployment are mainly manufacturers and service providers.

With the development of information and technology, customer problems have gradually deepened. Customer needs come from professional customization of products. Service elements are considered in the manufacturing process of products. Such services are called customized needs. In order to achieve effective solutions to their own problems, customers will actively participate in service deployment, and jointly decide with manufacturing service integrators and service providers to customize a product service portfolio that meets their needs. Then the main enterprise participating in service deployment is Manufacturing service integrators and service providers, etc.

Considering the future situation, customized services can no longer meet customer needs. Customer needs will extend from the product service design stage to the after-sales maintenance stage, such as one-stop service requirements such as financial leasing and turnkey projects. Customers actively participate in every service deployment. At this stage, providers participating in the one-stop demand include manufacturing service integrators and service providers.

3.3 Participate in the analysis of the operation of the product service supply chain network throughout the life cycle.

The whole life cycle participation product service supply chain network is mainly composed of raw material providers, service integrators, product manufacturing integrators, service providers, product service sellers and customers. This network provides customers with R&D-oriented services, such as development services, design and construction services, etc., and has been extended to after-sales service. Customers participate in it from the R&D and design stage, and have strong information exchanges with product manufacturing integrators, service integrators, and product service sellers. According to the service blueprint technology, the front-end area of the product service supply chain network involved in the entire life cycle includes all service links from design to after-sales, and the back-end area is only the supply of raw materials. The front-end area activities include product + service design, manufacturing, sales and after-sales service activities. Product manufacturing integrators and service integrators design and manufacture products and services in full accordance with customer needs. There is a strong interaction between the customer and each subject in the network, and the production and supply of raw materials is a supporting process. The topology is shown in Figure 3. The resources that a product service supply chain network should possess during the whole life cycle include manufacturing resources (such as material resources, process technology, etc.), service resources (such as information resources, logistics resources, etc.), and customer resources (customer needs, customer knowledge, customer experience, etc.), customers have participated in almost all activities in the network. Therefore, it is necessary to integrate and configure network resources under the customer-led logic, which is suitable for providing customers with high-quality consulting, guidance, research and development, and solution implementation services for their specific problems. Network entities should establish an environment of long-term cooperation and trust with customers, share information in a timely manner, and realize the co-creation of network value.

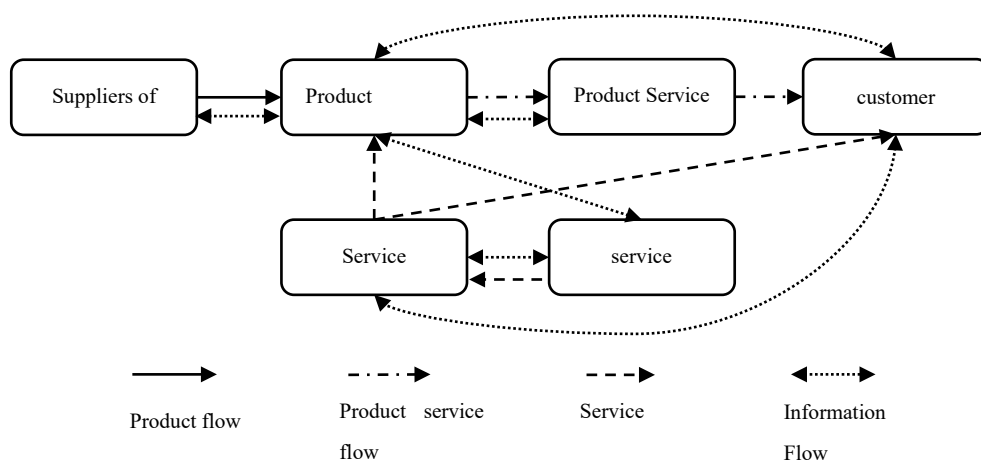


Figure 3 Participate in product service supply chain network topology in the whole life cycle

4. CONCLUSIONS AND RECOMMENDATIONS

This paper builds a product and service supply chain network framework that can meet customer needs to adapt

to the development of service-oriented manufacturing models, and break through the limitations of service-oriented manufacturing research that often focuses on a

single enterprise. Through the analysis of this article, it can be seen that in the product service supply chain network, customers will become indispensable network entities. At the same time, the network entities will promote the sustainable development of the network through modern science and technology, and ultimately realize the value of the network. Based on this, this article puts forward relevant suggestions for reference.

4.1 Attach importance to customer participation and enhance the position of customers in the product service supply chain network

Guided by customer problem solving, it emphasizes the importance of customer participation in design and interactive services, builds a product service supply chain network that meets customer needs, integrates customer resources into the network, and realizes value creation.

4.2 Apply modern technologies such as the Industrial Internet to promote the sustainable and coordinated development of the product service supply chain network

The product service supply chain network with increased service flow and value flow is more complicated and diversified, and the interaction between node subjects tends to be frequent, and the application of industrial Internet can accelerate the remodeling and reconstruction of the product service supply chain and achieve sustainable development.

4.3 Constructing the value co-creation realization and guarantee mechanism of the product service supply chain network

Realizing value co-creation among multiple entities is the ultimate goal of restructuring the supply chain network. The product service supply chain network architecture provides a carrier for the value co-creation of network participants. Building a network value co-creation realization and guarantee mechanism has become the key to be further resolved problem. Therefore, the construction of a service-oriented manufacturing supply chain network framework should first build a value co-creation realization mechanism by integrating and integrating manufacturing resources and service resources in the network, matching resource integration with utility value, and realizing the optimal network value utility. Configuration status of each resource. At the same time, when the co-creation value is not up to the standard, the network value co-creation can be realized through the expansion, reconstruction and complementation of network resources. Second, the construction of a service-oriented manufacturing supply chain network framework should build a network value co-creation guarantee mechanism through the balanced distribution of co-creation value, establish a value coordination relationship between different network entities, and determine the value propositions of the participants at each layer of the

network To ensure the stable development of the product and service supply chain network, the network value is distributed in a balanced manner and the network reaches a balanced state.

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Analysis and Research on Employment Trend of local College Graduates

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Abstract: Based on the employment trend of local college graduates, this paper investigates the employment direction and employment industry of local college graduates, this paper summarizes the employment trend of local college graduates, so as to strengthen the career planning of college students and strengthen the employment guidance force, and so on.

Keywords: College graduates; Employment

1. INTRODUCTION

After entering the 21st century, China's higher education has ushered in a large expansion, the number of graduates is increasing year by year, reaching 8.74 million by 2020. One of the impacts is the increase of employment pressure, and the overall scale of jobs in the whole employment market is becoming increasingly tense. College graduates are faced with a severe employment situation, and the fresh graduates are faced with a dilemma: to go to the workplace to fight for a career, or to continue to pursue further education? In order to understand the employment concept of college students, but also in order to carry out work more directional and guidance, help students better find their own position.

2. EMPLOYMENT DIRECTION OF GRADUATES

The author did a survey, in which 66.47% of the students tend to engage in the work related to their major. With the deepening of their study, some changes have taken place with their original choice of major. When college students face employment choice, the first thing is not survival or welfare, but the most important development prospect.[1] From the current social development observation, nearly one third of college students choose to find a job after graduation, find their own foundation, and then seek the most suitable job for their own development.

3. EMPLOYMENT TREND OF LOCAL COLLEGE GRADUATES

3.1 Most of the college graduates are confident in their major, and they are also more concerned about the employment situation of their major and the requirements of the employment unit. This shows that college graduates hope to have a communication opportunity with employers. Career orientation and job seeking experience have become the focus of College Students' attention, which shows the necessity of offering employment guidance courses in schools.

Most college students tend to obtain employment information from on-site job fairs and campus job fairs, accounting for about 90%, while the current commonly used online recruitment accounts for only about 8%. The awareness rate of employment information publishing websites is not high, and the ways to obtain employment

information should be diversified.

3.2 In job hunting, college students think that the most important thing is ability. Almost all students think that ability is the first in job hunting. Nearly half of the students think that the embodiment of ability includes communication ability and vocational skills certificate. At the same time, nearly half of college students also think that the lack of practical ability is the biggest difficulty they encounter in finding a job. At present, there are few opportunities for practice in Colleges and universities. Under the current higher education system, college students should take advantage of their spare time in college life to enter the society and practice more, and cultivate their practical ability. Of course, solid professional foundation and other knowledge are also very important for 70% of college students.

3.3 In the face of increasing employment pressure, will it increase the possibility of further education? In combination with the current international and domestic environment, many industries have suffered a certain impact. The already tight job market has made it harder to get a job. In the survey, more than 40% of the students tend to work late for further study because of the influence of the employment environment. The expansion of China's higher education has led to an unprecedented increase in the scale of higher education. The number of college students trained ranks first in the world. It is inevitable that there is an asymmetry between talents and market demand. Further study has become the choice of more and more college students. In addition, local colleges and universities continue to implement the undergraduate training project, but also hope that more and more college students continue to study, increase the competitiveness of college students, but also an important indicator of the current quality of university training.

4. COPING STRATEGIES FOR EMPLOYMENT TREND OF LOCAL COLLEGE GRADUATES

4.1 Career planning should run through the whole university stage. In the survey, nearly two-thirds of college students hope to engage in professional related work, which has a great relationship with their original choice of major. However, from the survey, it is also found that 80% of college students lack a clear career planning for college life, although colleges and universities offer career planning related courses But the actual effect is not ideal. Many career planning courses are offered in lower grades, and some students are not familiar with the concept of career. In addition, most of the teachers engaged in this course are part-time and lack of certain work experience, so it is difficult to carry out targeted guidance. Therefore, it is necessary to continue to strengthen career planning

guidance for college students. Through the teacher's foreign exchange, we can constantly enrich the teaching staff and increase the opportunities for students to plan and practice. Instead of simply completing a course, we can stimulate the enthusiasm of college students to participate in personal career planning through career planning competition.

4.2 All round development, enhance the competitiveness of local college students, college graduates want to reflect their own value through work, practical ability is not strong and the lack of certain professional skills has become an important pressure restricting graduates to apply for jobs. In the survey, most of the graduates care about the future development space, accounting for about 80%, ranking the second is the exercise of personal ability. Among the respondents, they pay attention to the improvement of their professional skills and future career development direction in their own career, not simply for the current interests.

In the new era, college students must constantly improve their professional skills, pay attention to the improvement of practical ability, and participate in social practice and part-time work related to their major, not only limited to books and theories, but also to combine practice with theory, so as to prepare themselves for adapting to the society in the future.

In order to enhance the competitiveness of local college students, we should strengthen the career planning guidance of college students, let them choose their own direction, create opportunities to increase college students' understanding of further education, establish a special exchange group, build a platform, and carry out experience exchange meetings, so as to increase their chances of success.

5.CONCLUSION

The future development of college students can't be solved simply by teaching career planning and career guidance courses. Not to mention that "the gap between employment

guidance service and students' expectations is large, which leads to students' failure to get systematic and comprehensive guidance during their university stay." [2] The career development of college students is a systematic project. Help college students establish their own direction of life development as soon as possible after admission, and make plans for it, and make adjustments in their future study and life because of their needs.

For employers, the practical ability of college students must be placed in an important position. Whether they have social practice experience or not and whether they have cadre experience have become important indicators for employers to consider. In the face of fierce competition, college students should take the initiative, actively participate in social practice, and constantly improve their practical ability. They can also participate in some organizations and associations to constantly hone their comprehensive quality and enhance their competitiveness. In the process of job hunting, college students should not only participate in the on-the-spot job fairs, but also apply for jobs through the Internet. The government provides various convenient conditions for graduates to apply for jobs. College students should combine online and offline to grasp every job opportunity. For college students who lack practical experience, major recruitment websites will publish some internship and part-time opportunities, which is also to accumulate experience for the next job search.

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On the Interest Orientation of Children's English Teaching and the Cultivation of Children's Interest in English Learning

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Abstract: With the deepening of education reform, more and more people begin to realize the importance of English learning for the growth and development of students, especially in their early childhood and childhood. The guidance of their interest in English teaching and the cultivation of their interest in learning can effectively strengthen their English teaching enlightenment and effectively avoid learning difficulties caused by non-native English Students' learning influence, further enhance their learning interest and enthusiasm, cultivate their good English learning habits, and lay a solid foundation for their future continuous English learning. Based on this background, this paper discusses the interest orientation of children's English teaching and the cultivation of children's interest in English learning for reference.

Keywords: Children's English teaching; Interest oriented; Children's English; Learning interest

1. THE VALUE OF GUIDING AND CULTIVATING CHILDREN'S INTEREST IN ENGLISH LEARNING

1.1 Promote children's attention to English learning

The "attention" in essence refers to the psychological activities generated by students' pointing and concentrating on specific objects. It is the fundamental factor to effectively improve the quality and efficiency of students' learning. It can promote students' conscious input of English as a language, thus ensuring the recognition, storage and processing of brain cognitive mechanism, and improving students' second linguistics as a whole. However, due to the influence of children and children's age and mental development, they do not have good self-management and restraint ability, so it is difficult to keep their attention for a long time. Their curiosity and curiosity determine the promotion of learning interest. Therefore, teachers must pay attention to the guidance and cultivation of children's and children's English learning interest [1].

1.2 Stimulate children's and children's positive feelings for English learning

The guidance and cultivation of children's interest in English learning can effectively stimulate students' positive affective factors, which is of great value to the process of their acceptance of the second language. In a word, if the students keep the conflict from the emotional factors, they will naturally hinder the learning and receiving of the English language. However, if the students can maintain a positive emotional attitude, they will have

a great impact on their English learning and reception. It will make the process of English language learning more smooth, and children and children's actual cognitive level is low, there are still great limitations for their learning of English knowledge, and even some students will form weariness. Therefore, we must strengthen the guidance and cultivation of their learning interest, and further promote their immersion in English language learning.

1.3 Lay the cognitive and emotional foundation for children and children's future English learning

When students can carry out practical English language learning under the guidance of learning interest and enthusiasm, their actual learning experience will be optimized, so as to better strengthen the absorption and exploration of English language in interesting, relaxed and vivid learning emotions. In addition, learning interest can better integrate with students' awareness and intelligence, which is conducive to promoting learning. Students can improve their self-identity, self-confidence and other qualities, so as to better induce their sensitivity to English language and learning awareness, and lay a solid foundation for their continuous English language learning in the future.

2. TO PROMOTE CHILDREN'S AND CHILDREN'S INTEREST IN ENGLISH AND CULTIVATE EFFECTIVE STRATEGIES

2.1 Capture of learning interest

Due to the influence of their own nature, children and children are not driven by subjective interest consciousness. In the actual English learning process, teachers need to play a leading role, strengthen the observation and mastery of students' learning, so as to effectively capture their interest tendency. Based on this, first of all, teachers need to improve and optimize their own teaching habits, which needs to be as far as possible. On this basis, we should strengthen the encouragement, tolerance and guidance for students, and better promote their initiative to participate in English learning. On the other hand, teachers need to improve the monotonous and boring teaching methods and use more advanced teaching methods to promote English learning. In addition, teachers also need to break the limitations brought by textbook knowledge, so as to implement the guidance of life oriented teaching concept, and further strengthen students' familiarity and participation based on students' actual life. Moreover, teachers need to combine the actual situation of students

and personalized Develop characteristics to organize teaching activities, so as to realize the type and form of English learning activities according to students' preferences. For example, some students like to listen to stories and some students like to watch cartoons. Teachers can implement English teaching by combining story telling and role playing, so as to effectively promote the capture of students' interest and guarantee teaching The effectiveness of learning [2].

2.2 Generation of learning interest

Children's and children's interest in English language learning can also be divided into different types according to their core characteristics, namely personal interest and situational interest. In the actual guidance and cultivation of their interest, they often need to experience the transformation process from situational interest to personal interest. Based on this, teachers need to carry out the actual teaching process under the guidance of open teaching principles Do we create diversified interesting and vivid teaching scenes, so as to provide each independent student with the opportunity and platform to develop their own unique interests? At the same time, teachers also need to implement flexible teaching methods. On the one hand, through the combination of diversified teaching modes, targeted teaching can be realized, and opportunities for students to choose independently can be provided On the other hand, teachers can build appropriate incentive mechanism to let students participate in the benign competition, such as carrying out some activities such as word answering, vocabulary relay, English nursery rhyme competition, etc., so that students can get subtle interest generation under the guidance of their own desire to win or lose, so as to better play the value of helping them learn English.

2.3 Maintenance of learning interest

For children and young children, their interest in learning is often three minutes hot. Therefore, in order to ensure the driving force of learning interest on their English learning, it is necessary to ensure the persistence of their interest in learning. Based on this, first of all, teachers need to ensure the integration of teaching design. In detail, it is combined with the teaching resources that students are familiar with and like to see It creates rich and vivid teaching situations,

so as to break the limitation of rote English learning method, strengthen the interaction between students and English language, and on this basis, realize the integration of English language teaching and other cultural contents, for example, integrating English into music teaching, letting students experience the charm of English songs, and integrating English language into English and American countries In the introduction of cultural background, it can be closer to the customs and habits of native English speaking countries, and promote their awareness of diversified English learning; on the other hand, it is also necessary to ensure flexible teaching style, which requires teachers to pay attention to the improvement of their own quality and ability, so as to lead students to appreciate the elegant demeanor of English in language, expression, spirit and behavior To promote their interest in English learning.

3.CONCLUSION

To sum up, for children and children whose age and mind are still in the early stage of development, the guidance and cultivation of learning interest can effectively promote the improvement of students' English learning quality and efficiency. Therefore, teachers need to pay attention to the implementation of this work, so as to promote children and children's initiative and emotion in English language learning, and promote their all-round development.

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Driver Fatigue State Recognition Based on Deep Learning

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Abstract: With the continuous development of social economy and the times, people's living standards and quality have been significantly improved, which makes the domestic automobile business volume show an upward trend, leading to the continuous rise of domestic car ownership data, and the number of domestic drivers. Therefore, it is necessary to strengthen the management of drivers, so as to ensure the healthy development of social transportation industry. With regard to the development of drivers in modern society, we need to pay attention to the problem of fatigue driving, which is easy to cause major accidents. Therefore, we can build a professional fatigue driving recognition system, which can effectively improve the driver's awareness of safe driving, reduce the probability of social traffic accidents, and maintain the safe development of social life. This paper mainly analyzes the driver fatigue state recognition under the background of deep learning, and the research results are only for reference.

Key words: Deep learning; Driver; Fatigue state; Recognition

1. INTRODUCTION

Driving fatigue mainly refers to the driver's continuous operation in the process of driving the vehicle, which is easy to cause physical function to be affected, and then affect the driver's own judgment and response ability, thus causing traffic accidents. Therefore, the domestic transportation industry strictly forbids the occurrence of fatigue driving, so as to maintain the stability of the development of domestic transportation industry. As for the detection of driving fatigue, professional research is mainly conducted from three aspects of driver physiological parameters, vehicle handling information and driver's face image. It can systematically analyze driving fatigue, which plays an important role in the management and development of the future transportation industry.

2. SPECIFIC ANALYSIS AND RESEARCH ON DRIVER FATIGUE STATE

2.1 Detection of driver's physiological characteristics

Through the analysis and research of driver fatigue state, physiological characteristics mainly refer to the driver's brain, heart and muscle and other aspects of electrical signal information, so the relevant technical personnel should first clear the driver in fatigue, these positions of the electrical signal information value, can be used as a follow-up research and development benchmark, for the future development of the transportation industry Important role.

Among them, for the study of driver's physiological characteristics, not only need to observe the reaction of driving, if in the driving process, by external stimulation, physiological characteristics of the signal will react, and the error range is how much, so technicians need to carry out systematic experiments and tests on physiological aspects, so as to ensure the accuracy of physiological signals and professional Sex [1].

2.2 Detection of vehicle operation and operation status

Through the analysis and research of driver fatigue state, we can strengthen the research and detection of vehicle operation and operation state, provide important auxiliary data support for driver driving state, and play an important role in the development of driver fatigue state detection. As the driving state of the vehicle can indirectly reflect the driver's operation ability and concentration, it is also an important part of fatigue state detection research. For example, when the driver drives beyond the specified time, the reaction time and operation efficiency of the driver will be reduced. If there is an emergency, the driver can not step on the brake in time or make correct operation, thus causing traffic accidents.

2.3 Detection of driver's facial features

Through the analysis and Research on the driver's fatigue state, we can strengthen the detection of driver's facial features, and provide relevant data support for the detection of driver's fatigue state. Because people will make actions related to their own state in daily life, and can effectively show people's mental state and reaction ability, relevant technical personnel can strengthen the detection Improve and innovate the detection and identification of driving fatigue state, and update the big data center in time, so as to reflect the professional standardization of driver fatigue state detection and identification system. Through the investigation of modern transportation industry, it is found that the driver's facial features mainly include eye closure, blink frequency, head position, yawn and other data, which can judge the driver's concentration and operation ability. For example, when a driver is in a fatigue state, his head will turn sideways or yawn continuously. This is also the case that the driver's brain is in a state of fatigue. Therefore, professional management is needed to reduce the probability of fatigue driving [2].

3. THE MAIN CONTENT OF DEEP LEARNING TECHNOLOGY

Deep learning technology is based on the concept of deep learning related technology, people can use the method of deep learning to study and manage the related images. In the process of driver fatigue state detection, the application

of deep learning image technology can effectively improve the professionalism and accuracy of relevant data, so as to improve the driver fatigue state detection Scientific nature of identification.

4. THE DEVELOPMENT OF DRIVER FATIGUE STATE RECOGNITION UNDER THE DEVELOPMENT OF DEEP LEARNING

4.1 Recognition and detection of driver's face

Driving fatigue state detection can observe and experiment from the driver's facial features, realize face recognition and face tracking action by collecting images, conduct professional management on driver's face image, and scientifically plan and manage the detected fatigue data, so as to realize driver's face recognition.

4.2 Extraction and detection of driver's face features

Driving fatigue state detection can extract and detect the driver's face features, and can accurately analyze the driver's mental state and mental concentration. At the same time, professional convolution neural network can be used to manage the driver's fatigue characteristics in a professional and scientific way, so as to enhance the importance of face feature detection.

4.3 Dynamic analysis and detection of driver's facial features

Driving fatigue state detection can be dynamically analyzed from the driver's facial appearance characteristics. According to the investigation, the driver's fatigue state is a transitional process. Firstly, the driver changes from sober state to severe fatigue state, and finally to severe fatigue state. At the same time, the driver's response ability to stimulation becomes slow state. Therefore, we can use the time dimension to get the driving result The precise state of member state [3].

5. CONSTRUCTION AND RESEARCH OF DRIVER FATIGUE STATE RECOGNITION MODEL UNDER THE DEVELOPMENT OF DEEP LEARNING

5.1 Increase the utilization of optical flow characteristics in fatigue state detection

The analysis and research of image using deep learning method can increase the use of optical flow features, and can accurately control the driver's awake state and fatigue state. Optical flow can manage the driver's visual movement in a large scale, so as to improve the driver's fatigue state recognition model.

5.2 Using professional related images to promote the construction of fatigue detection model

As for the analysis and research of image using deep learning method, we can strengthen the use of key data in the image, get the depth of driver's fatigue state through the expression of image, and make professional comparison between sober state and fatigue state, so as to obtain high-quality results.

6. CONCLUSION

In conclusion, driven by the rapid development of social economy and science and technology, the economic benefits and development scale of the domestic automobile industry have been effectively developed, and the number of domestic drivers is also increasing. Therefore, the domestic transportation departments need to strengthen the management of drivers and formulate professional management systems and standards, which can effectively reduce the probability of domestic traffic Protect the safe development of social life. Driven by the development of deep learning, we can build a professional driver fatigue state recognition model. Through the research and detection of driver's face, face features, facial appearance features and other aspects, it helps to reduce the occurrence of driver fatigue driving and realize the stable development of domestic transportation industry.

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Steady State Calculation and Analysis of Long-Distance Natural Gas Pipeline Network

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Abstract: Using the research method of combining theory and empirical analysis, the common steady-state simulation calculation methods of gas transmission network are introduced firstly, and then the concrete empirical calculation analysis is carried out. With the help of the principle of minimum pipeline friction loss, a special calculation model is built to solve the problem of slow solution speed caused by improper calculation of initial value.

Key words: Natural gas; Long distance pipeline network; Steady state calculation

1. INTRODUCTION

The important basis for the design of natural gas pipeline network is the steady-state analysis results of natural gas pipeline network, and it is also an important theoretical basis for optimizing the operation of natural gas pipeline network system and determining the optimal reconstruction and expansion scheme [1]. After the steady-state and working condition analysis, we can fully understand the working state of the pipe network and master the operation law of the system. A comprehensive evaluation on the safety and economic performance of natural gas under different working conditions is carried out. At present, computer technology has been popularized in our life, and the steady-state analysis of pipe network has also introduced a new calculation method, which has developed to a new stage [2]. Calculation and analysis of large and complex pipe network steady state has become a reality. But there are still some theoretical and practical problems to be solved. By improving the traditional simulation method, we hope to find a more efficient and better convergence of the steady-state calculation method.

2. THEORETICAL METHOD OF STEADY-STATE CALCULATION AND ANALYSIS OF PIPE NETWORK

2.1 Newton Raphson steady state calculation method

First, according to Kirchhoff's first law, the algebraic sum of flow in any node is zero, and the matrix equation of node equations of gas pipeline network can be obtained:

$$L - A_1 Q$$

In this consensus, N_1 dimension, represented by L , represents the load vector on the load node; A_1 represents the reduced branch node correlation matrix; and Q represents the flow vector in the branch pipe, representing the B dimension.

Secondly, Jacobian matrix can be obtained directly. Matrix J is a node Jacobian matrix:

$$J_{ij} = \frac{\partial f_i}{\partial f_j}$$

Thirdly, the equations are solved. If the pressure is very close to the real value, the value of the difference f (PT) will be infinitely close to 0. Newton node method needs to use iterative method to solve the formula until the difference of nodes is lower than the specified difference.

The most obvious disadvantage of the node method is that the convergence is not very good. Because in the equation, the node Jacobian matrix J contains the square root value and the items which are very close to the square root value, the calculation efficiency of these terms is relatively low. Moreover, this calculation method is sensitive to the initial value. Therefore, if the result obtained in the process of estimating the initial value of the iterative process is far away from the equation, the final calculation result is more likely to diverge.

2.2 Hardy Claus steady state calculation method

In this way, compared with Newton Raphson method, the former solves each equation one by one while the latter takes the equations as a whole to complete the solution. The initial approximate node pressure is given, and each node of the approximate value is modified alternately to obtain the optimal approximate value. Repeat the above process until the difference value of all nodes is lower than the specified allowable error value. For any node i contained in it, the node difference can be given by the following formula.

$$fi(P1) = \sum_{j=1}^b a_{1j} \varphi^j - A^T P - Li$$

In a single iteration process, considering the problems of different node sequences, a better approximate pressure value can be obtained by independent calculation. In addition, the corrected value of node pressure can be obtained by the flow in the branch pipe of node pressure. In the whole iteration process, the flow rate inside the branch pipe remains unchanged while the node pressure is corrected in order. In this calculation method, other relevant elements except diagonal in Jacobian matrix are ignored, so the convergence of this method is worse than that of multi violation.

2.3 The steady-state calculation method of Newton's loop

To solve the equation by Hardy Claus steady-state calculation method, it is necessary to determine the initial approximate value of loop flow Q and branch pipe flow Q , modify the approximate value of each node alternately to obtain the optimal approximate value, and repeat the above calculation process. Until all the calculated nodes are lower

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than the specified value. For each loop J, the specific data of loop difference are as follows:

$$fj(q) = \sum_{i=1}^b bji \varphi Q_0 + B^T Q$$

In a single iteration process, the specific order of loops must be considered. In the practical application process, if the approximate value of all loops is good, the calculation can be completed independently. With the help of branch pipe flow calculated by loop flow, the correction value of loop flow is calculated. In all iterations, even in the process of correcting the loop flow in turn, the branch flow remains unchanged as a whole. In the specific iteration, after the flow of each single loop is corrected, the branch flow needs to be recalculated to help reduce the number of iterations.

2.4 Steady state calculation method of linear approximation

The linear approximation steady-state calculation method is used to calculate the equations and nonlinear equations. There are two specific ways: the first is to solve the loop method; the second is to solve the node pressure difference. Because the second method can complete the calculation without providing the initial flow value of the pipe section, this method is also simpler. According to the method of nodal linear equations, the pressure value of pipe section is solved:

$$Y\Delta P = q$$

Y in the formula represents the nodal admittance matrix. According to the relationship between node pressure and pressure drop in the branch pipe, the pressure drop column vector p value can be obtained.

3. CALCULATION AND ANALYSIS OF STEADY-STATE EMPIRICAL SCORES OF LONG-DISTANCE NATURAL GAS PIPELINE NETWORK

3.1 Establish equations

The establishment of the equations should be based on the natural gas flow in the pipeline, that is, the flow meets the basic equations of energy conservation, momentum and mass conservation law, and thermodynamics law. The mathematical model of pipe section flow and node pressure can be described by the following equations:

$$\begin{aligned} S \frac{\partial p}{\partial t} + \frac{\partial M}{\partial x} &= 0 \\ \frac{\partial M}{\partial x} + \frac{\partial(\frac{\partial M^2}{\partial x} + SP)}{\partial x} + \frac{\lambda M|M|}{2pDS} + Spg \frac{dh}{dx} &= 0 \\ \frac{P}{p} &= ZRT \end{aligned}$$

In the formula, M is the mass flow rate of natural gas, and M is the unit height of the pipeline; m is the mass constant of natural gas; m is the unit of gravity flow; m is the unit of gravity flow; m is the unit of mass flow of the pipeline. Assuming that the gas flow in the pipeline is relatively stable, the influence of time variable can not be considered. When solving the above differential equations, the obtained equations contain the content of steady-state flow in elevation. Considering the inconsistency between the actual situation of gas flow in the pipeline and the reference direction, a more directional steady-state flow equation should be used in the steady-state calculation model.

$$M = q(P1, P2)$$

According to the first law of Kirchhoff, we can directly get the flow balance equation of load nodes in the pipe network:

$$Li = \sum_{j=1}^J aij Mj$$

$$j = 1, 2, \dots, J$$

Where AIJ = + 1 represents the value when the pipeline enters node i; when AIJ = - 1, it represents the value when the pipeline leaves node i; when AIJ = 0, the value of pipeline J and node i are not connected. If the load value is positive, it means that the gas is transported to the pipe network; if the load value is negative, it means that the pipe network supplies gas to the outside; when the value is zero, it means that the immature gas is not supplied. J represents the total number of pipe network runs. With the help of Newton iteration method, the load node pressure is obtained. According to the formula, the flow rate of different pipe sections is calculated, and the reference node load is obtained.

3.2 Establish the initial pressure distribution model

Most of the natural gas flowing in the pipeline belongs to the resistance square area, so the friction loss in the pipeline can be expressed by the following formula:

$$\Delta Fj = KjMj^2$$

$$kj = \frac{\lambda ZRTL}{F^2 D}$$

In the formula, the friction loss is expressed in PA; the pipeline constant is expressed in kJ; the pipeline cross-sectional area is expressed in M2, which is expressed by ki pipeline constant. According to this characteristic, the objective function is determined as the comprehensive minimum value of friction loss of different pipe sections in the pipe network; each load node in the pipe network needs to follow the first theorem of Kirchhoff, which is also an important constraint condition. In addition, it is necessary to combine the reference node pressure and steady-state flow equation to obtain the pressure distribution mathematical model.

3.3 Newton iteration method to calculate steady state equations of pipe network

In the calculation of nonlinear equations, Newton iterative method is commonly used. Compared with other methods, the convergence speed of this method is faster, but the requirements for initial value are also higher. The accuracy of the initial value directly affects the final convergence rate.

Firstly, the initial pressure distribution model should be used to allocate the initial pressure of load nodes.

Second, let $f_i(P1, P2, PN)$ = get the calculated function value.

Thirdly, calculate Jacobian determinant

Fourth, further calculation.

Fifthly, the relationship between the calculated value and the fixed value is judged by combining the calculated value obtained in the fourth step. If the value obtained is lower than the given value, the calculation can be terminated directly. Otherwise, it is necessary to calculate again from the second step.

3.4 Analysis of calculation examples

Select 10 nodes of natural gas pipeline in a certain area, and obtain the basic information of node data first. As shown in Table 1:

Table 1 10 nodes of natural gas pipeline

Node serial number	Load value(Nm ³ /d)	pressure(MPa)	altitude(m)
1	-	4.40	1320.6
2	0	-	
3	-33702	-	
4	0	-	1195.3
5	0	-	975.6
6	-16352	-	940.6
7	-21350	-	1053.50
8	0	-	1054.31
9	-60012	-	376.9
10	-	3.02	355.61

Table 2 shows the calculation results of natural gas pipe network pressure value. The initial value of load flow estimation method pressure and the initial value of wear minimum method pressure of 10 nodes should be counted, Table 2 calculation results of pressure value(MPa)

Node serial number	Initial value of pressure	Initial results of wear minimum pressure	Calculation results	Measured value	Error of calculation and measurement(%)
1	4.40	4.40	4.40	4.40	0.0
2	4.18	4.18	4.17	4.19	0.5
3	4.01	4.02	4.02	4.04	0.6
4	3.68	3.76	3.77	3.71	1.0
5	3.47	3.52	3.52	3.55	0.6
6	3.20	3.22	3.23	3.26	0.6
7	2.94	3.09	3.12	3.12	0.5
8	2.86	3.06	3.08	3.11	0.6
9	2.85	3.03	3.05	3.06	0.5
10	2.83	3.06	3.06	3.06	0.0

and the error between the calculation result and the actual test pressure value, the calculation result and the measured value should be counted.

According to the values in Table 2, we can find that the error between the calculation value obtained by this model and the actual measurement result is relatively small, and the error is within 2%, indicating that the engineering meets the accuracy requirements.

4. DISCUSSION

Natural gas is more and more widely used in the market because of its advantages such as high efficiency, clean, full combustion and less pollution to the environment. At present, natural gas is mainly used in power generation, residential, chemical and automotive fuels. In the 21st century, the natural gas industry will also usher in good development opportunities. It is also very important to study the natural gas transmission and distribution network system. At this stage, the gas transmission and distribution network has become a very important part of the whole natural gas storage and transportation system. Compared with a single gas pipeline, the advantages of the gas transmission and distribution network system are more obvious, such as: promoting the reliability of gas supply; developing a wider range of natural gas market; increasing the social and economic benefits of the natural gas industry; making full use of the capacity of the gas transmission pipeline; and improving the flexibility of gas transmission scheduling. With the use of natural gas more and more widely, more countries began to build pipe network. In today's world, the most intensive and developed area of gas transmission pipeline network construction is in Europe.

China's pipeline network construction time is relatively late, and there is no relatively perfect network system in the whole country [3]. Most of them belong to regional pipeline network, and natural gas resources are not fully utilized. In order to meet the increasing demand for natural gas resources in China, it is necessary to consider not only the specific needs of domestic natural gas pipeline network construction, but also the development trend of international natural gas pipeline network, so as to realize the scientific allocation of foreign and domestic natural gas resources.

In the process of natural gas going to the market, the most critical link is the natural gas pipeline network, which is also an important bridge for communication between users and gas sources, and a key way to promote the level of natural gas utilization [4]. Therefore, it is very important to optimize the natural gas pipeline network and improve its reliability. With the continuous improvement of natural gas utilization level, the complexity of pipeline network is also increasing. The complexity is embodied in the following aspects: the number of branches and loops in the pipe network; the increase of gas source pressure; the diversification of pipe diameter; the longer the transmission distance and the increase of the flow rate of the pipe network. The emergence of these characteristics has also brought a series of problems affecting the safe operation of the pipeline network. In order to enhance the safety and reliability of the natural gas pipeline network, it

is generally necessary to solve the problem from two aspects: first, optimize the hardware equipment, such as the introduction of SDACA system, which can promote the improvement of the automation level of the pipeline network and enhance the ability of resource allocation of the pipeline network in the face of emergencies. The disadvantage of this method is that it can not promote the automation degree of the pipeline network, nor can it improve the network automation. Therefore, it can not play a greater role in the maintenance of the pipe network system. Second, optimize the software system. With the help of the relevant theoretical basis of natural gas pipeline network, this paper analyzes the operation status of the pipeline network, so as to make up for the shortcomings of the hardware system. In the process of analyzing natural gas pipeline network, the calculation and prediction of natural gas pipeline network stability and load are very important contents. We can understand the demand development trend and flow law of natural gas, and carry out more reasonable scheduling, production and maintenance of natural gas.

The theory of stability and dynamic calculation of natural gas pipeline network was first put forward in Europe and the United States. Combined with different pipeline network characteristics, more than ten calculation methods related to pipeline network were summarized [5]. Due to the great difference of gas transmission network in different countries, there is no uniform steady-state calculation method suitable for different regions. The steady-state calculation of natural gas pipeline network system refers to the calculation of different node pressure and pipe section flow with the help of steady-state mathematical model of network elements and energy

conservation law when the flow of natural gas in the pipeline network is relatively stable.

In this study, we first introduce different steady-state calculation methods, and then find a more suitable method to carry out empirical analysis. In the empirical analysis, the specific data model is constructed first, and then the Newton iteration method is used to calculate the steady state of natural gas pipeline network. The results show that the numerical errors calculated by this method are less than 2%, which proves the effectiveness of this method.

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On the Innovation of Sports Culture Communication Strategy in The New Media Era

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Abstract: With the progress of science and technology, new media have appeared in our life. With the promotion of social economy, new media is developing and growing, and Internet technology is gradually affecting people's lives. The advent of the new media era has also played an important role in the spread of sports culture in China. Therefore, the content and channel of sports culture communication is very important. It is necessary to analyze the sports culture communication in the new media era represented by the current digital technology. This paper explores this problem, summarizes the advantages of its new media and the ways to improve the communication status.

Key words: New media; Innovation; Communication strategy; Sports culture

1. NEW MEDIA ERA AND SPORTS CULTURE COMMUNICATION

1.1 New media

With the continuous improvement of Internet technology, new media based on digital technology began to appear in people's cognition. New media is a new term, which is a relative concept. At present, the definition of new media is still controversial in the news communication industry and academic circles. In our daily life, people call the way of communication in the Internet as new media, and the era influenced by new media is called the new media era. People have a certain understanding of new media. With the rapid development of high-tech, new media and traditional media are competing and merging with each other. There are still some differences between new media and traditional media [1-3]. Compared with the traditional media, the new media has broken the traditional media's monopoly on information, and there is no time limit in the new media. Its open and unrestricted expression has imperceptibly changed the way of human life, and also eliminated the boundaries between traditional media and the estrangement between different circles. So that all industries can more mutual understanding and integration, so it can also bring a more convenient form of sports culture dissemination.

New media also brings a variety of services and independent choices for the audience. They can choose the industry or news they need to know according to their personal preferences. Compared with traditional media, new media can spread more quickly and effectively. People can watch real-time through mobile phones and computers. It is no longer limited to indoor TV, and information reception is more convenient and fast Sports culture communication also uses new media, the overall development of quality education has been recognized by

people, weight sports culture is more important, through the all-round dissemination of new media, let people know more about sports knowledge.

1.2 The change of sports culture communication in the new media era

Super strong media can make people understand new content more quickly, but it can also reduce the cost of new content. The new media era not only promotes the development of social science and technology, but also makes people's thoughts keep pace with the times and get relative progress and promotion. With the advent of the new media era, the media industry has also ushered in a major reform, and sports culture has been affected in the process of communication.

1.3 Interactive two-way communication of new media deepens the depth of Sports Culture Communication

Compared with the traditional media, new media has more interactivity, and the dissemination of sports culture has changed from one-way communication to two-way communication. Although the content of sports culture has not changed in a large area, this boundless way of communication also makes sports culture have certain changes. New media also provides a new platform for people to discuss with each other. With the advent of new media, more sports fans are no longer limited to one-way communication, they can learn the current sports news through real-time information on mobile phones and computers.

1.4 High integration and resource sharing of traditional media and new media

The transformation of the media industry makes the traditional media and new media carry on the corresponding integration and adaptation, then the sports culture dissemination is also making the corresponding adjustment according to the form of the media industry. With the development of digital network technology and the development of cultural trend, the boundaries of traditional media are gradually blurred, and the audience of the media has changed from one-way listening to information to tailor-made information. It also makes the dissemination of sports culture get better promotion and interaction [2].

1.5 Compared with the traditional media, it reflects the diversified advantages of we media

Since the formation of media form, the official account has been gradually formed in the rapid development of new media. It also makes the diversification of sports culture spread in the new media era. Since the media is everyone can become a communicator, everyone is a news source. The traditional media are broadcast after reporters. And from the media platform, individuals can be sent through

various forms of micro-blog or public address. Cloth, such as the main body of communication is diversified, sports culture can also be spread through the form of we media, so as to improve the intensity and effect of communication.

2. THE STRATEGY OF SPORTS CULTURE COMMUNICATION IN THE NEW MEDIA ERA

In the development of human civilization, sports culture has brought health and vitality to human beings, and sports culture plays a very important role in qualified talents of socialist modernization. Sports culture not only regulates people's sports health behavior, but also affects personal values. Therefore, with the development of new media, sports culture communication should also find new ways to get more people's love and watching.

2.1 Strengthen the construction of new media communication subject and improve the ability of active communication

The dissemination of sports culture should also comply with the changes of the times, carry out diversified ways of communication, and actively improve the ways and means of communication. In this era, the main body of communication determines the content and mode of sports culture communication. We should combine the reality, give full play to the folk power, give full play to the role of new media in the Internet. The development of new media to sports participation also affects the change of sports culture. We should promote the spread of sports culture, improve the awareness and ability of active communication, and integrate sports culture into the spiritual world of the masses.

2.2 In order to improve the communication efficiency and effect, we should pay attention to the new media communication path

Under the successful establishment of sports culture communication subject, we should make corresponding changes to the traditional communication path. At present, we media platform is favored by more audiences because it is not limited by time and place. With the development and progress of science and technology, the emerging convenient media is also an important trend of sports culture communication in the future. Some important sports competitions can achieve omni-directional and three-dimensional sports culture communication by combining the advantages of new media and traditional media Let the public understand sports information more deeply. To strengthen the construction of communication path of new media is to let people understand sports culture subjectively and actively. Therefore, the perfect combination of new media and traditional media is needed

to improve the communication efficiency and effect.

3. PAY ATTENTION TO THE CONSTRUCTION OF COMMUNICATION CONTENT AND IMPROVE THE QUALITY OF SPORTS CULTURE COMMUNICATION

The content of communication is the core of cultural communication, and the quality of content determines the quality and effect of communication. With the continuous progress of China's sports, the state has gradually attached importance to the development of sports, and the publicity of sports culture has increased, which has enhanced the understanding and cognition of the masses to sports culture. With the increase of publicity, we should pay more attention to the content of culture. Sports culture can be spread around important sports competitions or international competitions such as the Olympics. We should also strengthen the publicity of sports knowledge or sports policies understood by the masses, so that the masses can truly understand the importance of sports, so as to improve the quality of sports culture communication.

4. CONCLUSION

In today's fast-paced urban life, sports culture should be popularized in an all-round way to cultivate healthy and upward sports values of the masses. In the era of new media, the new form, new culture and new value of sports culture have been excavated. This culture is widely accepted by the public under the status of new media, which makes people's understanding of sports culture more and more profound. The spread of new media in a wide range and from different angles enables people to have a more in-depth understanding of sports, the importance of sports to the public and to the country, which can accelerate the pace of China's entering into a sports power. The dissemination of sports culture is particularly important in the new media era.

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Discussion on The Problems and Direction of Computer Network Information Retrieval

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Abstract: With the advent of the Internet era, the computer network can be said to penetrate into the lives of the vast majority of people, and in our daily life, information retrieval function application is even more essential. From people's feedback, the accuracy of information retrieval still needs to be greatly improved. This paper focuses on the analysis of the problems existing in the accuracy of retrieval and the improvement methods, hoping to provide some effective suggestions to solve this problem and further improve the system.

Key words: Computer network; Information retrieval; Accuracy

1. INTRODUCTION

Information retrieval has gradually replaced the traditional way of information retrieval on the Internet, which has also changed people's life. Without the previous time-consuming and labor-consuming, the scope of information collection has been greatly improved. However, under the condition of more comprehensive information, the accuracy problem has become another difficult problem that puzzles the network information retrieval. In order to overcome this problem, we must first find out the factors causing these problems, and then improve the accuracy of information retrieval through further optimization.

2. PROBLEMS IN THE ACCURACY OF NETWORK INFORMATION RETRIEVAL

2.1 Inaccurate positioning of search title content

According to the survey, many people have had similar problems in the search process, because the search Title input is not professional enough, resulting in the search process only part of the text in the title is retrieved. The Internet under the operation of big data uses solid-state thinking to solve the problems provided by users. Due to the incompleteness of the database, only some words or representative statements can be extracted from the title for retrieval. After inputting the title content that you want to search, it will automatically extract words or common search content, and only search and check this. A single noun explanation is not the answer you want to search, resulting in a large deviation between the final content and the expected results, resulting in poor experience. Gradually reduce people's trust in Internet search [1].

2.2 The search content is not comprehensive

It is necessary to collect enough information in the background of the search engine to ensure that the amount of information collected by the search engine is sufficient. In the process of search, there are often few reference cases of search content, and sometimes the search questions will show no answer, or other questions appear to let users modify the search content. This not only requires more

market research and more case collection, but also needs to check, classify and screen the collected information, which will greatly affect the smooth operation of search engines. This can be said to lead to the current information retrieval accuracy is not perfect the biggest problem.

2.3 The accuracy of the new search method is too low

Although many search engines have launched other search methods in addition to text search, the technology is not mature enough to meet people's search needs in a short time. For example, now the application of image search is still more extensive, when the image upload results often form a huge deviation with the real object [2]. When the photo search was just launched, because of its low accuracy, it once made a variety of laughingstock, because of the immature technology, all kinds of plant identification into animals, the identification of all kinds of objects confusion problems emerge one after another. Compared with the past, this problem has been greatly improved, but there is still a long way to go from perfect, so his accuracy still needs to be greatly improved.

2.4 Too many messy ads in search interface

In many professional search engine interface, whether you just opened or in the process of browsing the search results, there will always be a lot of inexplicable pop-up ads, disturbing the reader's reading thoughts. Because of the inaccuracy of search results, users will be more complex in the search results, and the emergence of irrelevant advertisements will make users feel irritable, and even reduce the user's experience when they can't meet their search needs. Some search results have the current popular term "headline party", which uses language to attract users in the content introduction before clicking in, but after opening, there are only stereotyped nonsense and sales promotion of some products. This kind of problem is also that the background of the network search engine does not accurately locate the information collected, and does not have a detailed understanding of the content in it, just to perfunctorily expand the so-called information base, and upload such worthless search results for reference [3].

3. HOW TO IMPROVE THE EXISTING PROBLEMS OF NETWORK INFORMATION RETRIEVAL

3.1 Expand and standardize information database

Only when the reserve in the database is comprehensive enough, a series of related case events or answers can be provided when users search questions. Fully do market research, try to be meticulous, research different types of people in different areas and industries, and study whether there are multiple search methods for the same problem. It is no longer to extract part of the text or words in the search title. When the content of the database is comprehensive enough, we can find the answer which is highly consistent

with the content of the query title in time. For the search interface pop-up of all kinds of irrelevant advertising should be strictly prohibited, can be appropriate according to the needs of users to recommend some help to the formal software, not all kinds of advertising links emerge in endlessly, even some automatically download, to maximize the user experience.

3.2 Intelligent retrieval

The collected information is classified, summarized and sorted out in an intelligent way to avoid some useless content appearing in the user's search results [4]. After accurate content classification, according to the user's search needs, clear the purpose of the search title, accurately understand and expand, and finally present the most accurate and effective information to users. Moreover, it can also strengthen the memory system of search engines, memorize and organize the search contents of each user, analyze what aspects of the user's demand for search problems tend to be, and accurately locate the users, so as to provide more information required by users more efficiently.

3.3 Diversification of search methods

The progress of the times makes everyone seek diversification in various forms, and the Internet industry at the forefront of the times is no exception. Ordinary text search should also be derived from more diversified search methods, the development of multimedia era should also drive text search is no longer a single traditional way, but to let voice, pictures, video and other methods emerge as the times require. Under the diversified operation of search methods, accuracy is an essential prerequisite. For new search methods, it is necessary to carefully screen them. For example, for the identification of plant images, it is necessary to collect a large number of pictures of the same plant in different forms to improve the accuracy of search, For speech recognition, it is necessary to collect speech samples of different ages in different regions, especially in regional dialects, so as to improve the accuracy of various retrieval methods to the greatest extent.

4.CONCLUSION

In this paper, the computer network information retrieval in the content and function of the problems put forward some suggestions for revision. The progress of intelligence also drives the progress of the times. With the development of the Internet era, the network information retrieval will eventually replace the traditional manual information retrieval. Therefore, only by finding the problems in the network information retrieval as soon as possible, modifying and improving it as soon as possible, and improving its accuracy can be more comprehensively integrated into the present life, reducing the difficulty of searching and owning Better accuracy has brought greater convenience to people's life.

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Application of Green Building Design in Urban and Rural Planning and Construction

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Abstract: With the development of economy and the rapid development of science and technology, the society is constantly progressing, the pace of times change is speeding up, so the process of urbanization development in China is also improved. The rapid development of the times brings not only the improvement of people's living standards and quality, but also the damage to the environment and the impact on health. In this context, China, like other countries in the world, has gradually adjusted the national development plan, and the concept of environmental protection and green construction has been paid more and more attention. This paper mainly from the perspective of urban and rural planning and construction, discusses the practical application of green building design, in order to promote the national ecological development plan and ensure the healthy life of urban and rural residents. **Key words:** Green building design; Urban and rural planning and construction; Application

1. INTRODUCTION

Green building design pays attention to green, ecological, environmental protection and health, which is very important for the current urban-rural development, and the rapid development of urbanization has caused a great burden on the current environment. Green building design can promote the improvement of these shortcomings, promote the harmonious coexistence of architecture and nature and the harmonious unity of man and nature. The following will be based on green building design research, explore the ecological development of urban and rural planning and construction.

2. ANALYSIS OF URBAN AND RURAL PLANNING AND CONSTRUCTION UNDER THE CONCEPT OF GREEN BUILDING DESIGN

2.1 Starting from the basis of local environment

Green building design itself advocates catering to the natural environment, and carries out design, research and development and construction on the basis of not violating the natural law and environmental protection concept. Therefore, from this point of view, the green building design in urban and rural planning and construction should start from the local environmental foundation and make effective decisions according to the local environmental characteristics, otherwise the architectural design will violate the natural ecological law. In this case, it will not only damage the ecological environment, but also affect the healthy life of urban and rural residents. Generally speaking, the scope of urban and rural planning and construction is relatively wide. The combination of green building design and local natural environment can effectively promote environmental protection, promote the

further development of urban-rural integration, and provide impetus for social development and national progress [1].

2.2 Using green environmental protection materials

In the process of urban and rural planning and construction, some developers or construction companies will choose low-quality materials in order to reduce the cost, which not only affects the quality of the building itself, but also greatly endangers the stability of the local ecological environment. The long-term emission of toxic substances will directly affect the health of the surrounding residents. The selection of materials is the basic guarantee of the project building. To ensure a good green building design, the materials used need to be environmental protection, and can not cause uncontrollable social contradictions for temporary economic savings, so as to ensure the effectiveness of green building design.

2.3 Create a harmonious development atmosphere of urban and rural integration

Under the background of the development of the new era, the pace of life of modern people is fast, and the pressure of life is great. The improvement of living environment can alleviate people's mental tension to a certain extent, which means that urban and rural planning and construction under the concept of green building design can help to create a good living atmosphere. Therefore, in the process of urban and rural planning and construction, green building design should pay attention to the development differences between urban and rural residents to ensure that people's life, production and planning and construction maintain a harmonious unity, so as to ensure the efficient promotion of urbanization development process.

3. ANALYSIS ON THE APPLICATION OF GREEN BUILDING DESIGN IN CURRENT URBAN AND RURAL PLANNING AND CONSTRUCTION

Although the current economic growth is rapid, science and technology research and development is very fast, but there are still some problems in the application of green building design in urban and rural planning and construction

3.1 There are some deficiencies in urban and rural planning and pre construction design, mainly due to the lack of comprehensive and solid green building design theory. Many designers do not carry out detailed site exploration and investigation on the real environment, and focus too much on the architectural design itself, resulting in the lack of ecological aesthetic concept;

3.2 The application of green building design in the process of urban planning and construction has surface phenomenon. As the saying goes, theory is combined with practice. However, many design reviewers do not

comprehensively investigate the specific situation in the process of practice, as well as the applicability and green environmental protection of the building itself. Almost all their efforts are focused on the building structure and design, resulting in green building design on paper. It has not been combined with urban and rural development;

3.3 At the present stage, the practical application of green building design in urban and rural planning and construction lacks the combination of modern high-tech. no matter from the design stage or from the perspective of urban and rural development, there is a lack of application of advanced science and technology, such as intelligent technology. For the consideration of economic cost control, most designers and construction parties choose to carry out it manually, but this is not the case. In terms of green building design, it does not mean that it will save material costs and improve resource utilization, and it is difficult to achieve the goal of skilled environmental protection;

3.4 In urban and rural planning and construction, green building design lacks the supervision and control of government departments. After most of the documents of urban and rural development planning and construction are issued, the government departments relax the management, and the whole is supervised by the construction party or designer, which to a certain extent affects the real role of green building design. At the same time, the staff of government regulatory departments lack of green environment. Under the influence of factoring concept, the mastery of professional skills is not sufficient, and the final results are not fully integrated with green building design concept [2].

4. APPLICATION OF GREEN BUILDING DESIGN IN URBAN AND RURAL PLANNING AND CONSTRUCTION

The following suggestions are put forward to promote the development of green building in urban and rural areas through the analysis of current urban and rural construction and green building design:

4.1 Actively combine the concept and mode of green building with urban and rural development plan and integrate it into the future construction decision-making, so as to guarantee the low-carbon, environmental protection, green and sustainable development of urban and rural planning and construction from the theoretical level, so as to ensure the coordination between the construction plan and the natural environment;

4.2 To improve the constraints of urban and rural planning and construction development, relevant national departments or government agencies put forward new

policies or conditions for urban and rural planning and construction and green building design, resolutely innovate the contents that are not conducive to the development of green buildings and environmental protection concepts, and put forward new requirements to strengthen the application of green environmental protection concepts in design and planning, so as to protect the environment in urban and rural development. The stability and resource saving of the system;

4.3 It is necessary to further improve and innovate the theory and method of green building design to realize the unification of economy, environmental protection and sustainable development of urban and rural planning and construction, so as to ensure the effective application and future value of green building design in the constantly developing urban and rural planning. At the same time, practitioners should pay attention to actively absorb the experience and lessons of successful cases, and find their own shortcomings to promote the improvement of the work and the progress of the country.

5. CONCLUSION

In a word, with the rapid growth of national social economy and the rapid development of economic construction, urban and rural planning and construction gradually ushered in new opportunities, but green building design is the conceptual guidance of urban and rural development. Respecting the concept of green development and applying the idea of green building, on the one hand, is the key to ensure the urban and rural planning and construction, on the other hand, it is an important part of realizing the scientific development of urbanization and the concept of sustainable social development. In the future development process of our country, green building design should be actively applied to all fields of society to ensure the stability of ecological environment and people's health, so as to provide sustainable power and support for national development.

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Problems and Countermeasures of Electric Power Logistics Management in Colleges and Universities

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Abstract: With the continuous improvement of modern science and technology, in order to meet the teaching and living needs of teachers and students, a large number of modern power equipment and facilities are applied in Colleges and universities. However, due to the traditional logistics management in some colleges and universities and the low awareness of power saving, it is easy to cause a large amount of power energy waste, and even cause some safety accidents. Therefore, university administrators need to strengthen the importance of power management, and with the help of the application of modern energy-saving equipment, concepts and methods, improve the level of power logistics management, create a more healthy and safe learning and living environment for all teachers and students, and then promote the healthy development of colleges and universities. The following mainly analyzes and explores the problems and Countermeasures of power logistics management in modern colleges and universities. **Key words:** College electric power; Logistics management problems; Solutions

1. THE CURRENT SITUATION OF ELECTRICITY CONSUMPTION IN COLLEGES AND UNIVERSITIES

In general, in the process of modern university power consumption, it can be divided into official power consumption, college and department power consumption and student power consumption. Among them, most of the official power consumption in Colleges and universities is in the state of free use, coupled with the imperfect power saving measures, it is easy to cause the phenomenon of power waste; the power consumption of colleges and departments mainly refers to the daily teaching and office work of colleges and departments. And the electric energy used in the process of scientific research, among which there is a certain quota management in the use of television in scientific research, while the process of daily teaching and department office work is still in the state of free use, which will also cause the phenomenon of waste of electric energy; while the power consumption of students mainly refers to the power consumption in their daily life, due to their daily lighting and the use of electrical appliances and other processes. For this reason, relevant colleges and universities will carry out quota management and cultivate students' awareness of saving electricity[1].

2. COMMON PROBLEMS OF POWER MANAGEMENT IN MODERN COLLEGES AND UNIVERSITIES

2.1 Lack of awareness of saving electricity

Through the investigation of a large number of university logistics management work, it is found that a considerable number of management personnel are more traditional in their own ideas and lack of awareness of saving electricity, which leads to the phenomenon of public or free power consumption in the school, which causes increased waste and consumption of electric energy resources, and affects the improvement of overall economic benefits of colleges and universities.

2.2 Lack of perfect electricity management system

At the same time, due to the scientific and standardized management system to a large extent to avoid the occurrence of waste of electricity, so as to ensure the level of internal power management in Colleges and universities; however, due to the influence of traditional concepts and other factors, the internal logistics management department of colleges and universities lacks sufficient professional level, and there are great defects in the power management system and supervision mechanism. Problems can not be found and handled in time, which leads to the emergence of electricity safety accidents; in addition, some teachers and students lack the awareness of saving electricity, which further affects the normal operation of power management.

2.3 The application level of power energy-saving products is low

In addition, in the process of modern power management, the application of energy-saving products can effectively avoid the waste of electric energy resources. In the process of logistics management in some colleges and universities, due to the lack of sufficient understanding and attention to energy-saving products, they did not invest more capital costs for them, and when the daily operation of colleges and universities, they still use the traditional old electrical equipment and facilities. The low level of daily maintenance leads to the low quality and service life of the equipment itself. In addition, the equipment not only consumes a lot of electric energy, but also has certain security risks, which affects the operation and development of colleges and universities.

3. SPECIFIC MEASURES TO STRENGTHEN THE POWER MANAGEMENT IN COLLEGES AND UNIVERSITIES

3.1 Strengthen the publicity and education of power saving

At present, in order to strengthen the development of power logistics management in modern colleges and universities, the relevant university managers need to change the traditional working concepts and methods,

strengthen and improve their awareness of saving electricity. On this basis, they should strengthen the publicity and education work, and publicize the importance of power saving to all teachers and students with the help of Student Union and various associations. The establishment of the concept of saving electricity and standardizing the use of electricity provides convenience for the healthy development of colleges and universities.

3.2 Strengthen the use of scientific power management mode

Generally, scientific and standardized power management can guarantee the level of power logistics management to a large extent. Therefore, in modern colleges and universities, managers need to actively participate in training and education, improve their professional quality, skill level and consciousness of saving electricity. At the same time, university leaders also need to invest enough capital cost to introduce modern electricity. At the same time, the relevant personnel also need to regularly maintain the power equipment and facilities, and with the help of modern equipment for real-time monitoring, to ensure that when a certain power equipment failure can be found and handled in time, to provide guarantee for the normal operation of the internal power system in Colleges and universities, and promote the power consumption in Colleges and universities. The healthy development of management.

3.3 Strengthen the innovation of power management system

At the same time, in order to guarantee the management level and quality, the leaders of colleges and universities need to conduct a detailed and in-depth investigation and understanding of the power management work, clarify the defects and deficiencies of the traditional power management work, and according to the policy provisions of the relevant departments, combined with the power demand of colleges and universities, in order to create a more new and effective management. At the same time, the relevant colleges and universities can establish more professional power management center, further standardize the steps and processes of internal power management in Colleges and universities, avoid the occurrence of work errors and other problems, so as to promote the healthy and stable operation and development of colleges and universities.

3.4 Strengthen the application of power saving equipment

When colleges and universities carry out electricity management work, managers can also strengthen the application of modern energy-saving equipment, such as energy-saving lamps, voice controlled lights, solar power supply and water heaters, etc. when managing the dormitory electricity, the relevant personnel can also use

the intelligent centralized control electricity meter to avoid excessive power consumption, improve the awareness of teachers and students to save electricity, and create a more healthy and safe Comprehensive electricity environment, at the same time for the healthy development of colleges and universities to provide adequate protection.

3.5 Strengthen energy saving design of building electrical system

In addition to the above measures, in the process of power logistics management in modern colleges and universities, in order to improve the level of power management, relevant personnel can carry out energy-saving design on the building electrical system, and can optimize the internal power network of colleges and universities with the help of the application of modern buildings, mechanical and electrical control systems, so as to reduce the overall power consumption of colleges and universities, and then promote the power of modern colleges and universities. Logistics management level to improve [3].

4. CONCLUSION

To sum up, with the passage of time, the concept of energy conservation and environmental protection has been in-depth implementation and application in all walks of life; and in the operation process of modern colleges and universities, due to the influence of traditional concepts and other factors, there are great defects in power logistics management, and at the same time, it will cause problems such as power waste and power accidents. Therefore, university managers need to follow the energy-saving environment. According to the policy requirements of the relevant departments, we should cultivate and improve our awareness of saving electricity. At the same time, we need to invest a lot of capital cost, strengthen the introduction of energy-saving equipment, ensure the normal operation of modern university power logistics management, and then promote the further development of the university itself and the whole society.

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Research on the Reform of Pharmaceutical Engineering Talents Training System Under the Background of New Engineering

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Abstract: Under the background of the rapid development of society, China pays more attention to the progress of teaching work. According to the actual situation of pharmaceutical engineering specialty and the requirements of the current new situation for excellent talents, we began to innovate and reform the personnel training work and practice teaching of pharmaceutical engineering specialty, so as to promote students to master various key theoretical knowledge and have good knowledge. The ability of engineering technology integrates theory and practice to meet the personalized needs of actual production, so that pharmaceutical engineering students have a broader development space after entering the society and improve their competitiveness. Therefore, this paper will focus on the reform of pharmaceutical engineering talent training system under the background of new engineering as the theme to carry out the analysis, through a detailed understanding of the value and advantages of the reform of pharmaceutical engineering talent training system under the background of new engineering, and then put forward the feasible countermeasures to promote the reform of pharmaceutical engineering professional talent training system.

Keywords: New engineering background; Pharmaceutical engineering specialty; Talent training system; Reform

1. RESEARCH ON THE REFORM OF TALENT TRAINING PROGRAM OF PHARMACEUTICAL ENGINEERING SPECIALTY UNDER THE BACKGROUND OF NEW ENGINEERING

Under the background of new engineering, pharmaceutical engineering personnel training should pay attention to learning from the experience of foreign colleges and universities, and optimize and improve the talent training program combined with their own actual situation. Therefore, colleges and universities in China should reflect their unique advantages in pharmacy, and treat the weak links of chemical engineering discipline with a correct perspective, so as to achieve the goal of always attaching importance to the construction and development of pharmaceutical engineering. For the main courses related to chemical engineering, colleges and universities are required to timely adjust the structure and proportion of the curriculum system and implement the integration of curriculum content. For the current curriculum system, there are pharmacy, chemistry, chemical engineering and technology disciplines. Compared with the initial stage of specialty setting, the proportion of current pharmaceutical

courses shows a decreasing trend, the proportion of engineering courses is gradually increasing, and the number of interdisciplinary courses is increasing. In the current new round of undergraduate professional talent training program revision, the course hours have been further adjusted. The compulsory courses have been reduced from 2700 class hours to 2200 class hours. At the same time, some course contents have been rationalized. However, the teaching content has not been greatly reduced, so as to realize the integrity and professionalism of the curriculum system. For example, the pharmaceutical chemistry course carried out in the revised pharmaceutical engineering specialty will integrate the related contents of the course of pharmaceutical synthetic chemistry and medical polymer materials. In addition, some courses have added some class hours. Therefore, by continuously optimizing various teaching contents, the teaching work will be carried out in an orderly manner, so that students can broaden their horizons and master more rich knowledge, so as to provide guarantee for promoting the reform of talent training system of Pharmaceutical Engineering Specialty under the background of new engineering [1].

2. RESEARCH ON THE PRACTICAL TEACHING MODULE OF PHARMACEUTICAL ENGINEERING UNDER THE BACKGROUND OF NEW ENGINEERING

The development of practice teaching focuses on students to form good experimental ability, master various experimental skills, apply the knowledge learned to practice, and have scientific thinking and innovative thinking. The experimental teaching module is mainly divided into simulation experiment, open experiment and basic experiment. The so-called basic experiment is to enable students to master the key basic knowledge in the learning process, and have the ability to process experimental data, enhance the awareness of integrating theory with practice, and let students have professional quality in the subtle process. The main purpose of open experiment is to let students design research experiments. As a teacher, teachers should give students specific experimental topics, and then students can implement independent design scheme and put it into practice according to the conditions provided by the laboratory and combined with the key contents of learning. Therefore, the practical teaching pays more attention to the embodiment of students' main body status, so that students can form a good ability to analyze and deal with problems. And the

simulation experiment requires teachers to give full play to the advantages of multimedia simulation technology, use multimedia simulation technology to simulate real experiments, improve the traditional experimental form, at the same time, the experiment that is not easy to do in the laboratory or with high difficulty coefficient can be completed by this means. And ensure that the whole experimental process is vivid and operable, so that students have a deep understanding of the actual workshop production of pharmaceutical enterprises, and lay a solid foundation for improving students' computer application ability and engineering practice ability [2].

In addition, teachers should also pay attention to carry out practical teaching for students. Practice teaching is mainly divided into cognitive practice stage, production practice stage and graduation practice stage. The three learning stages are connected with each other, and from simple to deep. Teachers should arrange students to carry out cognitive practice first. The internship period is two weeks, which can be arranged in freshmen or sophomores, so that students can master pharmaceutical enterprises and enterprise products in the form of social practice. The production practice period is long, usually one month, which can be arranged in senior year. Through the production practice, students can truly enter the production workshop, master the production process of the enterprise, understand the enterprise management system, implement the interconnection of quality awareness, industrial safety, pharmaceutical production and various laws, so as to improve the students' ability to deal with problems. The graduation practice is the content of the graduation project, which requires the school to give full play to the "production, learning and research" cooperative teaching mode, make use of the advantages, promote the effective integration of the professional and enterprise resources, provide internship places for students, and promote students to learn experience in enterprises and accept enterprise management. However, teachers require students to record their own practice process and complete graduation thesis [3].

3. TO EXPLORE THE TEACHING EFFECT OF PHARMACEUTICAL ENGINEERING TALENTS TRAINING UNDER THE BACKGROUND OF NEW ENGINEERING

In the current background of new engineering, the talent training of pharmaceutical engineering is gradually optimized and improved, and some teaching results are obtained, which meets the ideal teaching requirements. Therefore, the talent training program and practical teaching reform and innovation are the guarantee and foundation for improving the quality and efficiency of

running a school. It will enable students to change their learning attitude, master various theoretical knowledge and enhance their professional skills, integrate theoretical knowledge and practice, tap innovation potential, and promote them to become compound talents of pharmaceutical engineering technology. Teachers and administrators in Colleges and universities should also have a sense of innovation, so as to constantly optimize and update the talent training system of pharmaceutical engineering according to the requirements of the current society and the learning basis of students under the background of new engineering [4].

4. CONCLUSION

Through the analysis of the above problems, we are fully aware of the importance of paying attention to the reform and innovation of talent training system of pharmaceutical engineering under the background of new engineering. It is required that in the follow-up teaching work, teachers should have modern teaching ideas, based on improving students' comprehensive quality and professional ability, and strengthening students' innovation ability and practical ability as the key. In fact, the purpose of the so-called interdisciplinary and interdisciplinary talents of pharmaceutical engineering and its related fields is to make the students engaged in pharmaceutical engineering and other related fields actively develop into a new type of interdisciplinary talents. Therefore, in the follow-up teaching, teachers should reflect the students' dominant position, realize the comprehensive and coordinated development of students' knowledge, skills and comprehensive quality, so as to lay a solid foundation for the smooth development of pharmaceutical engineering talents training.

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Research on The Reform of Advertising Design Teaching in The New Media Era

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Abstract: With the development of social economy and science and technology, great changes have taken place in the development of various industries in our country, and the education reform is also constantly in-depth. In the current social development, most colleges and universities have studied the curriculum teaching reform in the new period, especially the teaching of advertising design. In the social development, the traditional media is no longer meeting the needs of people and the development of modern society. In the new media era, the society also puts forward higher requirements for advertising design teaching. Based on this requirement, in order to meet the requirements of social development and get better development of advertising design teaching in China, it is necessary to carry out a certain degree of reform in advertising design teaching, so as to guarantee Advertising design teaching keeps pace with the times. This article and the design of the new media is the teaching reform.

Key words: New media era; Advertising design teaching; Mode reform; Analysis and research

1. THE CHALLENGE OF ADVERTISING DESIGN TEACHING IN THE NEW MEDIA ERA

No matter in any stage of education, due to the influence of our previous education ideas, in the process of education, we always attach importance to theoretical teaching and ignore practical education, which is also the case in some vocational colleges. Although the theoretical teaching in advertising design teaching has a certain importance, the practical teaching method can help students deepen the concept and improve the knowledge of learning. Through the research on the actual advertising design teaching in our country, it is found that most colleges and universities do not pay attention to the common-sense system of the course in the advertising design teaching, which leads to the unreasonable setting of the curriculum. This unreasonable course will lead to the unreasonable teaching of advertising design, and it is difficult to cultivate high-tech advertising design talents. Secondly, in the development of China's modern society, companies do not only pay attention to the theoretical knowledge of students, but also pay more attention to the actual ability of students. However, the current education mode in China is difficult to improve the practical ability of students in advertising design teaching, so it will have a certain impact on students' employment. Students in the study of advertising design are through the guidance of teachers, so teachers have an important impact on students' learning ability of advertising design teaching. However, advertising design teachers in most colleges and universities in our country are learning liberal arts, so it is difficult to carry out in the

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digital operation, because teachers lack the knowledge of new media, students can not To meet the needs of the new media era.

2. ANALYZE THE TEACHING OF ADVERTISING DESIGN IN THE NEW MEDIA ERA

2.1 Strengthen interaction and communication

In the development of the current society, computer technology has been widely used, which makes the interaction of advertising fully reflected. From the actual situation, the most scientific, reasonable and efficient form of advertising communication is the interaction between communicators and consumers. After disseminating information, consumers only need to observe consciously and purposefully. They can obtain the information they need [1].

2.2 Integrate brand information

In the process of market development, different consumers' preferences, personalities and moods are different. These differences will lead to different needs of different consumers. Based on this situation, advertising should be adjusted from the characteristics of the product itself, and to meet different needs of consumers, so as to improve the market share of goods from the psychological satisfaction of consumers. Share.

2.3 Connection information service

In the past teaching of advertising design in China, static advertising design is generally used. This kind of design can only make the masses see the content displayed in the advertisement, making consumers in a passive position. In the current new media era, the development form of advertising has changed from static to dynamic, and the information carrier of advertising has also broken the original miscellaneous of newspapers and broadcasting. The form of media communication such as Zhi makes it convenient for consumers to receive information. Consumers can collect their information needs through the Internet. Therefore, the new media era also makes information service more efficient.

2.4 Even management information

In the new media era, advertising design teaching should change the traditional teaching concept. Only when we understand that advertising is not a static brand display and the existence of commodity information form, can we make advertising have better interactivity in the new media era, so that consumers can choose their own products according to their own needs. It can be seen that in the new media era, the supply of personalized information not only needs to integrate and disseminate different information, but also needs timely management and communication of information.

3. THE SPECIFIC REFORM OF ADVERTISING

DESIGN TEACHING IN THE NEW MEDIA ERA**3.1 Omni directional component practice mode to increase students' practice opportunities**

In the new media era, the reform of advertising design teaching should first of all change the teaching idea. In the teaching of advertising design, we need to pay more attention to practical teaching, and to improve the practical teaching of advertising design, advertising major should use its own advantages to construct cooperative relationship with relevant enterprises, so as to improve the students' opportunities for practical learning in advertising design teaching Practice can not only make students understand the difficulties of advertising creation during the internship, but also improve the students' team cooperation and interpersonal communication ability. Secondly, in the process of school enterprise cooperation, we can also establish characteristic training bases and develop training plans for students in line with the school, so as to enhance the integration of teaching inside and outside the school and improve the level of students' advertising design [2].

3.2 Increase teaching investment and establish high-quality teaching staff

In the teaching of advertising design, teachers are the guidance of students, so in order to reform the teaching mode of advertising design reasonably, it is necessary to improve the quality of teachers, which can not only enhance the students' learning initiative and enthusiasm, but also improve the teaching quality and effect of advertising design teaching course. In order to effectively improve the teaching staff, colleges and universities should increase the investment in funds and strengthen the cooperation and exchange between departments to achieve complementary advantages. Secondly, we can also recruit professionals engaged in advertising design to part-time teachers, through which we can enrich the experience of teachers, and effectively improve the construction of advertising design professional teachers.

3.3 Interactive teaching mode of components adapting to the teaching characteristics of advertising design in the

new media era

In the study of advertising design, students are in a passive position, but they can change their passive position into an active position. This requires teachers to actively encourage students to collect course materials and explore and learn knowledge through their own play. If students encounter difficult problems in the process of learning, they can overcome the difficulties of consulting relevant materials to understand In the process of teaching design, teachers should enrich the teaching content and let students use multimedia to practice design, so that students can improve their understanding of advertising design according to the design of different themes[3].

4.CONCLUSION

New media is an innovative way of media, which is based on the development of information technology and digital technology in the progress of social science and technology. The development of new media not only has greatly changed people's consumption habits and living habits. In this situation, in order to make the teaching of advertising design develop better, it is necessary to reform the teaching of advertising design in the progress of society. In the teaching of advertising design, in order to ensure the effectiveness of the reform, we should first change the previous education methods and concepts, and then improve the comprehensive quality of teachers, so as to seize the development opportunities in the new media era.

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Design and Analysis of Sample Gas Pretreatment System in CEMS System

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Abstract: The design of sample gas pretreatment system in CEMS system is related to the overall performance of the whole CEMS system. However, due to its "customized" characteristics according to the actual working conditions, it is difficult to summarize the key points, difficulties and key points of the design. Based on many years of experience in the design and development, product manufacturing, pre-sale and after-sales service of CEMS system in large and medium-sized thermal power plants and domestic waste incineration plants, especially the sample gas pretreatment system, the design of sample gas pretreatment system is analyzed and explained, which can provide reference for similar design work in the future.

Keywords: Sample gas; Pretreatment; Error; Overall design

1. CHARACTERISTICS OF SAMPLE GAS PRETREATMENT SYSTEM

In the past, the design and development of on-line infrared system has been paid more attention to. However, from the perspective of actual engineering construction and CEMS overall performance, the quality of sample gas pretreatment system is very important, and it can be said that no matter how much emphasis is placed on its importance. The sample gas pretreatment system has the following important features[1-8].

Analysis process bottleneck characteristics: the actual working environment is relatively complex, and the technology of directly sampling the temperature, humidity and dust content of the measured gas can not meet the needs of the analyzer. Moreover, many analyzers themselves have high requirements for working environment and expensive equipment, which are very "delicate" and need pretreatment system to process the sample gas in advance. Therefore, the overall accuracy and accuracy of the on-line infrared system come not only from the accuracy of the analyzer, but also from the pretreatment performance of the pretreatment system for the sample gas.

Process complexity: in some high requirements or complex working conditions, the sample composition is complex and there are various interference components, which can not be directly analyzed and tested. The analyzed components and interference components must be separated through pretreatment and separation process. The subjects involved are complex, and the types of equipment and materials are complex, which requires high requirements for the design of sample sampling system and the construction of engineering personnel.

Customization characteristics: almost all sample processing systems are customized according to the actual environment. Due to the complex weather and practical

application environment (such as high temperature, high humidity, geographical location, etc.), there are many special designs in the design of sample processing system. Each sample processing system also needs separate inspection and test, and the test requirements of sample processing system under different working conditions are not completely consistent. Almost all sample pretreatment systems are "customized" and have no mass production.

2. FUNCTION OF SAMPLE GAS PRETREATMENT SYSTEM

Most of the sample pretreatment systems are customized and developed according to the actual situation, and the focus and process of implementation, operation, management and maintenance are also different. Generally speaking, the basic functions of sample pretreatment system can be summarized as follows: sample extraction, sample transmission, sample processing, sample emission, monitoring and control of sample performance and other functions.

3. PERFORMANCE OF SAMPLE GAS PRETREATMENT SYSTEM

The degree to which a sample pretreatment system or its components can achieve a predetermined function is called a performance characteristic of a sample processing system. Generally speaking, it can be divided into three categories: key performance parameters, influence quantity, specification scope and specified value.

The key performance parameters refer to the range, allowable error and numerical value, which are the core basis for the design of sample pretreatment system;

The influence quantity refers to the influence of the external environment on the performance of the sample pretreatment system and its components (such as ambient temperature, pressure, etc.), in many cases, it refers to the working environment of the sample pretreatment system, and sometimes refers to the impact of the sample pretreatment system and its components on its external environment.

Specification range and specified value are mostly used to describe the value or range of measured, monitored, provided or allowed settings. The function of sample pretreatment system required by different working conditions is not the same, and it is restricted by various factors (some even include local meteorological and atmospheric conditions). Many performance parameters need to be determined according to the actual environment and actual samples, mainly including: lag time, volume error, dilution error, comprehensive error, leakage rate, etc.

4. OVERALL DESIGN OF SAMPLE GAS PRETREATMENT SYSTEM

From the point of view of the actual project, the author

hopes to provide more help to the engineering designers.

4.1 Sample sampling design

The basic requirements of sample sampling can be summarized as follows: complete the separation of sample flow without changing the characteristics of typical chemical components of process industrial fluid. The fundamental purpose of this method is that the sampling of samples should meet the needs of subsequent analytical instruments, and should reflect the required component characteristics as much as possible.

In the actual working environment, it is usually necessary to carefully consider the sampling point, the type (material) of the sampling probe, the length and orientation of the sampling probe according to the current application environment.

In order to avoid mixing, the sampling point should be selected as long as possible.

In order to reduce the lag time as much as possible, the rapid circulation loop composed of actual process pressure difference is beneficial to the overall process control.

The requirements of the instrument itself should be fully considered, and the sampling position should be reasonable and suitable for engineering installation and maintenance. In the actual engineering construction, especially in the environment where the sample gas mixture is complex and there are more particles, it is necessary to avoid drilling holes on the pipe wall for direct sampling, so as to avoid the influence of flow rate and pipe wall oxidation on the representativeness of the sample; and to avoid sampling in the dead corner where there may be pollution or gas, moisture, dust and so on.

4.2 Sample transfer design

The key to the design of sample transmission is to reduce the delay time (from sampling point to analyzer) as far as possible under the premise of ensuring the quality of sample gas transmission. Due to the complexity of the actual working conditions, it is difficult to meet the requirements of instrument testing, which leads to the necessity of sample transmission. In the actual working environment, sometimes the distance of sample transmission may be as long as tens of meters. Therefore, it is crucial to avoid "qualitative change" of sample gas in the process of transmission, which mainly includes: phase change must be prevented (sample gas sample should be completely kept in gas state during transmission); temperature of sample should be ensured; extreme environment (such as high temperature and high pressure) must be avoided; transmission sealing between sampling point and analyzer must be ensured to prevent it. The chemical reaction, condensation, dust adsorption, leakage and external gas mixing of trace gases in the sample are caused by the above reasons.

4.3 Sample heat tracing / insulation design

The main points of sample heat tracing / heat insulation can be summarized as follows: the external environment is very unstable during the pipeline transmission of sample gas in different periods. In order to reduce the impact of external environment on the sample gas, it is necessary to carry out the heat tracing or heat insulation design to ensure the stability of the sample gas.

Sometimes it is necessary to use heat tracing to prevent the change of sample concentration caused by condensation in the transmission process; for the sample gas which is easy to condense and crystallize, heat tracing is often used to reduce the condensation or crystallization of the detected components in the sample gas as far as possible.

In order to reduce the adsorption effect of pipeline.

Therefore, the basic goal of the sample heat tracing / insulation design is to ensure that the phase state and composition of the sample gas will not change due to temperature change.

The common heat tracing methods are steam tracing and electric heat tracing. In most cases, heat tracing and heat insulation should be considered at the same time.

4.4 Sample treatment design

The purpose of sample pretreatment is to ensure that a representative sample gas can be obtained within the shortest delay time, and the sample gas state (temperature, pressure, flow rate and cleanliness, etc.) is suitable for the operation conditions of the analyzer under the premise that the concentration of the detected gas is not lost as far as possible. Generally speaking, in the design of sample pretreatment system, decompression, cooling (some systems are heat preservation), dust removal, water removal, gasification and other treatment are usually carried out to make the sample transfer. This step is usually referred to as "sample preliminary treatment". According to the needs, it may be necessary to carry out fine filtration, drying, pressure relief, current limiting, etc. before being sent to the analytical instrument. Step treatment is often referred to as "sample master processing". Its functions can be summarized as follows:

4.4.1 Flow control

Mainly flow isolation (cut-off) and flow rate regulation, the most commonly used is the valve, usually divided into isolation valve, control valve, directional valve, limit valve, safety valve.

4.4.2 Pressure regulation

In the process of sample gas transmission, the transmission accuracy refers to the accuracy of pressure regulation, which depends on the measurement characteristics required by the analyzer; the response speed refers to the reflection speed of the pressure distribution in the whole sample gas processing system which changes with the operation of the system pressure regulating valve. Due to the high expansion performance of the gas itself, the response speed is generally relatively fast; the cut-off capacity refers to the sample pretreatment system. When there are multiple branches in the system, the gas sample can be cut off quickly under the premise of realizing the pressure regulation ability.

The common gas pressure reducing valves include ordinary pressure reducing valve, high pressure reducing valve, back pressure regulating valve, double-stage pressure reducing valve and pressure reducing valve with heat tracing.

4.4.3 Temperature regulation

If the sample line is directly exposed to the air, the heat contained in the sample gas is relatively small relative to the surface area (heat dissipation area) of the sample

pipeline. Therefore, as long as the external climate environment is not very special (such as long-term high-temperature exposure), the sample pipe length is enough, and it is generally not necessary to consider the cooling treatment of the sample (see the previous chapter on heat tracing for heat preservation treatment). However, in order to shorten the pipeline length or adapt to the extreme external environment, sometimes it is necessary to carry out separate cooling treatment.

4.4.4 Dust removal treatment:

At present, the precipitators used in the gas analyzer are divided into filtration dust removal, electrostatic dust removal, water washing dust removal and cyclone separation dust removal.

4.4.5 Dehumidification and drying

In industry, when the dew point of gas sample will reach normal temperature, it is called dehumidification. The most common dehumidification method is to first reduce the temperature to about 5 degrees, then remove water, and then heat the gas sample to 40-50 degrees for analysis. The water and dehumidification technology of gas is not only used for gas concentration analysis, but also relatively mature.

There are four common water removal methods in the sample pretreatment system: cooling, inertia separation, filtration and desiccant adsorption.

5. ACTUAL CASE ANALYSIS OF SAMPLE GAS PRETREATMENT SYSTEM

This section provides a complete product case of heated prefilter gas sampling probe (patent name: gas sampling probe assembly, Patent Grant No.: 201320756826.1, date of authorization: July 16, 2014, inventor: Yan Shi, applicant: Chongqing Chuanyi Analytical Instrument Co., Ltd.). The patent solves the problems of probe blockage and flue gas corrosion prevention of incinerator in a low-cost way. For the relevant technical data, please refer to the website of the State Patent Office.

6. CONCLUSION

Although most of the sample pretreatment systems are customized and developed according to the actual situation, the focus and process of implementation, operation, management and maintenance are also different. It is generally considered that the main functions of the sample pretreatment system are sample sampling, sample transfer design, sample heat tracing / insulation and sample handling.

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Study on The Safety of Steel Tube Bailey Beam Column Support System

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Abstract: In this paper, based on the Nanjing Liang Expressway Overpass Beijing Kowloon railway overpass project, the key components of cast-in-place bracket system of swivel bridge are modeled and analyzed by using finite element software, and the safety reserves of different components of the bracket are compared. Through calculation and analysis, it is shown that the stress and deformation of key components of cast-in-place support meet the specification requirements, and the safety factors of each component are quite different. Reasonable local strengthening measures and key monitoring should be taken for the parts with less safety reserve.

Key words: Swivel bridge; Support design; Finite element analysis; Safety assessment

1. INTRODUCTION

In recent years, in order to meet the needs of social development for traffic construction, new lines inevitably intersect with existing lines. The swivel construction technology has the advantages of simple construction process and no influence on the traffic under the bridge, which is widely used in the construction of cross line projects. At present, the cast-in-place support structure system of large-span wide bridge is complex, the calculation process is complicated, and there are many design considerations. In order to ensure the quality and safety of the construction of large-span wide swing bridge, it is of great significance to design and evaluate the safety of temporary support.

2. PROJECT OVERVIEW

2 × 75m T-type Rigid Frame Prestressed concrete box girder is adopted for the overpass crossing Beijing Kowloon Railway. The full width of the whole bridge is 32.7m. The swivel construction method is adopted for the bridge. After the cast-in-place construction on the east side of Beijing Kowloon Railway is completed, it is rotated in place by 85.3 ° anticlockwise.

3. OVERALL CONSTRUCTION SCHEME

The main bridge of the overpass crossing Beijing

Table 1 Calculation results of stress and deformation

position	stress		Stress safety factor	deformation			Are the requirements met
	Calculated value MPa	Allowable value MPa		Calculated value mm	Allowable value mm	Deformation safety factor	
Near the side pier	56.609	190	3.356	2.753	10.50	3.814	yes
Mid span	106.158	190	1.790	5.939	10.50	1.768	yes
Near ZHONGDUN	102.162	190	1.860	6.577	7.50	1.140	yes

Kowloon Railway adopts the construction scheme of bracket assembly, and the specific construction steps are as follows:

3.1 Foundation construction. Before the construction of pile foundation, pile test should be carried out to test the bearing capacity of single pile. During foundation construction, 16mm thick steel plate and bolt should be embedded in the foundation according to the design position of steel pipe column.

3.2 After the foundation concrete reaches a certain strength, the steel pipe pile shall be installed vertically, and the bottom of the steel pipe column shall be firmly connected with the embedded bolts. After the installation of each row of steel columns, the steel pipes are connected with channel steel.

3.3 After the installation of I-beam at the top of steel pipe pile is completed, Bailey beam shall be installed on the top of it. When Bailey beam is installed in place, Bailey beam and distribution beam shall be fixed by U-shaped clamp.

3.4 According to the design requirements and construction scheme, install the buckle type support. After the installation of the buckle type support, adjust the jacking height to the design position, and finally install the I-beam on the top of the disc buckle support.

4. SAFETY ANALYSIS OF CAST-IN-PLACE SUPPORT STRUCTURE

The finite element software MIDAS civil is used to establish the structural model and carry out the static analysis. Each member in the structural model is used to calculate the strength and stiffness of the key components of the support.

4.1 Finite element calculation of key structure of support Steel pipe pile top distribution beam (beam 1). The stress and deformation calculation results of the distribution beam are shown in Table 1. The calculation results show that the maximum stress and deformation of the steel pipe pile top distribution beam meet the requirements of the code.

Bailey beam. The results of finite element stress and

deformation calculation are shown in Table 2. The results

show that the maximum stress and deformation of Bailey beam meet the requirements.

Table 2 Calculation results of stress and deformation

position	stress			deformation			Are the requirements met
	Calculated value MPa	Allowable value MPa	Stress safety factor	Calculated value mm	Allowable value mm	Deformation safety factor	
Near the side pier	103.800	275	2.649	1.193	15.00	12.530	yes
Mid span	148.700	275	1.849	7.695	22.50	2.924	yes
Near ZHONGDUN	274.862	275	1.001	4.250	11.25	2.647	yes

Bailey beam top distribution beam (beam 2). The results of finite element stress and deformation calculation are shown in Table 3. The calculation results show that the maximum stress and

Table 3 calculation results of stress and deformation

position	stress			deformation			Are the requirements met
	Calculated value MPa	Allowable value MPa	Stress safety factor	Calculated value mm	Allowable value mm	Deformation safety factor	
Near the side pier	61.338	190	3.098	0.355	2.50	7.042	yes
Mid span	60.870	190	3.121	0.361	2.50	6.925	yes
Near ZHONGDUN	72.736	190	2.612	0.482	2.50	5.187	yes

Long I-shaped steel is used on the top of the buckle type support. The results of finite element stress and deformation calculation are shown in Table 4. The calculation results show that the maximum stress and deformation of I-beam meet the requirements.

Table 4 Calculation results of stress and deformation

position	stress			deformation			Are the requirements met
	Calculated value MPa	Allowable value MPa	Stress safety factor	Calculated value mm	Allowable value mm	Deformation safety factor	
Near the side pier	118.674	190	1.601	1.104	3.00	2.717	yes
Mid span	118.637	190	1.602	1.104	3.00	2.717	yes
Near ZHONGDUN	118.538	190	1.603	1.104	3.00	2.717	yes

3.2 Comparison of safety factors of key components

The comparison of stress safety factor and deformation safety factor of each component of cast-in-place support system is shown in Fig. 1 and Fig. 2.

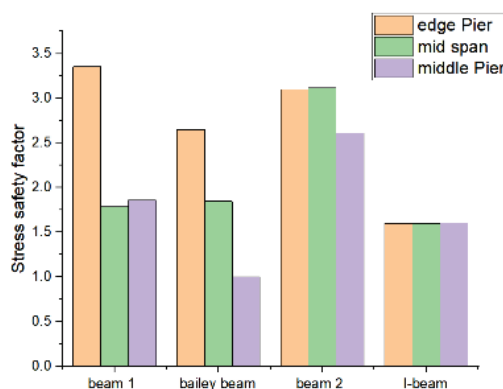


Figure 1 Stress safety factor

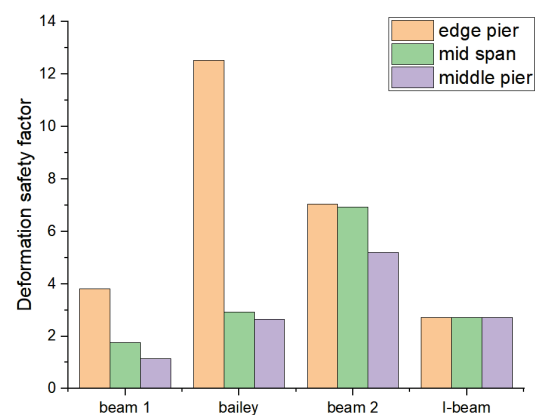


Figure 2 Deformation safety factor

It can be seen from Fig. 1 and Fig. 2: in terms of stress safety factor, the stress safety factor of each component near the side pier is relatively large, and the safety reserve is high; the stress safety reserve of Bailey beam near the middle pier is low, and its stress is close to the standard limit value. Therefore, the vertical bar of Bailey beam attached to the middle pier should be strengthened during site construction.

In terms of deformation safety factor, Bailey beam deformation safety coefficient near the side pier is larger, and the safety reserve is higher; the deformation safety

reserve of steel pipe pile top distribution beam near the middle pier is low, close to the standard limit value, so the deformation of this position should be monitored in the field construction.

4.CONCLUSION

In this paper, the key structural safety problems of cast-in-place support are studied:

The composite structure system of steel pipe pile and Bailey beam can meet the requirements of bearing capacity and deformation of temporary support structure of long-span wide swing bridge; according to the comparative analysis, the stress safety factor of Bailey beam near the middle pier is small, and the stress is close to the limit value, so it should be strengthened.

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Comparative Study on The Technique of Men's 20km Race Walk Champion and Runner - Up in Jakarta Asian Games

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Abstract: In this paper, literature review, image analysis, mathematical statistics and comparative analysis were used to compare and study the technology of men's 20km race walking champion and runner up in The Jakarta Asian Games, and the following conclusions were drawn: (1) Compared with Shanxi Lihe, Wang Kaihua has a larger stride length at high and low speed, which is closer to the stride length of the world's elite athletes. However, wang Kaihua has a slight disadvantage in terms of stride frequency because of his uneven left and right single steps. (2) Technically, although wang Kaihua's distance between the back pedal and the front pendulum is larger than that of Shanxi Lihe, the force of the left and right back pedal and the front pendulum is uneven, which affects the action effect. At the same time, Shanxi Lihe needs to increase the distance between the back pedal and the front pendulum. (3) It can be seen from the flying distance and body fluctuation distance that Wang Kaihua has stronger balance ability in the flying distance than Shanxi Li, but the body fluctuation distance is larger than the reference index of body fluctuation distance of the world's high-level athletes. Shanxi Li and when walking at high-speed body fluctuation distance is large. (4) Among the changes in the Angle of each joint, Wang Kaihua's upper limb has a small swing amplitude and is unbalanced from right to left when walking at high and low speed. However, his lower limb has a larger swing amplitude than Shanxi Lihe's, and his hip joint is more flexible and time-sensitive. (5) From the Angle of thigh overlap, both of them did not reach the standard reference value. The phenomenon of Shanxi Li and the back lift was larger than that of Wang Kaihua. In addition, when wang Kaihua landed on the left side, the Angle of his left side landing was smaller, while the distance of his head rising and falling was larger when he supported on the left side. Therefore, it is suggested that

Table 1: Browse basic information of athletes

The name	Date of birth	Height/m	Weight/kg	The results of the competition	best
Kai-hua wang	1994/02/16	175cm	65kg	1:22:04	1:7:30 p.m.
Shanxi and	1996/02/15	164cm	54kg	1:22:10	1:20:50

2.2 Research Methods

2.2.1 Literature method

According to the demand of the research purpose and content of this paper, in order to "walk", "technology" as the keyword to retrieve Chinese hownet, get 406 articles, and select 5 journals to read, access to the capital sports college library books about walking, technology, obtain knowledge about walking and technology, provide reliable

Wang Kaihua should improve the balance of the left and right foot frequency, the balance of the left and right front pendulum and the distance of the back push, so as to enhance the effect of the movement. Further reduce the left and right flying fluctuation deviation, reduce the body fluctuation distance, relax the lower limb in the process of walking to increase the overlap Angle of the two thighs, and increase the swing arm amplitude of the upper limb in the training, especially the middle and lower arm Angle during the swing process, improve the overall technology efficiency and standardization. In the process of walking, Li He should improve his stride length and step length, strengthen the distance from the ground to the back, and at the same time improve the distance from the front swing. Reduce the flying distance and body fluctuation distance while walking at high speed. In the lower extremity swing should improve the degree of lower extremity relaxation, increase the swing amplitude.

Keywords: 20km Race Walk; Timeliness; Economy

1.PURPOSE OF THE STUDY

Excellent men's 20 km race walking athletes in China and Japan's Shanxi and the Asian games show walking technology comparative analysis research, find our country athletes kai-hua wang on technical deficiencies, draw lessons from Shanxi and some advantages of the technology, make kai-hua wang walking technology get breakthrough, again refresh the best results [1-5].

2. RESEARCH OBJECTS AND METHODS

2.1 Research Objects

The basic skills of Wang Kaihua, the champion of men's 20km race walking in 2018 Asian Games in Jakarta, and Shanxi Lihe, the runner-up, were taken as the research objects, and their competition skills were analyzed, as shown in Table 1.

theory basis for this article.

2.2.2 Image analysis

Using the Switzerland Dartfish sports video technical and tactical analysis system, the Dartfish sports video, which won and finished the men's 20km walk race at the Asian Games, was made into image data and analyzed, to improve the systematic and scientific nature of professional research.

2.2.3 Mathematical statistics

The basic movement technical Angle and movement distance of the athletes were calculated numerically with Excel2003, and the dynamic data of the athletes' race-walking technology were statistically sorted out to obtain the basic data of research and analysis.

2.2.4 Comparative analysis

Through statistical comparison and analysis of the technical data of the two athletes in the process of high speed and low speed walking, the appropriate Angle and distance are obtained, the technical advantages of Wang Kaihua and Shanxi Lihe are found out, and the technical advantages and improvements of Wang Kaihua are clarified.

3. STATISTICAL ANALYSIS OF IMAGE DATA

Image analysis and data statistics are used to interpret the basic techniques of Wang Kaihua and Li He in Shanxi at high and low speeds. Based on the statistical analysis of the technical data of Wang Kaihua and Shanxi Lihe in the high and low speed walking stage of the Asian Games by using the biomechanical measurement method, this paper improves the basic technical movements of China's 20km race walkers to absorb the superior movements of other countries' excellent athletes.

4. THE RESULTS OF THE STUDY

4.1 Step length and step frequency

The relationship between step length and stride frequency can directly affect the final result in the whole race-walking process, and influence and restrict each other. Only when the stride length and stride frequency are closest to the standard data value can the athlete achieve the best

Table 2: Technical stage time statistics

Step size (m)					Step frequency (step /min)			
	High speed		Low speed		High speed		Low speed	
	On the left	right	On the left	right	On the left	right	On the left	right
Kai-hua wang	1.22	1.19	1.17	1.16	203	213.6	213	216.6
Shanxi and	1.16	1.15	1.16	1.15	215.8	219.6	214	210

4.2 Distance between the back pedal and the front pendulum

Table 3: Correlation distance index statistics

Front swing distance (m)					Distance to the rear push (m)			
	High speed		Low speed		High speed		Low speed	
	On the left	right	On the left	right	On the left	right	On the left	right
Kai-hua wang	0.37	0.25	0.34	0.29	0.45	0.55	0.47	0.44
Shanxi and	0.19	0.24	0.23	0.27	0.39	0.45	0.42	0.40

From the perspective of biomechanics and physics, the strength and distance of the hind leg can determine the effect of the athlete in the course of walking. By table 3 feet after long distance you can see, from high and low speed in the process of kai-hua wang after long distance is bigger than the Shanxi and relatively, but after kai-hua wang's foot pedal distance than in Shanxi and the difference between the relatively larger, after long distance decreased by low speed to high speed and large relative to the Shanxi, such effects would be to walk in the process of action. From another point of view, the impact of the swinging leg on the ground is also very significant. Swinging leg. The distance is a very has the reliability

performance. By table 2 data analysis, kai-hua wang left single using of expressway are 1.22 m long, single step by step right 1.19 m long, low speed walking left single step by step length is 1.17 m, right single step by step length is 1.16 m, and Shanxi and high-speed go left single step by step 1.16 m long, single step by step right 1.15 m long, slow walk left single step by step length is 1.16 m, single step by step length is 1.15 m, right can be seen from the single step by step length contrast kai-hua wang step in the process of high and low speed walk is better than that of Shanxi and, belong to stride type player. Kai-hua wang high-speed walking step left leg stride length is 203 / min, step right leg stride length is 213.6 / min, when low speed walking steps left leg stride length is 213 / min, step right leg stride length is 216.6 / min, and Shanxi step left leg stride frequency and high speed is 215.8 / min, step right leg stride length is 219.6 / min, lower left leg steps stride length is 210 / min, step right leg stride length is 214 / min, Shanxi and left at low speed to high speed walk step frequency increased by 1%, single step right stride length increased by 4%, on average, increased by 2.5%, From low speed to high speed, the left step frequency of Wang Kaihua increased by 5%, and the right step frequency increased by 1.4%, with an average increase of 3.2%. The average single step frequency of low-speed travel time is smaller than that of Shanxi Lihe, and the proportion of the increase of the average step frequency in the process from low speed to high speed is large. Moreover, the single step frequency of Wang Kaihua is not balanced and has poor stability, as shown in Table 2.

analysis indicators, formerly set distance can see kai-hua wang high, low speed when walking around. The distance is greater than and Shanxi Province, but kai-hua wang about the difference between the legs. The distance than in Shanxi and the difference between the distance of two legs, as a result of kai-hua wang after push from relative to is bigger than in Shanxi and the, so walking in the high and low, left and right leg. The distance is bigger than in Shanxi and, so in the process of walking the action effect of kai-hua wang will be affected, such as Table 3.

4.3 Flight distance and body fluctuation distance

Empty distance can reflect the athletes in the walking process balance, from the analysis of the data on the table

4 can be emptied out kai-hua wang expressway left leg distance is 0.24 m, right leg lift distance is 0.23, low-speed left empty distance is 0.28 m, right leg lift distance is 0.25 m, and Shanxi expressway is left leg lift distance is 0.24 m, right leg lift distance is 0.20 m, low speed walking left leg lift distance is 0.17 m, right leg lift distance of 0.19 meters, it can also side reflects kai-hua wang balance ability than Shanxi and balance ability, The difference between the left and right legs in the air is 0.03m larger than that of Wang Kaihua at high speed, and the difference between them at low speed is 0.1, which is slightly larger for Wang Kaihua. So Wang kaihua has a slight advantage over Shanxi Lihe in this technique. On the other hand, in the long-distance prediction process of race walking, the referee will judge whether there is foul in the technique of segment athletes mainly by the size of head fluctuation. Ivan Nikki from Table 4: Distance index statistics

Flying distance (m)					Body undulation distance (m)	
The name	High speed		Low speed		High-speed,	low-speed
	On the left	right	On the left	right		
Kai-hua wang	0.23	0.24	0.28	0.25	0.10	0.11
Shanxi and	0.24	0.20	0.17	0.19	0.11	0.08

4.4 Characteristics of Angle changes of upper and lower limbs during race walking

Interpretation, from the analysis of table 5 kai-hua wang in the process of expressway centre-left right rear pendulum Angle is about 63.4 degrees, the average after the pendulum Angle of 63.4 degrees, the forearm Angle is about 44.3 degrees, the average size than the Angle of 44.3 degrees, 58.1 degrees is at low speed when the left size than the right size than the Angle of 78.3 degrees, the average size is 64.2 degree Angle, walking in low-speed, left after the pendulum Angle is 60 degrees, after a pendulum Angle is 51.7. The rearward swing Angle of Shishanhe expressway is 62.0 degrees when it leaves on the left and 62.9 degrees when it leaves on the right. The average backswing Angle is 62.45 degrees; the Angle between the left and the forearm is 65.4 degrees; the Angle between the right and the forearm is 84.6 degrees; the average backswing Angle is 75 degrees; in low-speed travel, the Angle between the left and the forearm is 63.9 degrees; the Table 5: Statistical table of swing arm and swing leg angles

		Back swing Angle of big arm			Angle between forearm and			Two legs Angle		
		On the left	the right	On average,	On the left	right	On average,	On the left	the right	On average,
Wang Kaihua	Expressway	63.4	63.4	63.4	44.3	44.3	44.3	46.9	46.3	46.6
Shanxi Lihe	Expressway	62	62.9	62.45	65.4	84.6	75	41.3	44.9	43.1
Wang Kaihua low speed		60	51.7	55.9	58.1	70.3	64.2	44.3	45.2	44.8
Shanxi Lee and low speed		62.8	53.4	58.1	63.9	63.6	63.7	45.6	46.2	45.9

Two thigh included Angle of this design is according to the athlete big rotor position location, and then connected with the swinging leg heel kick toe after the determine of connections between two thigh included Angle degree, can be seen from table 5 statistics analysis kai-hua wang high-speed walking left from 46.9 degrees when two thighs,

Russia found that the most appropriate distance between 4-6cm of head fluctuation is around 1938.^[1] However, in the context of constantly refreshing world race walking results, continuous studies in recent years have found that the head fluctuation distance of elite athletes is 5-8cm, high-speed kai-hua wang as body rolling distance is 10 cm, low speed is 11 cm, and the body of the expressway in Shanxi and distance is 11 cm, the body of the low-speed rolling distance is 8 cm, analysis on the data from kai-hua wang than in Shanxi Province and on the left and right balance for some, but closer to Shanxi and world-class reference value, and so under the same conditions, the referee kai-hua wang conceded a chance under the naked eye observation will be larger, chances and decisions at high speed in Shanxi than wang huada, such as table 4.

Angle between the right and the right-to-size ratio is 63.6 degrees; the left backswing Angle is 63.75 degrees; and the right backswing Angle is 62.8 degrees. In the swinging Angle of the upper limb, Wang Kaihua's swinging Angle varies greatly from high speed to low speed, and the left and right swinging Angle is not stable, while Shanxi Lihe's swinging Angle is much more stable than Wang Kaihua's. The Angle between the large forearm and the small forearm is determined by the force exerted by the elbow while the athlete walks at high speed. Russian scientific research believes that the degree of the Angle between the two large forearm depends on the walking speed. The faster the speed is, the larger the Angle between the size ratio is. In the data analysis, the Angle of Wang Kaihua's arms is smaller than that of Shanxi Lihe, and the swing amplitude is not as large as that of Shanxi Lihe. Therefore, the swing amplitude of the upper limbs should be strengthened and the reference value should be approached in the process of high-speed walking.

right from the two thighs Angle of 46.3 degrees, 44.3 degrees is low speed walking away from the two left thigh and right away two thigh included Angle is 45.2 degrees, and Shanxi, and left at high speed from 41.3 degrees are two thighs, right away two thigh included Angle is 44.9 degrees, low-speed left from two thigh included Angle is

45.6 degrees, Right from two thigh included Angle is 46.2 degrees, from high to low speed walking kai-hua wang two thigh included Angle decreases, and low speed, the left and the right thigh Angle degree difference is big, and the low speed walking Shanxi benefit from higher to lower than the big, walking in high speed in pursuit of stride frequency and make the hip relatively tight, small steps, kai-hua wang walking speed than the Shanxi and two thigh included Angle is larger, and around the difference between the two thighs degree Angle smaller than Shanxi and, on the one hand show kai-hua wang legs movement range than in Shanxi Province and big, better hip flexibility, action of timeliness, left and right balance stability is strong, The body movement should be relaxed relative to the Shanxi Li and in the process of walking.

4.5 Overlap knee joint Angle and landing Angle

In this paper, the overlapping knee Angle of the thigh can reflect the lower extremity relaxation level in the process of walking. The more relaxed the overlapping knee Angle is in the backswing stage, the greater it will be. Obtained from table 6 can analyze kai-hua wang expressway left leg overlapping knee joint Angle is 95.6 degrees from the ground, right leg off the ground overlapping knee joint Angle is 92.3 degrees, the average overlap knee joint Angle is 93.95 degrees, low-speed left from the overlap of knee joint Angle is 98.5, right from the overlap of knee joint Angle is 98.7 degrees, the average overlap knee joint Angle is 98.6, Shanxi and walking on the left leg overlapping knee joint Angle is 91.5 degrees from the ground, right leg off the ground vertical knee joint Angle is 93.8 degrees, the average overlap knee joint Angle is 92.65 degrees, When traveling at low speed, the left Angle of the overlapping knee joint is 95.9 degrees, while the right Angle of the overlapping knee joint is 95.8 degrees, and the average overlapping knee joint Angle is 95.75 degrees. Walking kai-hua wang high or low speed is greater

than the average overlap of knee joint Angle and Shanxi Province, under the condition of the same race after liao situation of Shanxi and will be a little more serious than kai-hua wang, but two people are a little overlap of knee joint Angle is relatively small, chung wa respect for the world's best research determine that walker thigh overlap Angle is 100 degrees to 110 degrees^[3,4]. Therefore, both Wang Kaihua and Shanxi Lihe failed to reach the corresponding reference index, which may be caused by the nervous movement in the process of high-speed walking and the fast movement in the process of acceleration. Therefore, the relaxation degree of the calf after pushing off was strengthened.

Analysis and interpretation of landing Angle: Table 6 shows that the right foot landing Angle of Wang Kaihua at high speed is 22.0 degrees, the left foot landing Angle is 19.3 degrees, and the average landing Angle is 20.65 degrees. The left foot landing Angle of Wang Kaihua at low speed is 22.1 degrees, the right foot landing Angle is 19.9 degrees, and the average landing Angle is 21 degrees. Shanxi and high-speed walk right foot touchdown point was 22.4 degrees, the left foot landing Angle is 23.0 degrees, the average land Angle is 22.7 degrees, low speed walking foot touchdown Angle is 22.8, right foot touchdown point of 24 degrees, an average of 23.4 degrees Angle, the world's elite athletes foot touchdown Angle of 25 degrees or so, while kai-hua wang and Shanxi, and around the touchdown point of the reference is not reached 25 degrees, and Shanxi and high low-speed landing Angle is larger than kai-hua wang, closer to the reference and 25 degrees. In addition, in the process of high-speed walking, wang Kaihua's left foot landing Angle is too small, indicating that his left side support stage has a large overhead fluctuation distance, which reduces the stability of race-walking technique.

Table 6: Statistical table of overlap of two thighs and Angle of landing of two feet

	The legs overlap at an Angle			Angle your feet to the ground		
	On the left	right	On average,	On the left	right	On average,
Wang Kaihua Expressway	95.6	92.3	93.95	19.3	22.0	20.65
Shanxi Lihe Expressway	91.5	93.8	92.65	23.0	22.4	22.7
Wang Kaihua low speed	98.5	98.7	98.6	22.1	19.9	21
Shanxi Lee and low speed	95.9	95.6	95.75	22.8	24	23.4

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 the conclusion

5.1.1 Compared with Shanxi Lihe, Wang Kaihua has a larger stride length at high and low speed, which is closer to the stride length of the world's elite athletes. However, wang Kaihua has a slight disadvantage in terms of stride frequency because of his uneven left and right single steps.

5.1.2 Technically, although the distance between the back pedal and front pendulum of Wang Kaihua is larger than that of Li He in Shanxi, the force of the left and right back pedal and front pendulum is uneven, which affects the action effect. At the same time, Li He in Shanxi needs to increase the distance between the back pedal and front pendulum.

5.1.3 It can be seen from the flying distance and body fluctuation distance that Wang Kaihua has stronger

balance ability in the flying distance than Shanxi Li, but the body fluctuation distance is larger than the reference index of the body fluctuation distance of the world's high-level athletes. Shanxi Li and when walking at high-speed body fluctuation distance is large.

5.1.4 In the variation of various joint angles, Wang Kaihua's upper limb swings in high and low speed travel are small and uneven, but his lower limb swings are larger than Shanxi Lihe's, his hip joint is more flexible and his movement is more time-sensitive.

5.1.5 From the Angle of thigh overlap, both of them failed to reach the standard reference value. The phenomenon of Shanxi Li and the back lift was greater than that of Wang Kaihua. In addition, when wang Kaihua landed on the left, the Angle of his left landing was small, while the distance of his head rose and fell greatly when he supported on the

left.

5.2 suggest

5.2.1 Wang Kaihua shall improve the balance of the left and right foot frequency, the balance of the left and right front pendulum and the distance of the back push, so as to enhance the effect of movements. Further reduce the left and right flying fluctuation deviation, reduce the body fluctuation distance, relax the lower limb in the process of walking to increase the overlap Angle of the two thighs, and increase the swing arm amplitude of the upper limb in the training, especially the middle and lower arm Angle during the swing process, improve the overall technology efficiency and standardization.

5.2.2 In the process of walking, Shanxi Lihe should improve the stride length and step length, strengthen the distance of kicking the ground behind, and at the same time improve the distance of swinging forward. Reduce the flying distance and body fluctuation distance while walking at high speed. In the lower extremity swing should improve the degree of lower extremity relaxation, increase the swing amplitude.

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The Present Situation and Countermeasures of Integrating Leisure Sports into College PHYSICAL Education

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Abstract: With the sustainable development of China's economy, people's living standards gradually improve and enhance, leisure sports as a new way of leisure and entertainment more and more popular by people. In modern life, leisure sports have also entered into people's lives, many people are using leisure sports to exercise their bodies, to achieve the combination of body and mind and the external environment, leisure sports are also getting more and more attention. This paper analyzes the present situation of leisure sports integrated into college physical education and puts forward some reference countermeasures, hoping to have a certain guiding effect on practical application.

Keywords: Leisure Sports; Teaching; Status Quo; Countermeasures

1. THE CURRENT SITUATION OF LEISURE SPORTS TEACHING IN COLLEGES AND UNIVERSITIES

1.1 Students' enthusiasm for leisure sports teaching is not high

The students' low enthusiasm for leisure sports teaching mainly lies in their weak awareness of leisure sports. It is generally manifested in the lack of attention, low degree of cooperation and neglect of teachers' requirements for leisure sports. According to the survey, the attitude of most college students towards physical education in Our country is generally so. The main reasons are as follows: First, parents and students despise physical education. Parents instilled in students from an early age to learn more cultural classes, less participation in physical exercise, because physical exercise is too waste of time, do not play any decisive role in the examination of students. In recent two years after the state introduced appropriate adjustment of sports scores, some parents began to encourage students to go out of the house into the sports field to exercise; The second is the problem of China's education system. Our country is still based on exam-oriented education, for this kind of time-consuming, short term does not see significant results of the project, inevitably choose to alienate or give up. Third, students lack the substantive knowledge of leisure sports and do not understand the benefits of consuming time and energy to do physical exercise. The idea of most of the students is to spend time and energy for the future without any help of leisure sports, it is better to spend some time in English and relevant professional knowledge, such as office software can help you in the future work, on the other content of the idea inevitably makes the college students' consciousness of leisure sports,

with less of the leisure sports teaching [1-4].

1.2 Limited funds for leisure sports teaching in colleges and universities

Most college education funding will be placed in the professional teaching, relatively low investment in sports teaching, make the disadvantages: the leisure sports teaching hardware facilities in venues, sports equipment, shortage of these two aspects, students enrollment increasing in recent years, the school initially establish a number of stadiums and sports equipment cannot meet the demand of current students, and the type and size for recreational sports teaching quality has the apparent effect, coupled with the late for venues, equipment management and maintenance is not timely, reduce the hardware facilities of life, brought obstacles for the development of leisure sports; Software facilities mainly manifested in the lack of qualified teachers, specific refers to the majority of PE teachers in colleges and universities for the leisure sports professional knowledge is less, not after the leisure sports professional training, teacher himself for a deep understanding of the concept of leisure sports, the less likely to require students to have a thorough understanding of leisure sports, it will appear some obstacles in the process of practical teaching, makes the recreational sports teaching quality cannot be guaranteed, which affects the enthusiasm of students of leisure sports of colleges and universities, and even many mainly leisure project in colleges and universities gradually disappear.

1.3 The content of leisure sports teaching in schools is single

The content of physical education in colleges and universities is mainly reflected in two aspects: one is that schools give priority to competitive sports; the other is that leisure sports are less. For some colleges and universities that have advantages in sports, it is the fundamental task of the school to pursue competition results and pay attention to the education of competitive sports. Therefore, colleges and universities with dominant sports will ignore the teaching of a few ordinary students in leisure sports and mainly focus on competitive sports. For those colleges and universities that do not give priority to sports, although they can satisfy most students to carry out leisure sports teaching, there are problems in teaching content and teaching methods. That some universities pay more attention to the teaching of humanities, science and technology, in the aspect of sports venues, equipment, project nature and is given priority to with sports colleges and universities there is a large gap, which makes them in

the leisure sports education content, teaching projects there is a limit, can't meet the diverse needs of the students for recreational sports, affected the enthusiasm of students in physical exercise.

2. COUNTERMEASURES ON THE PRESENT SITUATION OF SPORTS LEISURE TEACHING IN UNIVERSITIES

2.1 Improve students' attention to leisure sports teaching

At present, college students' cooperation with leisure sports education is not high, mainly because they do not understand the impact of leisure sports on individuals. In view of this situation, schools and physical education teachers should strengthen the publicity and introduction of leisure sports, which can be adopted in the following ways: First, appropriately improve the credits of leisure sports. According to the influence of exam-oriented education on students since childhood, once the credits of this subject are increased, students will attach more importance to leisure sports. Secondly, for the study of leisure sports can be divided into two parts - the theory and practice, during the class at ordinary times is pay attention to the students' practical ability also does not forget which runs through the theory, in imperceptible to make the students understand to the important role of leisure sports for students themselves to make the students with a pleasant attitude actively cooperate with teacher's teaching. In order to deepen students' understanding of leisure sports, in the final exam, theory is also added as the test content, with a small proportion of theory. Its purpose is to let students learn to use the correct method of physical exercise, rather than become a physical education teacher proficient in theory. In the end, schools should carry out more leisure sports activities, students are encouraged to actively participate in, also can organize series of activities such as: in college, grade, class, and even our bedroom to PK, for "sports star" honor, can also be the honor as a condition of the selection of outstanding cadres, outstanding student points, thus increasing encourage students to participate in leisure sports.

2.2 Colleges and universities should increase the investment in leisure sports teaching

From the analysis of the current situation of leisure sports teaching in colleges and universities, it can be seen that there are deficiencies in hardware facilities and software facilities, and only by improving the above deficiencies can leisure sports teaching be carried out smoothly in colleges and universities. For colleges and universities with insufficient venues and sports facilities, relevant departments of the state should increase their investment in the construction of sports facilities, and schools should also put the funds into practical use to strengthen the construction of sports facilities in schools. In addition to the construction in the early stage, the follow-up maintenance in the later stage is also an important link, which can extend the service life of the equipment, save the investment of school funds, and improve the utilization rate of sports facilities resources. However, at present, most schools have not made clear provisions on the management of venues and equipment. Therefore, it is necessary to improve the management system of school

sports venues and equipment, and make appropriate provisions on the use time, use mode, repair and maintenance of venues and equipment, so as to slow down the aging rate. As for teachers, PE teachers should keep pace with The Times timely change concept, for the lack of leisure sports related knowledge of physical education teachers should strengthen the study specialized knowledge, or to the leisure sports teaching experience the teacher learning, the concept of leisure sports in the thoughts, in theory, be familiar with the connotation of leisure sports, in practice to master the leisure sports skills in order to calculate a qualified teachers of leisure sports. In a word, it is necessary to strengthen the students' understanding and attention to leisure sports from the two aspects of schools and physical education teachers, improve their understanding and set up correct concepts, so that students can actively cooperate with teachers in the future teaching and actively participate in leisure physical education teaching.

2.3 Enrich the content of leisure sports teaching to meet the diverse needs of students

For colleges and universities sports strengths, their own hardware and software facilities is beneficial to develop the leisure sports, but as a result of these colleges and universities will be more focus on the competitive sports, ignoring the leisure sports teaching, appropriately increased leisure sports teaching, in order to meet the needs of other non-professional sports students of leisure sports, leisure sports for professional athletes at the same time also is helpful for its stretches the body, adjust the mentality, play better attitude in the competitive sports. For colleges and universities that are not strong in sports, it is more important to carry out leisure sports teaching. However, the current situation shows that the teaching items are outdated, which mainly focus on ball games and freehand exercises, but leisure sports are not involved. Schools should combine the characteristics of students to meet the needs of students for the purpose of appropriately expanding the range of students' choice of sports. In the selection of course content, in view of the different interests of each student in physical education and the time of specialized courses, the school can break the major and let these "like-minded" students form a class to carry out leisure physical education teaching, so as to make the choice of physical education more independent and diversified and meet the different needs of students for leisure physical education teaching.

3. CONCLUSION

With the increasingly fierce social competition, in addition to having certain professional knowledge, college students' good physical and mental state is also an indispensable weapon for future work, so it is very necessary to carry out leisure sports teaching in colleges and universities. Leisure sports teaching is of great significance in promoting the individual development of college students, guiding the good campus cultural atmosphere, and promoting their physical and mental development towards a healthy direction. Although at present a few deficiencies in terms of leisure sports education in colleges and universities, but the state, schools, related scholars for the understanding of

the important role of leisure sports have become increasingly clear, also take active leisure sports in colleges and universities teaching quality, change student's attitude toward leisure sports, improve the measures on construction of sports facilities in colleges and universities for the leisure sports education in colleges and universities to carry out the create more favorable conditions.

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Analysis of The Major Risks Faced by Successive Winter Olympics And Their Impact

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Abstract: Through literature review, comparative study, inductive deduction and logical analysis, this study identifies and divides the major risks faced by previous Winter Olympic Games. In the 23 Winter Olympic Games held from 1924 to 2018, the risk identification of the risky events collected from each Winter Olympic Games was carried out. Relevant suggestions are put forward to solve the problems, enriching the ways of economic preparation to stimulate the economy of the event, reasonably and effectively dealing with the international political resistance and intervention, and improving the positive information reporting ways of the media before the event can effectively reduce the risks before the event. Improve the site facilities preparation, strictly control the site facilities, quality and other issues. To improve the media's comprehensive publicity of the event and to adjust and guarantee the accommodation conditions to the best of their ability, implement and deal with the relevant measures of natural disasters for the competition and the personal safety of athletes, and vigorously publicize and develop relevant legal documents to warn all participants of the dangers and seriousness of doping.

Keywords: Winter Olympics; Racing; Risk

1. RESEARCH PURPOSE

Aims to have been produced in a successive game held at the various aspects of risk, and will carry on the comprehensive summary analysis of its risk classify, clearly identified risk event generated by the previous Olympics, according to these events will analysis the reasons and the event to a certain amount of risk classification, refined to evade the risk in 2022 at the Beijing Olympics, some Suggestions for our country to successfully host the winter games [1-3].

2. RESEARCH OBJECTS

This paper takes the major risks faced by previous Winter Olympics as the research object, identifies and divides the major risks through various research methods, finds out the existing problems and analyzes their impacts.

3. RESEARCH METHODS

3.1 Literature method

According to the purpose and content of this paper, the research results of CnKI, National Library and other relevant researches on the major risks faced by the Winter Olympic Games are obtained. With "major risks faced by the Winter Olympics" as the key word, 89 articles were consulted, and 6 key literatures were carefully read to further analyze the research results of major risks faced by the Winter Olympics, so as to provide reference information for this study.

3.2 Comparative study method

The major risks faced by previous Winter Olympics were identified and classified, and relevant data were statistically analyzed to obtain the corresponding theoretical basis. Comprehensive summary analysis and its risk classification comparative analysis, a clear conclusion of the previous winter Olympics risk events.

3.3 Inductive deduction

Through relevant data query and data extraction, the paper concludes the major risks and impacts of previous Olympic Games, extracts the inspiration of risk avoidance for 2022 Beijing Winter Olympic Games, and puts forward relevant suggestions to provide reference for China's successful hosting of winter Olympic Games.

3.4 Logical analysis

By summarizing and summarizing the major risks of previous Winter Olympics and their influences, the categories of relevant risks are clarified, and the relevant conclusions and suggestions are drawn to provide a reliable basis for this paper.

4. RESEARCH RESULTS

In the 23 Winter Olympic Games held from 1924 to 2018, the risk identification of the risky events collected from each Winter Olympic Games was carried out, which was mainly divided into pre-competition risk and in-competition risk. The pre-competition risk was divided into social and economic risk, political risk and media report risk. The risks during the competition can be divided into organizational risk, personal risk, disaster risk, property risk and doping risk [4-6].

4.1 Pre-Competition risk

4.1.1 Social and economic risks

The outbreak of global economic crisis or local economic crisis leads to the inaccuracy of pre-competition budget, which is not consistent with the actual needs; Sponsored goods, such as vehicles, clothing and communications facilities, are not available in time; The competition funds and personnel expenses exceed the budget; Sales risks of tickets, souvenirs, etc. For example, in the 1932 Winter Olympics in Lake Placid, THE United States, due to the tight budget, the chairman of the organizing committee, Dr. Godfrey Dewey, donated his own land to build a ski trail. Due to economic considerations, some developed countries in Europe did not attend or only sent a small number of athletes to participate in ice and snow sports. For example, there were only 12 athletes from Sweden and 7 athletes from Finland. The United States and Canada had the largest number of athletes, 150, or almost half of the total. But overall, this year was smaller than the last in terms of the number of participating countries and athletes.

And the cancellation of competition at the 2010 Winter Olympics in Vancouver, Canada, due to bad weather, resulting in the cancellation of tickets that had already been sold, costing organizers \$1.5 million. The Lake Placid Winter Olympics in the United States came at a time when the economic crisis was sweeping the world and people were not willing to participate, leading to a small number of participants and inadequate site preparation.

4.1.2 Political risk

Because of the number of countries involved, the games are complex, unpredictable and dangerous. Including acts of boycott, obstruction or sabotage by other national Olympic Committees; Terrorist activities, international conflicts and incidents of violence; Risks such as opposition speech and demonstrations. Boycotts by other national Olympic committees will have an impact on organizers. On the eve of the Winter Olympics in Sochi, terrorists committed two terrorist attacks within 24 hours by hook or by hook. "Russian Osama bin Laden" threatened to attack the Winter Olympics. In December 2013, two consecutive bombings attracted the most attention. The attack took place in the Volgograd region, which is just over 600 kilometers from Sochi, the site of the Winter Olympics. The terrorists were targeting the Games in an attempt to test the government's response to security and reaction ahead of the games. There have been anti-Olympic demonstrations and violence ahead of the Winter Olympics in Vancouver, leaving many injured. The risk of terrorist attacks, boycotts or obstructions will lead to the postponement or postponement of the Winter Olympic Games, which will have a great impact and destructive effect on the Winter Olympic Games. Demonstrations and opposition speeches have some influence on the Hosting of the Winter Olympics, but they are less destructive.

4.1.3 Media report risks

The Olympic Games is one of the most eye-catching media events in the sports field. Many media and other aspects play a significant role in the news coverage and attention of the Winter Olympic Games. The Internet connects the whole world, while the network media is like a double-edged sword, which has both advantages and disadvantages. No matter good news or bad news, it will spread explosively in a short time, which will have a great impact on the public opinion field. The response to crisis events will test the media's ability very much, especially in big media events like the Olympic Games, if the media events are not controlled to a certain extent, the negative marketing will also be extremely bad. A typical example is the 2018 PyeongChang Winter Olympics, which is the "limelight" of the Winter Olympics. There have been a lot of negative reports on the politics of the Two Koreas, the financing of the Winter Olympics, doping, nuclear safety in South Korea, referee decisions and even health. The impact of these reports on the PyeongChang Winter Olympics is extremely bad, and the risks are enormous.

4.2 Race time risk

4.2.1 Organizational risk

Organizational risk refers to a series of risks caused by the arrangement of the organizers for participants,

interviewers and spectators before the competition, the arrangement of the competition and training site and time, the unfavorable transportation, installation, debugging and command of the competition equipment, and the relevant cultural publicity and accommodation conditions during the competition.

Site construction, safety risk of site quality, rationality of venue design; The quality of the equipment and equipment on the court may cause errors of the players or referees in the competition or in the execution of the rules. When Squaw Valley submitted its bid to the International Olympic Committee, there were no competing sports facilities or venues at all. Bobsledding. Because only nine countries had signed up, the organizing committee decided that it was not worth the money to build a bobsledding arena, so it refused to build a special bobsledding track and announced that bobsledding would not be held. This was the first- and only-time bobsledding had been absent from the Winter Olympics. Organizers of the Vancouver Winter Olympics have admitted problems with the design of the course and changed the starting altitude after a bobsledder was killed in a vicious collision during training. The roof of an alpine skiing news center in Turin has collapsed and people have been evacuated, with no casualties reported. Two events were timed badly because of faulty timing equipment, with one Swedish woman delayed by 14 seconds at the starting point and two men starting too early. The risk of cultural activities refers to the risk events in the opening and closing ceremonies of the Winter Olympic Games for the purpose of promoting the culture of the domestic Winter Olympic Games. Several people were injured when an Olympics-themed party attended by 7,600 people collapsed during the Vancouver Winter Olympics. The Olympic rings were presented at the Opening ceremony of the Sochi Winter Olympics in a unique way, slowly transformed from snow and falling from the sky. But this key link has a major oolong, the scene has a snowflake failed to change, so there are the Olympic rings into the "four" scene; PyeongChang bocog's website in the world map as the carrier for a promotional campaign that, four missed to Japan, in Asia the map, where Japan's four blank, the Japanese side immediately and PyeongChang bocog has negotiation, get reply is the job of the bocog negligence, not only such, PyeongChang games official propaganda films, the Chinese audience familiar elements appear in succession, such as ink, printing, etc., the element by the net friend to have fun, suspected plagiarism for China's traditional culture.

In the run-up to the Games, some countries did not build Olympic villages to house athletes or provided poor accommodation, which is part of the risk. The fifth Winter Olympic Games in St. Moritz, Switzerland, did not have an Olympic village and participants lived in hotels close to the games, leading to the nickname "hotel Olympics." The hotel accommodations and services in Sochi have left delegations and the media disappointed, and preparations have been strongly questioned.

4.2.2 Natural disasters and personal safety risks

The winter Olympic Games are featured by high intensity and difficulty, and the risk of natural disaster accounts for

the highest proportion of the total risk. Since most of the winter Olympic Games are carried out outdoors, such as alpine skiing and cross-country skiing, the requirement on weather is particularly important. High temperatures will cause snow and ice to melt, and outdoor events will be greatly affected. Low temperatures or heavy snow or winds can disrupt or cancel games. During the 18km cross-country skiing at the 1932 Winter Olympics in Lake Placid, a sudden rise in temperatures caused the ice and snow to melt so quickly that only a thin layer of ice and snow remained on the ski slopes, causing many athletes to fall. A month before the start of the 2010 Winter Olympics in Vancouver, the temperature continued at 10°C, 3°C higher than the previous year, and there was more rain. Snowboarding was cancelled due to a temporary lack of snow and continuous rain, resulting in the cancellation of tickets and a loss of 1.5 million dollars. On the second day of the opening ceremony, the women's all-around alpine skiing event was postponed because of heavy snow, as was the men's downhill. Changes in the natural environment will lead to problems such as loose snow, thinning ice and water on the court, which will lead to more mistakes or lead to the risk of injury or even death during training or competition.

The risk of improper management of the venue by the organizer, such as improper management of spectator behavior, also poses personnel safety risks. At the Winter Olympics in Lake Placid, a sudden increase in temperatures caused many athletes to fall, leaving only a thin layer of snow and ice on the chutes as the weather changed. A spectator burst into the track during the Grenoble Games, forcing Austria's Jan Schlentz to brake abruptly. No one was injured, but his performance was affected. Six hours before the Vancouver Winter Olympics, bobsledders were killed in a vicious collision during a training session on the field due to poor management.

4.2.3 Risks of stimulants

The problem of doping has been hanging over the Olympics. At the Turin Olympics, Brazilian bobsledder Juan Manuel Santos was kicked out early after testing positive for drugs, while Russian biathlete Maria Peliva was the subject of the first doping incident at the Games and her silver medal was taken away. The subsequent doping scandal was even more dramatic, with 10 Austrian athletes tested and their compound raided by Italian police, who found plenty of evidence to help the investigation, even though they all tested positive. The Doping scandal in Sochi has brought the Russian Olympic Committee into a deep freeze. The systematic doping of a large number of athletes led to the excellent performance of the Russian team, which accounted for one third of the total medal count and ranked first in the medal table. The Russian Olympic Committee was severely punished by the IOC and condemned by other National Olympic Committees for the suspension of Russian athletes from sports events by

several international sports organizations.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 the conclusion

5.1.1 A series of pre-game risks are caused by insufficient pre-game economic preparations, reduced number of participants, international political boycotts and interference, and inadequate pre-game media reports.

5.1.2 Pre-competition venue related facilities, inadequate preparation, media publicity for the event, relatively poor accommodation and other related pre-competition organization issues, natural disasters on athletes' competition and personal safety issues, and doping incidents during the competition will all cause relevant risks at the time of the competition.

5.2 suggest

5.2.1 Enriching the ways of economic preparation to boost the economy of the event, reasonably and effectively dealing with the international political boycott and intervention, and perfecting the positive information reporting ways of the media before the event can effectively reduce the risks before the event.

5.2.2 Improve the site facilities preparation, strictly control the site facilities, quality and other issues. To improve the media's comprehensive publicity of the event and to adjust and guarantee the accommodation conditions to the best of their ability, implement and deal with the relevant measures of natural disasters for the competition and the personal safety of athletes, and vigorously publicize and develop relevant legal documents to warn all participants of the dangers and seriousness of doping.

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Investigation and Effect Evaluation on Management Mode of Table Tennis Club

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Abstract: Today, table tennis club relies on the avant-garde management mode, with first-class technical professionals, coupled with advanced entrepreneurial concept, has shown a strong momentum of development. The reason for its rapid expansion in a very short period of time is directly and closely related to its bold adoption of the chain management model. The extensive use of this model is bound to bring a great impact on the table tennis club industry, promote its reform, and ultimately provide a boost to the sustainable development of the local and even the national table tennis industry.

Keywords: Table Tennis; Club; Management Mode; Effect

1. ANALYSIS OF THE CURRENT MANAGEMENT MODE OF TABLE TENNIS CLUB

The application of the chain management model, so that their penetration can be greatly enhanced, the influence is further expanded, is the rapid growth of a main reason. According to the survey results, under the same conditions, enterprises adopting the chain operation mode have a stronger vitality than those adopting the single-store operation mode. For example, the failure rate in the first year is significantly lower. Because this kind of management mode is introduced and put into practice actively, it grows rapidly in a short time [1-3].

The application of chain management mode has extended its business scope to a great extent. Under normal conditions, table tennis clubs are limited by many factors such as capital, scale, reputation and so on. There are mainly two kinds of income channels, one is student training fee, the other is membership fee. Not only in the normal scope of business efforts, but also involved in the enterprise operation, such as selling all kinds of sports equipment, building a high-level coach team, and the establishment of cooperative relations with affiliated enterprises. Through the above measures, we are moving towards standardization, scale and high quality [4-7].

The application of chain operation mode saves a lot of development time. First of all, this mode has good publicity effect, saves considerable publicity investment for new branches, and speeds up the development process of new stores. Secondly, chain operation has established a relatively sound operation and management mode, which can improve the standardization of new store operation and avoid it being unsustainable due to lack of experience [8-10].

2. ADVANTAGES AND DISADVANTAGES OF TABLE TENNIS CLUB MANAGEMENT MODE

2.1 Advantage

First chance advantage. Throughout the sports and fitness market, chain management is not a new thing, but this model is seldom adopted by the table tennis club industry. This industry is also an indispensable part of the sports and fitness market. It is foreseeable that it will follow the development of The Times and embark on the journey of chain management in the near future. It is of great significance to the sustainable development of the company. Benefited from the early start, to seize the opportunity, in the table tennis industry has shown a good momentum of development.

Brand advantage. At the beginning of the establishment of the club, the most difficult thing is to establish the brand. When the brand is launched, the influence will naturally follow and the club will have a certain discourse power in the industry. For a club, when it sets up a quality brand, it will attract more people and save considerable publicity costs. Through their own unremitting efforts in the start of their own brand, in the local firm foothold.

Operation management advantages. If an enterprise wants to stand firm in the fierce industry competition, it is indispensable to have a sound operation and management model. In addition, it is also necessary to realize that it is a shortcut to copy the successful model. Based on their own and industry conditions, the introduction of the chain operation model, branch stores can get support from the main store, learn experience, especially in the operation and management model has a successful case for reference, which provides a guarantee for the smooth operation of their branches.

Talent advantage. The shortage of coaches will directly restrict the further development of the club. The coaches with strong professional ability have greater fluidity, while the ones with weak professional ability cannot meet the practical needs. According to the relevant investigation results, more than 80% of clubs are facing the shortage of coaches, which has formed a serious obstacle to the healthy development of the local industry. In the process of selecting and hiring coaches, strict checks are carried out, mainly for those who have obtained bachelor's degree in relevant majors, and they are also required to obtain national second-class athlete qualification. With the help of high-quality talents, they can have a foundation for rapid expansion. In addition, all stores under the company can share the human resources of the headquarters.

Price advantage. Club chain mode is introduced, the purchasing of all the equipment is in the hands of the headquarters, application is unified procurement mode, because the procurement scale is larger, so got high

guarantee on quality, in addition, also grasp the initiative in the negotiation on, as a result, the club showed obvious advantages in the field of equipment sales.

2.2 Less than

After sorting out the current table tennis club industry, it is found that chain management mode is still rare. In other words, it mainly relies on self-exploration, and there are not many experiences for reference. Therefore, various deficiencies will inevitably be exposed during the management period.

Chain management mode is still to be improved; it is still unable to achieve the full market occupation.

Because the operation time is not long, there are still two outstanding problems pending, one is the shortage of coaches, the other is the shortage of sales personnel. These are two common problems in the industry.

3. STRATEGIES FOR IMPROVING THE CHAIN MANAGEMENT MODE OF TABLE TENNIS CLUB

3.1 Attach importance to brand effect

The final competition between brands is largely emotional. Sensibility covers two points: first, internal sensibility, that is, members value and trust the brand, or even regard it as confidant, and are willing to devote their feelings to the brand; Secondly, external sensibility means that members will use the brand as a symbol to show some aspects of themselves to people around them, such as status, taste and accomplishment. Therefore, in the process of brand building, the club should grasp three points in particular. First of all, before establishing the brand, we must accurately grasp the emotional needs of members, improve the brand design from a comprehensive perspective, and build it into the kind of brand that the public really needs. Secondly, if the brand is well received, the next task is to copy the successful model and further promote it, so as to grab a larger market share in a short time. Thirdly, carefully collect and analyze the demand of franchising shops, to ensure that it can get good benefits, create a good situation as long as joining can be successful, so as to lay the foundation for the sustainable development of the brand.

3.2 Strengthen personnel training

For an enterprise, talent is of great importance, which is related to its current survival and long-term development. Attention should be paid to the professional quality of talents, which largely determines the speed of enterprise development. For the chain table tennis clubs, if they want to rapidly expand their scale and seize more market share, they should carry out the work of talent training and cultivate high-level internal and external talents. The so-called internal talents refer to administrators and coaches, while the external talents refer to sales personnel. Take administrators and coaches as objects and conduct systematic training on their professional quality to promote the improvement of their work level. At the same time should also be targeted at sales personnel, timely and effectively supplement nutrition, arrange more training, organize more practice, enrich their sales experience, improve their sales ability. In the process of management, the table tennis club should attach great importance to its own talent training work and truly implement the internal and external talent training work in place. When choosing

training methods, they should be diversified, including group training, lecture training and practical training. In terms of training content, they should also be comprehensive, covering coaches, sales personnel, logistics and other aspects effectively.

3.3 Take service as the core and strictly control the joining of clubs

In essence, table tennis clubs can be classified into the category of service industry, whose survival and development are based on the quality of service. High-quality service can generate strong attraction for members and create excellent brand image. Therefore, it is necessary for table tennis club to make full efforts in service, protect members' rights and interests, and cultivate and enhance brand reputation. First, the club needs to play a good role of the headquarters, around the core of the quality of service, design and launch a set of perfect evaluation of the franchise system, to the prospective franchisees for strict assessment, only meet the standards, can cooperate. Second, we will do a good job in market supervision. Headquarters can take regular interview method, appoint the related staff to join the club in market research, understand the members in the service experience related to whether there is a problem, after combing and induction on these problems, timely, true and accurate feedback to headquarters, to interfere with the brand development of targeted optimization, if aware about joining the club can't consistent with headquarters in concept, should be taken to give up at this time, but, so operation, to establish high-quality brand. In the process of investigating franchisees, the headquarters should strictly implement the established supporting standards, will really put the work in place, everything to quality. One-sided emphasis on the number of join, and brand maintenance in disregard of the practice, is not desirable, this will reduce their public praise, unable to become increasingly white-hot industry competition in a firm foothold. Only by introducing high-quality service, centering on members and providing intimate service, can the club achieve long-term development.

3.4 Bold innovation and personalized operation

The importance of innovation is self-evident, is the soul of national development, but also the power of enterprise growth, table tennis club to achieve sustainable development, we must adhere to the road of continuous innovation, highlight their own personality. In the aspect of innovation, the table tennis club has always attached great importance to it, and thus achieved good results. Its innovation is mainly reflected in the following aspects: first, innovation in management mode. When the vast majority of clubs are applying the single-store model, the proactive introduction of the chain model, with its help, the scale has been significantly expanded. Second, innovation in services. On the basis of the systematic investigation of member demand, and based on the reference of the after-sales service system commonly used in the home appliance industry, the member feedback system was successfully launched to understand the member satisfaction

At the same time, collect their suggestions and transmit them to headquarters through effective channels, ultimately ensuring that problems can be continuously

identified and progress made in a dynamic manner. It is because of the bold innovation, just have the opportunity to stand out in the industry, start the brand. For table tennis clubs, if they want to achieve rapid development, they must stick to the path of innovation, define and highlight their personalities, and take a path of personalized management.

3.5 Strengthen the emergency response ability

The occurrence of brand accidents cannot be completely eradicated. When encountering brand accidents, some enterprises will mismanage, cause serious problems and even declare bankruptcy. If a club is to be managed for a long time, it needs to be cautious, steady and equipped with the ability to deal with all kinds of unexpected stories. During the management period, in case of brand accidents, the reasons should be clarified as soon as possible from the perspective of effective maintenance of brand image, and then effective explanations should be made to the majority of members in a timely manner to maintain the brand reputation and avoid the loss of a large number of members. At the same time, the franchisee shall be responsible for the corresponding processing, not loud and small, let members disappointed, for the circumstances are not serious, apology attitude is ok, according to the relevant agreement on the contract to remove the franchise relationship, for the relatively serious circumstances, file a lawsuit, according to the law to investigate its responsibility.

3.6 Give full consideration to the long-term and sustainable nature of development

When evaluating the advantages and disadvantages of things, we should not be limited to the present, but should be based on the long term. Table tennis club construction is a systematic project, which cannot be done overnight. In the short term, it may bring relatively good economic benefits, but it is unlikely to produce ideal social benefits, because social benefits involve a process of continuous accumulation. Only get a batch of members of the continuous praise, can slowly form an ideal social benefit. For table tennis clubs, only by obtaining certain economic benefits can they continue to operate and lay the foundation for producing ideal social benefits. As the founder of the chain club, we should first establish the faith of running for a long time, and at the same time make a long-term plan, so as to lay a solid foundation for the long-term development of the club.

4. CONCLUSION

Chain management can produce a strong driving effect and help local table tennis clubs to develop in a better direction. From the overall management of local table tennis clubs, it can be seen that the regions with more ideal development will exert certain driving effect on the regions with less development. This kind of driven growth is a healthy growth. With the promotion effect generated by the chain, it can be predicted that it will not be long before the table tennis clubs will achieve greater breakthroughs in both quantity and quality. Chain management to plan the local club industry order. Chain management is an emerging management mode born in the market economy environment. Since its birth, it has shown strong vitality and obtained rapid development, which indicates that it has

significant advantages in the market economy environment. In this mode, on the one hand, table tennis club's actual registration number has decreased, on the other hand increased the number of the same club, as a result, bringing great government daily management work, not only that, whether charge standard, and the management pattern, have been unified, improve the market transparency, provides a boost for the orderly development of the market. Promote the league between the different clubs in the territory. In the form of chain to manage the club's main advantage is that, in the branches in different areas of the club to organize regular game, through the game play and improve their skills, this kind of communication due to the participants is more, can produce scale effect, when there is a demand of the ball friend in quantity to a certain extent, this form can also introduce the league. Such leagues may be for members as well as for students, either for members or for students, to improve their abilities. Not only that, but also can have an impact on the surrounding people, prompting some people to like and join table tennis. In the process of organizing the league, the horizontal implementation should be carried out first, that is, relevant exchanges should be carried out within each city, and then the vertical competition should be organized, that is, the so-called cross-city competition. The horizontal and horizontal, coordinated and orderly table tennis league can produce great radiation power, make more people like this sport, and then participate in it, promote the further development of this industry, and finally make a certain contribution to the economy.

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How to Manage the Floating Population of Urban Minorities Effectively: A Case Study of Zhejiang Province

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Abstract: The management of floating population of urban minority is the combination point of floating population management and urban ethnic work. The work is of great significance which involves the United Front Work Department, Political and Legal Affairs Commission, Public Security Bureau and many other departments. Under the current situation, the social integration of China's urban minority floating population is faced with such problems as cultural adaptation, employment guidance and rights protection. At the same time, the government management is faced with such problems as lack of professional talents, division management of departments, localization management and rigidity of national public services. To innovate the management of urban minority floating population, it is necessary to strengthen the construction of professional team, set up comprehensive government management organization, break the pattern of localization management and promote the equalization of ethnic public services.

Keywords: Urban Minority Floating Population; Protection of Rights and Interests; Public Services; Innovation

1. INTRODUCTION

The floating population of urban minority belongs to the category of urban floating population, which is distinguished from the floating population of Han nationality due to the identity of ethnic minority, including social management problems caused by different regional culture, belief, custom, psychological identity, ethnic communication and other dimensions. The floating population of urban minority is different from the concept of urban minority population because it does not have urban household registration and is engaged in various social, economic and cultural activities in the city. At present, the academic community mainly carries out relevant researches from the perspectives of pluralism theory, human resource theory and assimilation theory, etc. At the same time, its viewpoints mainly strive for benefits for the differentiated treatment of this group. However, this kind of research usually focuses on the economic antagonism and cultural conflict of ethnic minorities, while ignores the marginalization of their political life and social identity. In addition, there is a lack of relevant research in the identification of ethnic minorities, differences in institutional patterns and analysis of social structure.

In China, the research on the social structure of various

ethnic groups embedded in each other mainly focuses on the management of urban floating population and urban ethnic work. The research areas are mainly large and medium-sized cities with developed economies meanwhile. The first angle is closely related to macro policies and floating population management. It mainly takes China's urban floating population as the research object, conducts in-depth and thorough analysis of the problems in urban floating population management, and then studies the methods and approaches to solve the problems on this basis. So as to provide suggestions for building a harmonious socialist society. [1] The second perspective is closely related to ethnic theories and policies as well as ethnic relations. This paper discusses the theory and practice of China's urban ethnic work from three aspects: the development course of China's urban ethnic work, the theoretical analysis of ethnic issues and the specific content of ethnic work, and probes into the protection of the legitimate rights and interests of urban floating ethnic minorities. Urban ethnic problems such as poverty, lack of education and difficulty in social integration of the floating population of urban ethnic minorities have always been the focus of urban ethnic work. The historical stage and occupational characteristics of the population mobility of ethnic minorities and the eastward migration of ethnic minority women will also be the main research direction of urban ethnic work in the future. The trend of ethnic minority population flow, occupational characteristics and problems in urban management are also the main responsibilities of government management. It is necessary to discuss the innovative urban ethnic work from the angle of rule of law and social security.[2]

This research mainly takes Zhejiang province as an example to carry out empirical investigation. With the economic and social development, a large number of ethnic floating population in Zhejiang has more than 1.65 million. In this study, through to the Public Security Bureau, United Front Work Department and other departments to get related information. Selecting typical settlements in the fieldwork to find out the geographical distribution and age distribution to understand the social integration degree. Through the questionnaire survey and the related data statistics way to display meanwhile. In addition, this study will also analyze the government management behavior, staff situation and relevant policies to find out the problems of minority floating population, such as employment guidance, children education,

religious belief, social security and public services, so as to put forward relevant solutions and optimize the city [3].

2. BASIC SITUATION OF FLOATING POPULATION OF URBAN MINORITY IN ZHEJIANG PROVINCE

"Land resettlement" is a national characteristic of the Chinese people. Land is a necessity to satisfy the living elements. The rural characteristics of the traditional Chinese social pattern make the common people closely connected with the land. However, in the context of rapid economic and social development, a variety of development factors drive the city to become the center of population concentration. The mass population movement in China has changed from the traditional influence of war, disaster and politics to the driving force of modern development factors. Since the founding of The People's Republic of China, the large-scale urban population mobility in Zhejiang province has undergone three stages: the planned economy period, the initial stage of reform and opening up and the present stage. The floating population of urban ethnic minorities also presents an overall trend of rural-to-urban and west-to-eastern mobility.

2.1 The Historical Context of Urban Floating Population in Zhejiang Province

The large-scale population movement in China's history is all associated with war, disaster, politics and other factors. After the founding of new China, driven by development factors, population mobility in Zhejiang province can be roughly divided into two types: policy-oriented flow and means-driven flow. From the point of flow cycle node, it can be divided into seasonal flow, daily flow and irregular flow. These floating forms have different forms in different historical periods, and the permanent changes in the place of household registration or residence as the identification of floating population is the main reference standard for current research.

2.1.1 Pre-reform and Opening up (1949-1978)

After the founding of new China to the reform and opening up period, China experienced from planned economy to socialist market economy transformation. During this historical period, population mobility in Zhejiang province was mainly policy-oriented. The large-scale mobility mainly occurred during the Great Leap Forward movement from 1958 to 1962 and the movement of educated youth from 1968 to 1980. In the period of great Leap Forward, the population mobility had a short periodicity, while the movement of educated youth to the countryside had a longer periodicity, and the population mobility had a promoting effect on the development of local production. At the same time, due to historical reasons, permanent changes have taken place in the places of residence of some floating population, transforming from population mobility to population migration.

2.1.2 The Beginning of Reform and Opening Up (1984-1992)

In the early stage of reform and opening up, population mobility in Zhejiang province was relatively slow, on the one hand, due to the restrictive policies of the government, and on the other hand, due to the lack of driving force of economic development. Until the mid-1980s, the

urbanization construction in Zhejiang province was accelerated, and the driving force of livelihood accelerated the speed of migrant workers entering cities. However, due to the government restrictions on the floating population in the industry, regulations are not allowed to enter state-owned enterprises and institutions, coupled with the strict management of urban household registration, the floating population mainly engaged in construction, catering, sanitation, transportation and other low-end jobs. In this historical period, population mobility in Zhejiang province was characterized by individuality, singleness, temporality, instability and randomness of employment. The government management was not sound, let alone targeted policies for ethnic minorities.

2.1.3 After the Southern Tour Speech (1992-present)

With the publication of Comrade Deng Xiaoping's Southern Tour speech in 1992, China's socialist market economic system was gradually established and improved, the demand for labor force in economic and social development was increasing, and the government gradually eased the trade restrictions on floating population. The population flow in Zhejiang province is mainly stable and mainstream to Hangzhou and other big cities. The stability of the occupation and the expanding scope of the industry. With the break of individual single pattern, the population mobility of family size becomes normal. The trend towards youth has been strengthened, with young people pouring from rural areas into urban areas. In this process, the private enterprises and foreign-funded enterprises led by Wenzhou bear the main floating population, while some state-owned enterprises and institutions bear a small number of them, while others are mainly private or part-time workers.

2.2 The Floating Population of Urban Ethnic Minorities in Zhejiang Province

Zhejiang province is the eastern economic developed province, is also the minority scattered mixed province. Since the reform and opening up, the floating population of ethnic minorities in Zhejiang province has increased greatly, and the urban ethnic work is also facing new and more difficult challenges. A general survey of the floating population of ethnic minorities in prefecture-level cities in Zhejiang province shows the characteristics of fast flow rate, wide distribution and stable source.

2.2.1 The Number of Floating Population of Ethnic Minorities

According to the sixth census, the permanent population of ethnic minorities in Zhejiang province is 1.215 million, accounting for 2.2 percent of the province's total population, with a registered population of 456,000. She is a hereditary minority in Zhejiang province, with a population of 166,000, accounting for 0.3% of the province's total population. Jingning She Autonomous County has 18 she townships and 443 ethnic minority administrative villages (437 She villages and 6 Hui villages). In addition, according to the statistics of relevant departments, by the end of 2015, there were 2.2338 million floating population of ethnic minorities in the province, and the population during the 12th Five-Year Plan period increased by 98% compared with the 11th

Five-year Plan period. By the end of 2017, there were 2.417 million floating ethnic minorities in the province,

including 55 ethnic minorities.

Table 1: Population and composition distribution of ethnic minorities in prefecture-level cities of Zhejiang Province [4]

	Hangzhou	Ningbo	Wenzhou	Huzhou	Jiaxing	Shaoxing	Jinhua	Quzhou	Zhoushan	Taizhou	Lishui	Total
Ethnic composition	54	54	50	46	53		55	44	43	45	47	55
Number(k)	276	318	583	20	181	16	46	37	24	47	107	1655

2.2.2 The Social Development of Ethnic Minorities in Zhejiang Province

For urban ethnic work and development of the ethnic minorities, in 2015, the Zhejiang province issued "Several opinions of the CPC Zhejiang Provincial Committee and Zhejiang Provincial People's Government on further strengthening ethnic work under the new situation". In 2017, "The 13th five-year plan for the development of ethnic minorities in Zhejiang Province" was formulated, and the ecological map and big data platform of ethnic minorities in Zhejiang Province were carefully studied and deployed. Office of provincial people's government in 2018 issued by the "on further strengthening and improving the urban ethnic work opinion", the Provincial Ethnic and Religious Committee introduced "Implemented in Zhejiang province" pomegranate seed project "career guidance" to promote national unity progress, advancing with Zhejiang characteristics of micro-organization, micro window, micro hotline, micro platform as the main content of the construction of "four micro" urban ethnic work. At present, 461 "four micro" carriers have been established in the province to provide more humanized and refined urban services for the floating minority population.[5]

2.2.3 Frequency of Population Mobility of Ethnic Minorities in Zhejiang Province

The floating population of ethnic minorities in all prefecture-level cities in Zhejiang province shows the characteristics of accelerated floating frequency and wide sources, especially in Wenzhou, Ningbo and Hangzhou, with the highest floating frequency. Flow frequency is related to urban economic scale, historical and cultural characteristics and soft power of urban service. In terms of flow direction, the flow of ethnic minority population in Zhejiang province mainly includes the flow of rural ethnic minorities (such as She ethnic minority group) to cities and the flow of ethnic minority population outside the province (such as the southwest, northwest and other ethnic minority areas) to cities. Generally, there are four types of flow, namely, ordinary work type, characteristic business type, blind flow type, remote development type and labor export type. In addition, cities near ethnic autonomous counties and ethnic townships are more likely to have high frequency of population mobility.

3. TYPES AND CHARACTERISTICS OF FLOATING POPULATION OF ETHNIC MINORITIES IN ZHEJIANG PROVINCE

The types of floating population of ethnic minorities in Zhejiang province include ordinary type of work, characteristic business type, blind flow type, remote development type and labor export type, among which ordinary type of work and characteristic type of business are the main types of floating population of ethnic

minorities in Zhejiang Province. Most of these floating population come from the She ethnic group in rural areas of the province and miao, Zhuang and Buyi ethnic groups in south-central and south-western China. Other minority groups are Hui, Uygur, Salar and Dongxiang ethnic groups who believe in Islam in northwest China, while Manchu and Korean ethnic groups in northeast China are relatively small. These ethnic groups are mainly characterized by ethnic group cohesion and group employment, youth and youth, low cultural quality and obvious differentiation of employment modes among different ethnic groups.[6]

3.1 Ordinary Work Type: Large in Quantity and Labor Intensive

The main characteristics of the floating population of ordinary migrant minorities are that most of them are young adults with low educational background and strong adaptability. In this kind of floating population, the same ethnic group living relatively concentrated, engaged in the industry is more concentrated. Taking she, Miao, Zhuang and Buyi as examples, they mainly belong to this type, and their sources are mainly ethnic regions in southwest and south China, with a large number of people entering factories or private enterprises. Due to the lack of arable land in their hometown or the backward development of private economy, a large number of surplus labor force is passively exported to Hangzhou, Ningbo, Shaoxing and other economically developed areas. They are also engaged in construction sites with manual labor as the main industry and labor-intensive enterprises with less operation difficulty. In industrial clusters, labor-intensive industries, mainly in construction, textile and chemical industry, have attracted a large number of floating populations of She, Miao, Zhuang, Buyi and other ethnic minorities. Such groups usually join in groups and form groups such as fellow villagers' associations to introduce each other at work, thus forming a pattern of resource sharing within the same ethnic group. Other part of ordinary work type population is mainly engaged in the work of service nature such as waiter, nanny. Take the floating population of Yi nationality in Zhejiang province as an example. Most of them come from Liangshan Prefecture of Sichuan province and work as masseurs, physiotherapists, waiters and so on, forming the industrial operation. The floating population of ordinary migrant workers from minority ethnic groups is usually difficult to identify their ethnic identity, which is the same as the Han nationality in the daily environment. They are not strong in revealing their ethnic identity, and usually take a swallowing attitude when they encounter slight ethnic discrimination, and are not easy to express to a certain extent. This group has a high degree of social demand and acceptance due to the physical work that the urban

population does not want to do.

3.2 Characteristic Business Type: National Identity Is Prominent and Boundary Is Strong

The floating population of ethnic minorities with business characteristics mainly comes from the northwest, southwest and other border areas. The ethnic composition is dominated by Hui, Uyghur, Tibetan and Qiang. Among them, the Hui people in Zhejiang province are mostly from Gansu, Ningxia and Qinghai. The Hui people in Hualong County, Xunhua County, Qinghai province and Linxia Hui Autonomous Prefecture, Gansu Province are mainly engaged in Lanzhou noodle business, while the Hui people in Ningxia are mainly engaged in cart transport and fur trade. The Uyghurs in Zhejiang province, usually from Xinjiang, are mainly engaged in mutton kebabs and selling raisins and cut cakes. The Tibetan and Qiang people are mainly from Tibet, Ganzi and Aba Tibetan Autonomous Prefecture in Sichuan. Most of them are engaged in medicine and Tibetan knives. This kind of group has strong business characteristics and distinctive ethnic characteristics in a certain region. Meanwhile, such as the Hui nationality and The Uyghur, such food characteristics are obvious, which is easy to cause disputes due to misunderstanding. In addition, most of these groups have strong business mobility, and Lanzhou noodle businesses generally have fixed rental fronts, which are registered and tested by the Food regulatory Bureau. Uyghur and Tibetan, for example, roast mutton skewers, sell sliced raisin cakes, and sell Tibetan knife or medicine. Their stalls are highly mobile, fake goods are often sold, and product quality is not effectively monitored, so they are easy to come into contact with urban management departments, and their ethnic identity is stigmatized. In terms of social management, this group is more difficult than ordinary workers, and communication and coordination are more difficult due to the differences of belief and culture, as well as the low level of education or Chinese.

3.3 Blind Flow Type: Liquidity Is Strong and Regulation Is Difficult

Among the urban floating population, the blind floating population occupies a small proportion. In Zhejiang province, the floating population of blind ethnic minorities is relatively small, mainly teenagers. This group is younger in age and less educated, and generally has no professional skills. These groups often make a living in groups and occasionally engage in low-end manual labor, with strong mobility and great difficulty in social supervision. Some of them even cheat, kidnap, steal and other illegal behaviors, which greatly damage the overall expression of the minority people. Some of them have been captured and repatriated for many times, and some of them still refuse to change despite repeated teaching. This is the biggest difficulty in managing the floating population of the urban minority. In the process of doing the urban ethnic work well, it is a necessary measure to maintain the social security and stability to control the blind floating groups. Local governments, Human Resources and Social Security bureaus, Employment bureaus and other relevant departments carry out special

arrangements for this group to make efforts in employment training and value guidance, so as to prevent this type of floating minority population from going astray and prevent factors of social instability.[7]

3.4 Remote Development Type and Labor Export Type: Industry Is Obvious and Easy to Manage

This type of population is mainly engaged in land development and labor service export, with fixed sources, strong organization and planning. Such groups usually come from the She township in Zhejiang province and their counterpart areas. The She township people are mainly engaged in the development and operation of rural tourism, characteristic farms and farmhouse, while the local people are mainly assisted by the export of labor services, which are generally easy to manage.

4. PROBLEMS EXISTING IN THE MANAGEMENT OF FLOATING POPULATION OF ETHNIC MINORITIES IN ZHEJIANG PROVINCE

The floating population of ethnic minorities in Zhejiang province comes from a complex source, has a wide range of employment, and is different in age level, education level and psychological adaptation, all of which greatly affect the acculturation and social integration of this group. The social integration of the floating population of ethnic minorities not only requires the active adaptation of the floating population of ethnic minorities, but also requires the relevant departments of the Party committee and the government to pay more attention, actively improve the management system, enrich the management methods, and make contributions to the urban ethnic work and the promotion of ethnic unity.

4.1 The Social Integration of The Floating Minority Population in Zhejiang Province

When the floating population of ethnic minorities leave their hometown and enter a new and strange city, they will often encounter problems such as culture, employment and rights and interests protection, which involve the adjustment of psychological gap, the supply of means of production and the protection of legitimate rights and interests.

4.1.1 The Question of Cultural Belief

China's ethnic minorities generally have their own folk beliefs and customs. The ethnic minorities in southwest China, Central South China and Northeast China mainly believe in primitive and folk beliefs, while the Hui, Uyghur, Salar, Dongxiang and other ethnic minorities in northwest China mostly believe in Islam. In terms of customs, she and other ethnic groups will celebrate the third day of the third month as a grand festival, while Hui and Uyghur will worship eid al-Fitr and Eid al-Adha. In terms of eating habits, people who believe in Islam do not eat pork, and the Yi and Manchu people do not eat dog meat. After entering the city, the customs and habits of ethnic minorities lack the overall cultural atmosphere and environment. As time passes, it is easy to have a sense of cultural loss and unadapt ability. In addition, southwest, south, northwest minority areas usually do not have a high level of modernization, population cultural level is low, after entering the modern city, the modern culture on the adaptation of existing psychological gap and mood swings

with the surrounding Han, the superposition of the difference of life habit could be aggravated by ethnic floating population into social sense of belonging and degrees.

4.1.2 The Question of Employment Guidance

The floating population of ethnic minorities in Zhejiang province generally has a low level of education and few skills, and tends to be engaged in ordinary labor type, characteristic type of business and blind flow type. For ordinary migrant minority workers engaged in low-end manual labor, how to find a suitable job at the beginning of entering the city, as soon as possible access to material life is the primary problem. Construction sites, porters and labor-intensive enterprises operated by semi-mechanized and semi-manual labor admittedly accommodate a large number of floating minority population, but this type of employment is less stable and more alternative, easily leading to an increase in unemployment of this group. In this respect, the improvement of employment ability and the expansion of employment channels are the necessary means to guide the floating minority population to integrate into the society. Not only that, we should increase the intensity of social employment training, and gradually transform them from low-end industries to "multi-legged walking". Only in this way can the floating minority population face the environment of fierce market competition in a targeted way, so as to ensure their social integration to the greatest extent.

4.1.3 The Protection of Rights and Interests

The legitimate rights and interests of the floating population of ethnic minorities in cities include not only the rights and interests of labor security, but also the rights and interests of basic medical security and the education security of their children. Led by the provincial government, Zhejiang province has held several urban ethnic work symposiums, earnestly implemented the relevant provisions of the State Council's implementation policies, paid attention to giving play to the role of communities and grass-roots mass organizations, enhanced mutual understanding and respect, kept close neighborhood relations, and enhanced the cohesion among ethnic groups. We will protect the legitimate rights and interests of ethnic minorities by implementing preferential policies for them. But at the practical level, the full coverage of employment and medical security still needs to be improved. For the floating population of ethnic minorities engaged in heavy manual labor (construction sites, etc.), odd jobs and non-signing labor contracts exist in a large range. A large proportion of workers in private enterprises still have problems such as inadequate medical insurance and incomplete insurance procedures, which are easy to cause problems of legitimate labor rights and medical rights protection. In terms of children's enrollment, the household registration system has not been liberalized to a certain extent, and the safeguard measures for children of migrant workers from ethnic minorities and their ethnic customs and culture after enrollment still need to be strengthened.

4.2 The Problem of Government Management of Floating Population of Minority Nationalities in Zhejiang Province

As the administrator of the public environment, government departments play a leading role in the management of the floating population of ethnic minorities. However, in practical work, government departments and staff often fall into a fragmented way of thinking. In the process of dealing with urban ethnic affairs, they separate the floating population of ethnic minorities from their cultural belief and psychological identity, resulting in a series of problems among ethnic groups, urban and rural areas, and among different qualities.

4.2.1 The Shortage of Government Professionals

The departments engaged in minority floating population management lack professional cadres who are familiar with ethnic theories, policies and folk culture. Some cadres are enthusiastic in their work, but lack effective professional training, which is limited to the understanding of the work of ethnic minorities, which is difficult to solve the cultural, psychological and cognitive barriers of ethnic minority compatriots after they enter the cities.[8]

4.2.2 The Contradiction of Division Management

Division of departments is the main reason for the difficulty in managing the floating population of ethnic minorities. The work of floating population of ethnic minorities in Zhejiang province is under the leadership of the leading group of floating population Management and service of Zhejiang province, led by the public security organ. However, when it comes to the specific affairs of ethnic minorities, it is difficult for all departments to share resources and take into account the overall planning, resulting in problems such as unclear responsibilities, prevarication-shifting and bicker, etc., which reduce the utilization rate of public resources.

4.2.3 The Lag of Urban Territorial Management

China has long implemented the localization management system, stipulating that local governments have the right and responsibility to manage the registered population. Under the existing household registration system, the management mode is still used by the public security department of Zhejiang province led by top-down against traditional way, difficult to "cure" and "guide", defined the government and the water government linkage frequency problem is low, it is difficult to effectively solve the ethnic floating population service and security problem of less.

4.2.4 The Rigidity of National Public Services

Under the traditional control thinking, defined the government's main stresses the social public security work, and to a certain extent ignored minority floating population employment, health care, education, housing, rights, psychological demand diversity, lead to the humanistic care of ethnic floating population and the lack of fine management, public service are out of place.

5. COUNTERMEASURES TO IMPROVE THE MANAGEMENT OF FLOATING POPULATION OF URBAN MINORITY

The management of the floating population of ethnic minorities, as the link between the floating population and urban ethnic work, is not a single problem of population transfer, but more related to ethnic issues, urban

management issues and even national political issues. Innovating urban minority floating population management is not only an exploration of joint actions of various government departments, but also an effective way to improve China's public service capacity and realize the modernization of social governance.

5.1 Build Professional Teams and Promote the Specialization and Refinement of Urban Ethnic Work

United Front Work departments at all levels should be given full play to their overall planning role, more efforts should be made to train the professional knowledge of cadres in functional departments, and courses on "ethnic theory and Religious theory in the United Front" should be offered to improve the professional level of cadres in relevant functional departments. In particular, according to the needs of the floating population of ethnic minorities, we should cultivate or introduce professional talents in a timely manner, enhance the humanistic care and management service quality of the floating population of ethnic minorities, and improve the degree of integration and sense of gain of the floating population of ethnic minorities entering the city.

5.2 Promote Information Sharing and Promote Cooperation between Governments at All Levels and Relevant Departments

On the basis of the refinement of the residence registration work of the floating population of ethnic minorities, the following steps should be taken: first, strengthen the work of the municipal leading group for the management and service of the floating population, refine the work functions, and set up full-time personnel to take charge of the daily affairs of the floating population of ethnic minorities. The second is to adjust the management service system for the floating population of ethnic minorities. The United Front department and the public security organ shall be jointly responsible for the adjustment, so as to strengthen the work connection, resource integration and information sharing between the new residents' Office and the People's Settlement Office. Third, regular joint meetings on urban ethnic work should be held to straighten out the working mechanism and clarify work responsibilities, forming a working pattern led by the United Front Work Department and the public security organs, and coordinated by the departments of politics and law, civil affairs, public health, industry and commerce, civil affairs, civil affairs, civil affairs, civil affairs, civil affairs, law enforcement and other departments.

5.3 Break Territorial Management and Promote Cross-border Linkage Management between Destination and Destination

As a destination for population inflow, Zhejiang province needs to coordinate with the population outflow areas in the central and western regions to establish a corresponding coordination mechanism for ethnic and religious work and form a working network of joint construction and sharing. First, a mechanism for the education and service management of the floating population of ethnic minorities should be established to jointly provide training in language exchange, policies and

regulations, technical skills and other aspects for the floating population of ethnic minorities in the places of outflow and the places of outflow. Second, build a network government service platform, establish an information resource sharing system, and realize data sharing and complementation. Third, establish a learning liaison mechanism, strengthen mutual learning and investigation, mutual discussion and reference, and jointly promote the service innovation of the floating population of ethnic minorities.

5.4 Strengthening Multi-party Cooperation and Promoting Full Coverage of High-quality Public Services

The floating population of ethnic minorities is an easy group to be neglected, and it needs the concerted efforts of all parties to provide effective public services. Relevant social institutions and departments should provide timely behavioral intervention and emotional counseling to reduce the group's sense of national cultural deprivation. The employment and labor security departments should strengthen their skills training and rule of law education according to ethnic characteristics. Civil affairs and other departments to do a good job in citizenization services. The Ministry of Health and other units to provide medical and health care, family planning and other services. The education department guarantees the school-age education of minority children. Law enforcement and other departments have done a good job in regulating the operation of business operators with special features, strengthened publicity and education of mobile stallholders, strengthened supervision over food safety, and resolutely cracked down on ACTS of violating laws and discipline and selling fake and low-quality products. In addition, in ethnic communities, education on ethnic unity should be carried out on a regular basis to create a good spiritual outlook for ethnic minorities.

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Research on the Governance effectiveness of College Physical Education

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Abstract: The concept of the school sports injury accident, in 2002 promulgated by Ministry of Education student injury accident treatment method gives a clear explanation: the school or school sports injury accident is the area of management responsibility, and school staff to participate in the organization or teaching activities, students of personal injury happened during this period. In order to minimize the risk of injury, teachers should actively keep track of students' physical conditions, conduct site equipment inspection before class, actively prepare lessons, enrich concepts and teaching methods, and conscientiously implement various preventive measures. Students learn to protect themselves, improve the ability to deal with injury accidents, actively participate in school safety education, actively buy school health insurance, fully do warm-up running before class and relax after class. Schools should regularly arrange safety education and training to improve the self-prevention awareness of school teachers and students.

Keywords: College Sports; Governance Effectiveness; Preventive Measure

1. INTRODUCTION

As for the definition of sports injury accident, scholars hold their own views, but there are some commonalities. It mainly includes the following aspects: (1) the place where the accident happened is the area where the school has management responsibility; (2) The occurrence process is in teaching activities, sports competitions or sports training after class. (3) The injured are college students. To sum up, in this study, the author defines the school sports injury accidents as the physical injury accidents caused by students themselves or others in physical education, after-school physical exercise, extracurricular physical activities and sports competitions.

2. RESEARCH ON THE DEFINITION OF RELATED CONCEPTS OF GOVERNANCE

From the perspective of the subject of governance, governance beyond a single subject is a complex network of public and private subjects from different fields and composed of forces and movements participating in governance. On the basis of governance, the state still plays a major role, but it is not the only, exclusive authority that needs to be cooperated with other actors; From the way of governance, there are both formal enforcement measures and non-governmental consultation measures. From the perspective of the purpose of governance, all parties constantly participate in, negotiate and resolve conflicts to meet the interests of all parties and realize the maximum interests of the society.

To sum up, national governance is an activity with common goals and guiding support. In the process of management, there will be multiple governance bodies. The government is no longer the only one, and the force of state compulsion is no longer the main measure, and government organizations and Non-Governmental organizations will become the backbone. Sports governance is a process in which all kinds of sports organizations, individual citizens and interest groups jointly participate in sports public affairs with specific institutional arrangements in order to achieve a certain national sports development goal. He thinks that sports management and sports management are two different concepts, which are inclusive and subordinate to sports management. Sports governance emphasizes more on the diversity of participating subjects, while sports management is more of a unidirectional coercive execution of a single subject.

3. RESEARCH ON TYPES OF SCHOOL SPORTS INJURY ACCIDENTS

According to different perspectives and scholars' own research needs, the classification of accident injury types also expresses their opinions. According to the time and causes of the accident, zou zhijun makes the following classification: (1) accidents caused by improper teaching behavior of teachers; (2) Injury accidents caused by imperfect school management system; (3) Accidents caused by students exercising themselves during non-teaching hours; (4) Students in the normal teaching activities in the accident. And it can be further subdivided from the two dimensions of self and environment. The direct causes of their own adverse factors include improper cognitive behavior in exercise preparation and development (inattention, insufficient preparation, unskilled technique, excessive amount of exercise), poor physical health (malnutrition, excessive weight, myopia, abnormal vital capacity, etc.); Adverse environmental factors include bad weather, bad hardware facilities (bad field, failure of sports equipment), problems in teaching and management (unreasonable teaching content of physical education, lax school management, ineffective protection of teachers, etc.). The indirect factors include gender, age, sports participation, physical quality, personality characteristics, inappropriate behavior, stress and pressure, sports safety cognition, etc. Environmental factors include socioeconomic development, family factors (socioeconomic status, family relationships, etc.), school type, sports safety knowledge education (including students, teachers and parents), etc. In order to minimize the risk of injury, teachers should actively keep track of

students' physical conditions, conduct site equipment inspection before class, actively prepare lessons, enrich concepts and teaching methods, and conscientiously implement various preventive measures. (2) Students should learn self-protection, improve their ability to deal with injury accidents, actively participate in school safety education, actively buy school medical insurance, and fully do warm-up running before class and relax after class. (3) Schools should arrange safety education and training regularly to improve teachers' and students' awareness of self-prevention; To sum up, the prevention and countermeasures of school sports injury accidents can be mainly focused on the following points: (1) students themselves to strengthen safety education and accident handling contingency ability, understand their own physical conditions to carry out reasonable sports training and activities; (2) Teachers should do a good job in students' safety education, reasonably arrange and guide students to carry out physical education activities, improve their ability to deal with accidents, and do a good job in students' and parents' correct understanding of injury accidents. (3) schools for sports equipment facilities maintenance should be inspected regularly, establish school sports work safety responsibility system, set up school sports safety education and management work leading group to ensure effective running mechanism, build system of school sports insurance at the same time, ensure that the school sports injury accident liability disputes do have risk insurable.

4. STUDY ON THE MANAGEMENT PATH OF SPORTS INJURY ACCIDENTS IN COLLEGES AND UNIVERSITIES

China's new way of social governance is uni-dominant, multi-participation, each to do its part of the collaborative governance. Applying the new social governance theory to the management of sports injury accidents in colleges and universities will be helpful to the scientific and reasonable management of sports safety problems in colleges and universities. The school sports injury accident itself is a kind of risk event, which has the characteristics of sudden, uncertain and difficult to prevent. For its prevention can't simply due to the school, the student or any party, so will the school sports injury as a social problem, fully arouse the enthusiasm of all main body participation in society, the formation of multiple responsibility main body, set up fine prevention system, in particular, developing social organization to promote the institutionalization and legalization of school sports injury accident handling, form the multi-center collaborative work system. We should do a good job in legislation, improve the relevant legal system, education departments to improve the school safety work management system; Schools as the main place for students' sports activities to improve the management and teaching system, sports associations and insurance business entry. Gradually become a government-led, multi-participation model of ecological governance.

4.1 Government leads to provide solid legal system guarantee

Our country is a country of rule of law, solid legal system

is an important tool, guarantee the steady development of the social school as a public institution in the government functional departments, the talent cultivation of the whole country and society work, due to the functional properties of school characteristics, the government must have certain legal and institutional protection. Especially in the school teachers and students on the personal safety guarantee.

As the department in charge of schools, the Ministry of Education should give clear instructions and issue relevant documents to school safety. First of all, the school should formulate prevention and control and emergency response plans, with clear responsibilities and coordination among all departments. The purchase of school sports equipment must be controlled in accordance with the relevant product quality standards formulated by the state. In the process of dealing with sports injury accidents, it is necessary to assign responsibilities to the responsible departments and persons, so as to make the division of rights and responsibilities clear.

As a country with a legal society, the most important thing in legislation is to have laws to follow. Improving the laws and regulations on sports safety accidents in colleges and universities is an important basis for protecting the rights and interests of students, teachers and schools. By perfecting the legislation system of campus sports injury accidents and giving a clear legal definition and responsibility division basis, the occurrence of sports injury accidents and a series of unnecessary adverse effects after accidents can be minimized. Schools and students are the two main bodies in sports injury accidents. The legal relationship between the two parties in the handling of the accident is mainly based on civil law and administrative law. Therefore, in the improvement of the legislative system, it is necessary to provide clear legal provisions and the basis of liability judgment for campus sports safety accidents in these two laws. In the process of assuming legal responsibility and determining liability, the school should judge according to the severity of the accident circumstances, and the judgment criterion must be able to find the judgment basis in the relevant laws. For students as victims to protect their rights and interests of the main way is litigation law. Therefore, the follow-up protection compensation for victims in the legislation must also make a clear standard of legal judgment.

4.2 Improve the safety management system with schools as the main body

As the main place for students' daily sports activities, schools are more likely to be the site of accidents. Therefore, from prevention to accident treatment, the school must establish a clear responsible department and responsible person to improve the entire safety management system. School is the main place for students' sports activities, and also the main place where sports accidents happen. When students have sports safety accidents in school, the school is the primary party responsible for the accidents. Therefore, the school should make overall arrangements from the three aspects of prevention, management and emergency treatment of accidents to establish a sound management system. First

of all, we should establish a well-structured management and execution system with clear rights and responsibilities, so as to put the sports safety management into the responsible person. Before the accident, all administrative departments and teaching departments can ensure that students have a safe environment for sports activities. After the accident, the school health department, security department and teaching department can start the emergency plan quickly. In the first time to ensure the safety of the injured students, the accident investigation and evidence, for the subsequent responsibility of the accident to provide first-hand objective materials. In the organization of sports activities or sports competitions of a certain scale, schools should make corresponding safety plans in advance and set up corresponding safety control groups. Set up corresponding safety signs and on-site first aid points in the activity area. In the process of improving the management system, the most basic level is the team of teachers, who are in the first line of teaching and the first line of defense to reduce the occurrence of teaching accidents. Therefore, it is necessary to strengthen teachers' teaching safety management and emergency handling ability of injury accidents, and formulate corresponding annual assessment and reward mechanism. First of all, teachers should be regularly trained in teaching safety, including the correct inspection of site equipment, basic emergency treatment, trauma dressing, CPR and so on. Secondly, strengthen the study of sports safety management methods and legal documents, so that teachers can reasonably protect themselves in teaching accidents, avoid taking unnecessary responsibilities. Continuous learning to improve the professional teaching level, from the three stages before, during and after class to ensure the students' sports safety activities. Before class: have a certain understanding of the health status of all the students, especially those with medical history, should pay special attention to the teaching content of this class, have a clear grasp of the possible problems in the teaching plan and preventive measures, the teaching site and equipment in advance inspection and maintenance. In class: the teacher must lead the students to warm up, keep the body function in the best exercise state, and try to keep the preparation activities and classroom learning content have a certain link; During the teaching process, teachers should be able to control the whole class and ensure that every student is within the scope of the teacher's teaching. They should timely stop some dangerous actions and behaviors of students. Be good at observing students' practice state, and give timely attention and help to some students who are unwell in sports; For a class with a large number of students, a reasonable form of organization should be used, which not only helps to improve the density of practice, but also facilitates the organization and arrangement of teachers. After class, it is necessary to summarize the teaching situation of this class, reflect on and record some safety problems and treatment methods in class, and apply the experience to the next class.

4.3 Improve students' awareness of safety activities

Students are the main body of sports activities; students master the correct method of sports activities can prevent

the occurrence of injury accidents from the root. According to the investigation and research, the vast majority of students do not have the consciousness and habit of warming up when doing sports activities, and do not pay attention to their own sports wear protection. The first physical education class of each semester is narrative class. The teacher should tell the students the regular physical education class and the method of self-protection. To improve students' awareness of safety activities, teachers should pay attention to correct explanation and demonstration of technical movements in the teaching process, and emphasize the methods and essentials of protection and assistance for those in need of protection and assistance. In large-scale sports events held, the number of participants is large and the environment is complex. If students lack basic self-protection awareness, unnecessary injury accidents are very likely to happen. Therefore, teachers in this respect to carry out a targeted indoor classroom explanation. Some things of the school also need the support of social resources. In terms of sports, we need to cooperate with social institutions in the purchase of equipment, the construction of venues and the purchase of student insurance. No matter in class or after class, college students have certain sports injury risk. If sports injury or sports injury accident happens, the loss brought to the school and students must be minimized to the greatest extent. The improvement of campus insurance system can give schools strong protection from the side to reduce school pressure, so as to make school sports activities more vibrant.

5. CONCLUSION

Due to the variety of college sports events and competitions, there are official and unofficial forms of organization. In addition, in college sports events, almost every event has its own association, such as track and field Association, football association, basketball association and so on. An important role of the Association is to organize the orderly development of various events. However, according to the investigation, the association's handling mechanism for accidents in competitions is not perfect enough, and the subsequent medical expenses are basically borne by the athletes themselves. To some extent, this limits the enthusiasm of the athletes, especially for some risky sports. Therefore, a special relief fund should be set up in the sports association of the college union, which is specially used to deal with the accidental injury accidents in the events. In addition, the source channels of funds should be broadened. Sports events in colleges and universities are highly ornamental, so they should be open to the society and attract social resources through broadcasting and advertising sponsorship.

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License Plate Recognition Based on Convolution Neural Network and Transfer Learning

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Abstract: License plate recognition system is an important part of intelligent transportation system, license plate recognition is to use the uniqueness of license plate to identify vehicles. At present, license plate recognition system is mostly suitable for shooting scenes from specific angles, such as traffic fixed bayonet. In natural scenes, due to different lighting conditions, license plate deformation and other factors, license plate recognition system cannot accurately locate the complete license plate information. License plate recognition technology is very important to real life, such as intercepting illegal vehicles, the quality of photos is an important factor affecting the accuracy of license plate recognition. In this paper, through the improvement of neural network, the application of recognition technology in high equipment board, the use of automatic learning algorithm, the system can be used in adverse conditions of law enforcement, easy to obtain evidence on the scene.

Keywords: Convolution neural network; Transfer learning; License plate recognition

1. INTRODUCTION

In recent years, the rapid growth of car ownership in China is an important factor leading to road traffic safety incidents. There is an urgent need to curb dangerous vehicles running red lights in cities. The recognition system is based on vehicle identification and judgment, identifies violations, compares and analyzes suspicious vehicles in the public security information network through vehicle license plate database, and establishes intelligent network through network technology, which can meet the business needs in police traffic management cases. Vehicle identification system plays an important role in the management of fast parking lot, such as the application of management fees. Many large and medium-sized cities build intelligent transportation systems and effective data processing stations. With the development of intelligent traffic management system, automatic license plate recognition technology has more development potential. In this paper, artificial intelligence technology combined with image processing method is proposed to improve the license plate recognition accuracy and meet the actual system requirements.

2. RESEARCH ON LICENSE PLATE RECOGNITION TECHNOLOGY OF INTELLIGENT TRANSPORTATION SYSTEM

With the improvement of people's living standards, the number of motor vehicles is increasing. Car ownership

accounts for more than 72% of motor vehicles. The increasing number of motor vehicles in China creates great pressure for road traffic. How to realize the intelligent transportation society is the most important research topic of transportation departments in various countries. The introduction of intelligent transportation system saves a lot of investment for road traffic facilities. Intelligent transportation has evolved from intelligent vehicle road system. Through the comprehensive use of computer processing technology, data communication transmission technology and other cutting-edge technologies, a large-scale and efficient transportation management system has been realized.

Vehicle recognition system is the core part of intelligent transportation system, which extracts and captures vehicle license plate information. With the development of social information, LPRS is widely used in expressway toll station, community access control and other life, and the application of LPRS reduces the pressure of motor vehicles on urban traffic [1]. However, most of the license plate recognition systems in our daily life are aimed at the license plate devices in specific scenes. Under the conditions of different pixel ratios in natural scenes, they can not effectively recognize the license plate accurately. The research on license plate recognition technology is earlier in academia, but many algorithms need to collect images effectively in specific scenes. Convolutional neural network can simulate the function of human brain and has the advantages of complete theory and global performance optimization. Convolution neural network is not mature in many application fields, and it can obtain huge social and economic benefits by using high-tech to transform the traditional transportation system.

With the development of communication technology, license plate recognition system plays an important role in the development of intelligent transportation. Preprocessing in the early stage leads to the defect of license plate character segmentation and reduces the actual recognition rate. The traditional license plate recognition method is time-consuming, and it is difficult to fully retain the original signal. This paper studies and analyzes the mechanism of convolution neural network, and introduces convolution neural network method into intelligent transportation system, which can achieve good results in image recognition [2]. Research on license plate recognition based on convolution neural network, using improved neural network for license plate recognition, improving the efficiency of license plate equipment in

special situations, is of great significance to the construction of intelligent transportation system.

3. DESIGN OF LICENSE PLATE RECOGNITION SYSTEM BASED ON CONVOLUTION NEURAL NETWORK TRANSFER LEARNING

Fill in with "flooding filling method" and use the second classification of CNN network to select the prepared license plate. With the development and update of mobile terminal, the function of data camera is constantly improved, and the white balance of ordinary camera is realized. The pixel of Apple 6 camera is 8 million, and the photo effect is the same as that of 13 million pixels. A good mobile terminal can make the cameraman have a better perspective, and shoot the license plate under unexpected conditions, which can improve the image quality through personal appearance and other characteristics.

In the original image, gray image is used to remove noise, and Sobel calculation is used to remove noise, including Gaussian blur. Let I be the image matrix representation, I and $N \times N$ size kernel are combined with N and number n to form a number, $G_x = (Z_3 + 2z_6 + Z_9) - (z_1 + 2z_4 + z_7)$, $G_y = (z_7 + 2z_8 + Z_9) - (z_1 + 2Z + Z_3)$. $G(f) =$. Clear vertical edge images were obtained by bilateral processing. Because the vehicle license plate recognition system plays an important role in our life, the neural network is established in the field of computer vision. In order to explore whether the portrait recognition system can improve the recognition accuracy of the collected image of the license plate recognition system, a new neural network is proposed, which mainly studies the folding neural network. To avoid the instability of the traditional license plate recognition system, the traditional license plate recognition system business includes the detection of image preprocessing edge, get the specific license plate area information photos, and carry out the minimum external processing for each area. Initially, it became a candidate license plate area, and cultivated seeds to determine the color coordinates of information pixels, indicating the direction of the attic near the school and seed point. The pixel value should be analyzed and stored in detail.

In order to get the height of the rectangle cylinder, we need to get the size of the rectangle cylinder. The support vmachine algorithm trains the supervised learning algorithm through label data. $h: W * X - B = 0$ is the space supernatural surface line, $H_2: w * X - B = -1$ has the black and white dot set distance, h is the minimum distance,

margin gets the maximum value, the highest level is marked with "H", and the sample point is represented by H_1H_2 . CNN can be classified according to the principle of multiple classification. The remaining $n-1$ categories are classified into the same category. The second classification method provides the best way for classification.

The image is classified by CNN, and the readability of the image is balanced by the pixel filter. Firstly, the vehicle image is processed in the training cost, and the letter features are extracted as training data. The cumulative number of vertical and horizontal images is used for comparison. Each statistical line is calculated for each m character, and the result is consistent with the mhst vector. Finally, the M feature of eccentric font is moved to vector data. The data are processed in the input layer. The output value of each neuron is added with a path conversion element to launch to the next related neuron.

4. CONCLUSION

License plate recognition algorithm is the key problem to be solved in the application of intelligent transportation system. This paper studies the adaptability of license plate recognition algorithm in complex environment, and provides an effective method for effective vehicle management. Equipment technology is applied in the recognition board, and the system uses automatic learning algorithm. The system can be used for the purpose of law enforcement under adverse conditions. In this paper, the license plate is recognized separately, and the system can complete all steps from image to product, which is convenient and easy to transfer to other software. The system will use third-party orr to support more languages.

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An analysis of the Similarities and Differences of textual evidence in English Sinology

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Abstract: The study of "academic discourse" by scholars at home and abroad has once become an important topic in the communication and communication of different languages. The discourse analysis based on English and Chinese academic texts can better provide evidence for fulfilling the responsibility of information output link. This paper summarizes the basic characteristics of textual discourse substantiality in English and Chinese academic discourse, further analyzes the similarities and differences of textual discourse substantiality in English and Chinese academic discourse, and explores countermeasures for the translation of English and Chinese academic discourse based on the substantiality, so as to provide effective reference for the translation of English and Chinese academic discourse.

Keywords: English and Chinese academic discourse; According to the sex; Analysis of similarities and differences between

1. INTRODUCTION

With the development of modern society, scholars at home and abroad have further deepened their research on "academic terminologies". For example, English Chinese academic terminologies occupy a place in corpus linguistics and applied linguistics [1]. In the multi perspective and interdisciplinary research of academic discourse, the study of evidentiality and the commonness and individuality of the school's views become a feasible method to comprehensively study the connotation of academic language. This paper analyzes the similarities and differences of evidentiality between English and Chinese academic terms.

2. AN OVERVIEW OF THE EVIDENTIALITY OF ENGLISH AND CHINESE TERMINOLOGIES

Academic discourse is a place for writers to express their views. The evidentiality between different languages is directly related to the reliability of the speaker's information source, and requires the speaker to take the necessary responsibility for the speech published in his academic activities [2]. No matter what kind of language, in the existing expression and actual communication, it may adopt different attitudes such as affirmation, agreement, doubt and guess, which are directly related to the source of information.

3. SIMILARITIES AND DIFFERENCES OF EVIDENTIALITY BETWEEN ENGLISH AND CHINESE ACADEMIC TERMS

3.1 The same interpersonal function

Whether it is English academic discourse or Chinese academic discourse, evidentiality is used to indicate the content of language information, and then to judge the

authenticity of information. It is very important in the communication between two languages. In view of the attribute classification of different academic languages, we need to better organize them according to the language vocabulary, so as to accurately express our real ideas in academic exchanges. In academic language, sitting in the discourse and freely communicating with its subjective consciousness and content can directly face the application value of academic in grammar and semantics, and can also convey its clear purpose for readers and listeners [3]. If we take the evidentiality of English and Chinese terms as an important topic of interpersonal function expansion, we can express information in depth in the research field, and make information "based on evidence", so as to further realize cross language and cross disciplinary communication.

In academic discourse, in order to further maintain human-computer relationship, communicators are required to better maintain the completion of relevant mood, mood and tone in the process of people's communication, and to be able to express the content and attitude they want to convey in interpersonal communication [4]. In order to further achieve the effect of deep communication and contact, English and Chinese texts can better understand and express the clearing effect in interpersonal functional relationship.

3.2 Differences in language communication and evidentiality

In academic discourse, there is no unified definition of evidentiality. Taking English academic communication as an example, at the level of language communication, different evidential elements are formed by extracting information sources and credibility, especially in subject setting and research. The details are shown in Table 1.

Based on the analysis of the types and evidential elements of Chinese morpheme reverse words, in view of the academic discourse, the analysis of this kind of words can achieve good results from regularity and systematisms [5]. The specific types of word structures are as follows:

There are obvious differences in pronunciation, vocabulary, word formation, rhetoric and cultural background. In the aspect of phonetics, some words with the same morpheme in the verse of yuan and Ming Dynasties need to take care of the "sound conversion phenomenon" such as rhyme and tone coordination; while the insertion of syllables, polysyllabic words, understanding of grammatical relations, word formation to distinguish parts of speech, word formation to expand vocabulary to increase information carrier, cultural psychology and language habits of the Chinese nation are related [6]. By grasping the evidential context of different

terms, we can also capture the relevant national thinking habits, social and cultural characteristics and other cultural

Table 1 evidence element analysis of Evidentiality in English Academic Discourse

Evidence element	Communication content	Effect
Zero evidence element(Zero according to the element)	In student communication, the speaker needs to express what he wants to express clearly	No need to modify language skills, that is to be able to understand the whole thing clearly
Perceptual evidence element(Perception, according to the element)	According to the human body sensory experience, the micro expression of sensory information can clearly achieve the effect of psychoanalysis	It is more authentic to use words such as hearing and touching when expressing
Reporting element(Report according to the element)	Self report: the content of the information report issued by the author himself, or the relevant staff who participate in the report; expand by subject; others report: other sources quoted, mostly by third-party subject	Accurate reporting of relevant information
Evidential element (Reasoning according to the element)	To make a reasonable inference according to the facts; to express one's opinion with "would"	The speaker's guess is the most
Belief evidence(Faith, according to the element)	Most of the information comes from the speaker himself. He has a certain idea to explain what he wants to express. In English, he usually uses "think" to express	Express what the speaker thinks

Table 2 types and evidential elements of Chinese morphemes in reverse order

The types and evidential elements of Chinese Homonyms in reverse order	Content
United-United(Joint - - Joint type)	Part of speech analysis, verbs, nouns, adjectives, adverbs, conjunctions, etc
Bias-Bias(To the right -- to the formal)	Nominality-Red sun, Dilapidated house, Bright classroom, Great country Verb nature-Hard work, Hard exercise, Patient teaching, Hard hitting Adjective-Very warm, Very kind, Especially beautiful, Rock solid
Presentation-more formal(Presentation ——— tends to be formal)	Blood red hot cold, red eyes hot teeth cold, whispering mischievous airdrop
Statement-Dominance(Statement -- Dominant)	Dominant style: sorry, over age; supplementary style: grasp; declarative style: superficial, tinnitus, dizziness
Supplementary-formal(Supplementary ——— More formal)

4. TRANSLATION STRATEGIES BASED ON EVIDENTIALITY

4.1 Exerting the interpersonal function of evidentiality

In the process of English communication and interaction, giving full play to the interpersonal function of evidentiality can create a good environment for English Chinese translation, maintain interpersonal relationship in academic discourse, and achieve a unified translation standard through the rational use of Evidentiality in sufficient understanding, communication and communication, so as to express accurately in foreign trade exchanges and business negotiations and provide reference for the future. The two sides provide conditions for harmonious relations.

4.2 Seeking similarities of evidentiality

Based on the analysis of narrative and historical situation in free indirect discourse, this paper holds that the grammatical concept of speech context should be divided into ideological context and discourse context. Tense and person depend on the context of discourse, while all other deixis (including here, now and deixis) are evaluated according to the context of thinking. Free indirect discourse and history are now analyzed as the possibility of special combination. When the two contexts are completely different, one of them happens to be the same as the physical point where the sentence is connected.

4.3 Seek the source of evidence for both

Acceptable academic evidence depends to a large extent on who it will be presented to, the areas in which they work, and the focus and objectives of the positions being debated. To be convincing, it must be based on facts, well-

reasoned, logical, and able to stand up to opposing arguments. It will include facts, research results, citations, experience and the work of others. Logical and textual evidence is generally considered to be more authoritative -- stronger and more persuasive than anecdotal evidence or emotional appeal. To gain academic recognition, evidence must meet the following criteria: evidence must come from a credible source: just because someone has written a topic or question does not mean that your readers think they are authoritative [7]. Authority is judged by how much experience the source has, the feasibility of their research methods, and their previous reputation. The evidence must come from acceptable research methods: if you are using any form of quantitative or qualitative research, observe them carefully. A survey of five people is hard to convince. In a sociology class, a survey of 100 people may be acceptable, but it is less authoritative for the audience of scientists. The evidence must be replicable: if you use the original study, replicating the same conditions and methods should produce the same results. Using the same source, you should find the same information. However, personal experience and observations are hard to replicate. The responsibility for morality and honesty lies with the author.

Evidence must be authoritative and factual: according to different disciplines, the so-called facts vary greatly. In women's studies classes, personal experience may be important, but it does not meet the criteria for scientific papers. Your audience must believe that all your evidence and sources are authoritative.

4.4 Improvement in communication

In the evidential translation of English Chinese academic discourse, it is necessary to rationalize the mood and communication mode between different languages, so as to make both sides feel relaxed and comfortable with proper mood, and achieve the effect of dealing with contradictions, euphemistic communication and accurate expression in word communication. At the same time, through increasing mutual trust, empathy, conscientiously perform their duties and take the necessary responsibility. At the same time, it also improves business cooperation negotiation through evidentiality, modifies sentences and words, and gives full play to evidentiality to better express in English.

5. CONCLUSION

In the study of Evidentiality in English and Chinese academic discourse, in order to facilitate the free communication between languages, it is necessary to be familiar with the evidentiality of English communication and its differences in daily life. It is very important for the users to clarify the evidentiality of English and Chinese terms. It can better adapt to the needs of environmental factors, realize the communication and cooperation between the two sides, and further improve the quality of business negotiation between interdisciplinary languages.

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Research on the Current Situation of Taekwondo Development of Chinese College Students

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Abstract: In recent years, Taekwondo has been developed rapidly, now it has gradually integrated into the college sports classroom, and has been recognized and loved by more and more Chinese college students, and Taekwondo character is one of the key components, which effectively realizes the integrated development of spirit, psychology, body and self-protection with the continuous development of Taekwondo, there are still some problems in the development of Taekwondo. Based on this background, this paper studies the current situation of Chinese college students' Taekwondo quality development for reference.

Keywords: Chinese college students; Taekwondo; Character; Development status

1. A BRIEF INTRODUCTION OF TAEKWONDO

The so-called Taekwondo character, as far as character is concerned, can be interpreted separately. "Character" represents character, character and character, while "momentum" can be interpreted as momentum, posture and demeanor. On the other hand, it also has the meaning of Taekwondo Athletes' personality, appearance and perfect movement.

For the Taekwondo character, it is essentially composed of the basic movements of Taekwondo and the application of fighting. From the side technology, it is Taekwondo. The basic movements can be seen as the preparatory movements of Taekwondo character. Fighting is the actual combat application of Taekwondo character, and the character is the core and soul of Taekwondo. Every Taekwondo Athlete's stage area gets the level of character. It can effectively explain the level of basic skills and the depth of Taekwondo spiritual understanding. Paying attention to the cultivation of Taekwondo character can further improve the athletes' spirit, physical quality and self-defense ability. Taekwondo style is mainly composed of traditional style and new style. Traditional quality refers to 8 sets of Taiji style and 9 sets of Duan style, while new style mainly refers to 10 sets of style according to age range [1].

2. THE CURRENT SITUATION OF TAEKWONDO DEVELOPMENT OF CHINESE COLLEGE STUDENTS

2.1 Lack of systematic training and weak basic skills

For most college students, they just like Taekwondo, but they don't know enough about Taekwondo's character. Therefore, in the actual training process, they often choose from other projects and don't carry out character training, which makes them not experience systematic training. As a result, their understanding and practice of Taekwondo

are limited, and their basic skills are generally weak. However, taekwondo character must be in the long-term continuous periodic training process, in order to achieve the improvement of action route, angle, height and breathing. At present, in Taekwondo competition, due to the lack of strong technical foundation, it has become a common phenomenon for students to sharpen their guns in the field.

2.2 Lack of character coach and poor guidance ability

For the teaching of Taekwondo in Colleges and universities in China, although it has been equipped with enough coaches, there is still a lack of coaches for Taekwondo character. Therefore, although most coaches' technical ability meets the teaching standards, their own character level is still relatively insufficient, which makes the actual teaching guidance for students unable to meet their learning and training needs. As a result, the students' overall learning ability cannot be further improved under the guidance of scientific training.

2.3 Lack of attention to Taekwondo Development of College Students

Taekwondo, as a sport, has a positive significance in promoting students' physical and mental health. In recent years, it has gradually stepped into a reasonable, orderly, healthy and sustainable development track in Colleges and universities. However, for Taekwondo event, colleges and universities still have insufficient understanding and lack of attention in ideology. Most schools think that Taekwondo event is only a sport. Taekwondo is a regular event in international competitions, which is of little significance in domestic or daily practice or competition, so it is difficult to get due attention. On this basis, our country has not given reliable policy, capital and equipment support for Taekwondo, which further leads to the misunderstanding of coaches' training investment and training intention. It is decreasing continuously [2].

3. EFFECTIVE STRATEGIES TO PROMOTE TAEKWONDO DEVELOPMENT OF CHINESE COLLEGE STUDENTS

3.1 Strengthen systematic training and improve basic ability

In order to promote the continuous development of Chinese college students' Taekwondo, we need to pay attention to the systematic training plan for students, so as to achieve the improvement of students' overall competitive level with the help of excellent scientific training methods, and effectively avoid the possible sports injury. Based on this, the coach can formulate targeted training methods for students in combination with the

actual time of holding various events At the same time, we also need to pay attention to the physiological training of students, so as to achieve the auxiliary improvement of the overall ability from the body, vision and breathing. On the other hand, the coach also needs to realize the reasonable training of the technical essentials in the character project according to the guidance book of the competition rules And combined with the actual competitive case teaching, strengthen the students' in-depth understanding of the character movement, better realize the unity of form and meaning.

3.2 Attach importance to the establishment of teachers and carry out special training

Colleges and universities need to pay attention to the formation of moral teachers' team, so as to effectively improve the level and ability of teaching guidance. Based on this, colleges and universities can be based on the development concept of "going out, introducing", advocate coaches to actively learn advanced experience and technology, so as to continuously improve their professional quality and comprehensive ability. In addition, they can also pay attention to the guidance of foreign teachers The introduction of excellent coaches, so as to be able to combine with China's teaching guidance methods, better optimize the teaching level and the efficiency of guidance, and, in view of this, we also need to develop scientific evaluation indicators, combine the college students' sports performance with their coach ability standards, and promote the quality of teaching and training.

3.3 Promoting the sustainable development of College Students' Taekwondo

We should pay attention to the sustainable development of College Students' Taekwondo from the following aspects.

3.3.1 First of all, taekwondo character can be integrated into campus culture, so that students can be imperceptibly influenced on the basis of their study and life, so that they can use their spare time to cultivate their character, so as to effectively optimize their physical and mental level, cultivate their sentiment, improve their physical function and self-defense ability. In addition, they can establish a wide range of good relationships among students On the

other hand, it can further promote the propaganda and promotion of Taekwondo.

3.3.2 The combination of character project and physical education course can enable students to understand offensive and defensive skills in physical education course, strengthen their psychological training, and effectively enhance their self-confidence and spiritual quality. In addition, it can also improve their physical quality and cardiopulmonary function, effectively let them experience the charm of character project, and improve their learning enthusiasm [3].

3.3.3 The combination of character events and competitive events, competition is the practice of character movements, coaches need to pay attention to give students reasonable practice opportunities, so as to strengthen their mastery of all kinds of offensive and defensive movements. In addition, they can also effectively use the time of character events to let students deeply explore the offensive and defensive principles, so as to promote their own character development and ensure the activity of character events.

4. CONCLUSION

To sum up, there are still some deficiencies in the development of Taekwondo character of Chinese college students, and relevant personnel need to pay attention to it, and constantly strengthen the composition of teachers, take reasonable training and practice methods to promote the cultivation of students' character, and promote its sustainable development.

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Development and Application Analysis of Agricultural Product Safety Detection Technology

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Abstract: With the rapid development of science and technology in China, great changes have taken place in the operation mode of all walks of life, in which the safety detection technology of agricultural products is one of the important contents in the development process of agricultural products, because the safety detection technology not only maintains the safety and quality of agricultural products, but also guarantees the safety of people's lives. In this paper, the author analyzes the development status of agricultural product safety detection, and expounds the related quality detection methods.

Key words: Agricultural products; Safety detection technology; Development; analysis

1. INTRODUCTION

At present, due to the use of pesticides, chemical fertilizers and other chemical products in China's agricultural products, many crops contain a lot of toxins, and the emergence of "Sudan red", "Fuyang milk powder", "Sanlu milk powder" and other incidents has led to some doubts about any food. Therefore, it is necessary to strengthen the implementation of agricultural product safety detection technology, and deal with and solve the problems in a timely manner.

2. DEVELOPMENT STATUS OF FOOD SAFETY DETECTION TECHNOLOGY

At present, there are many kinds of food safety detection technologies in China, such as biochemical technology, molecular spectroscopy technology, enzyme inhibition technology, etc., which show that China attaches great importance to safety detection technology. The use of these technologies not only improves people's living standards, but also expands the scope of crop quality and safety, which has an important impact on the safe use and development of agricultural products. And the continuous development of society also makes the change of safety detection technology more and more big, especially in this Internet era, more need our country's relevant safety detection department to establish their own network, and strengthen the importance of agricultural products. According to the current development of food safety detection technology, the following contents are analyzed.

2.1 Attach importance to the development and use of advanced technology, and constantly reform and innovate Since the realization of market economy in China, China has started the safety detection of agricultural products, and this technology is constantly improving with the progress of our society [1]. Therefore, in this environment,

it also strengthens the detection intensity of agricultural products by relevant departments in China, such as the research of *Aspergillus flavus* and the use of natural toxin residue detection technology, which shows that China's food safety detection technology is improving, which is also the replacement of the old food detection methods in the past. Therefore, in order to make the long-term development of food safety detection technology, we need to follow The pace of the times is constantly advancing and developing.

2.2 Establish a sound management system and strengthen the supervision responsibility of relevant departments

Any work unit needs a perfect, standardized and scientific management system, which can not only promote the harmonious development of the unit, but also one of the important factors for long-term development. In China, there are many food safety departments, such as safety inspection department, health department, agricultural department and so on. The purpose of these work units is the same. They manage and control the marketing of agricultural products together, so it needs mutual help among various departments. If we want to make achievements in these areas, we need to improve the input, supervision and supervision of agricultural products, and also need to strengthen the technical level of agricultural workers.

2.3 Improve the technical level of safety detection system and implement it

In order to further ensure the safe use of agricultural products, we can make use of the rapid detection vehicle to carry out a wide range of agricultural products detection in the technical detection of agricultural products, which is more convenient and fast. And the improvement of detection technology is also to promote the maturity and marketing of agricultural products, but also to improve the overall quality of agricultural products [2]. Therefore, in the development of agricultural product safety detection technology should run through the process of agricultural product quality and safety assurance, so as to make the whole process play an irreplaceable role.

2.4 Improve the product certification methods, and refine the types of agricultural products

In China's early society, the scope of certification for agricultural products is very small, and the number is not much. However, after many years of development and the accumulation of agricultural product safety testing staff, the agricultural product industry presents more healthy, environmental protection and organic agricultural products, and the cognitive style of agricultural products

has become diverse. And in order to better stimulate people's consumption, we must let producers pay attention to the importance of green and healthy crops. In addition, we also need producers to have a certain overall view of food safety, so as to let consumers use it steadfastly.

3. THE APPLICATION OF AGRICULTURAL PRODUCT QUALITY DETECTION METHODS

3.1 Detection of pesticide residues

In the process of crop cultivation, growers will use some pesticides to help crops grow, and in order to ensure the quality and safety of crops, we need to improve the detection technology of crop residues. However, with the continuous reform and innovation of China's agricultural product safety testing technology, some new testing methods are widely spread, such as atomic absorption spectrometry, biosensor method and so on. In addition, in the traditional planting process, the growers did not pay attention to these detection methods, resulting in the growers will indiscriminately use chemical fertilizers and pesticides, resulting in a lot of pesticide residues in agricultural products, and the chemical composition of different pesticides are different, so the relevant detection departments need to improve the level of pesticide detection.

3.2 Detection of small bacteria content

In the detection of small bacteria content, the traditional detection method is to detect the content of small bacteria by microcalorimetry or impedance measurement, which can not only quickly detect the number of small bacteria in crops, but also is very convenient to use. In addition, the use of grain fumigant can inhibit the reproduction of pests to a certain extent, but this method also has some disadvantages, its use will have a certain impact on food. In addition, the storage of agricultural products also needs to carry out quality inspection, which can greatly improve the quality of agricultural products in storage.

3.3 Rapid immunoassay

This kind of rapid immunoassay test method is implemented through highly integrated inspection equipment, mainly with chip as the main core, high-speed and fast detection of food safety. At present, this technology is most widely used in food health screening. Therefore, the rapid immunoassay test method has a very broad development prospect and huge development space, which is a promising method. It is a new era of high-tech means [3].

3.4 Detection methods in storage of agricultural products
Any crop will use different storage methods, and storage standards are also different. If the user does not store properly, it is easy to rot, and people will have many adverse reactions if they eat these crops. Therefore, it is very important to check the storage of agricultural products. For example, a large agricultural product company uses infrared analysis equipment to scan and detect agricultural products, which can not only effectively distinguish which agricultural products are not up to the standard, but also greatly improve the work efficiency of testing personnel.

4. CONCLUSION

To sum up, the saying "food is the essence of people's life" fully illustrates the status of food in people's life, and crops are the basis of all food. Therefore, it is necessary for China to give full play to the advantages of large land and abundant resources, and make rational use of agricultural resources and technology, so as to make China's agricultural development more rapid. In this paper, the author analyzes the technical reform and innovation, the improvement of management system and the improvement of safety detection technology level in crop safety detection technology, and expounds the detection of pesticide residues, small bacteria, and the detection of agricultural products storage, hoping to bring help to the relevant crop safety detection personnel.

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Research on the Connotation of Ideological Education in College Physical Education Curriculum

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Abstract: For a long time, people's concept of sports is to stay in sports is to strengthen the body, the view of sports is very one-sided. The function of physical education has never been explored beyond the scope of the interrelationship with health. However, as an important aspect of education, physical education not only has the function of physical education, but also has a unique significance for the balanced development of human body and mind due to its unique form, which makes physical education of great significance for the promotion of people's overall development and the improvement of people's ideological and moral level. Therefore, at the national level, it also has important ideological and political connotations.

Keywords: College Sports; Ideological Education; Connotation of The Research

1. INTRODUCTION

American educator Ralph Taylor's curriculum development principles are considered to be the most perfect. His curriculum can be seen as a four-stage process, starting with the determination of teaching objectives, then the selection of course content, then the organization of course content, and finally the evaluation of the course. In fact, if you look at the whole process of education, this process stage is also applicable. If we educate students, we should determine what they should learn, what they should master and what kind of values they should form in this stage of education, which is the process of determining teaching objectives. Focusing on teaching objectives, we should then think about what kind of teaching experience can achieve these objectives. How to organize these teaching experiences so that students can better accept the teaching content and the transmission of teaching experience is effective? That is to say through the specific teaching mode, teaching strategies, teaching methods to organize teaching activities, transfer teaching content, promote the realization of the goal. Because teaching is a large scope, we must take teaching context and teaching environment into consideration, which is an important external factor affecting the effectiveness of teaching. Finally, through teaching evaluation, the final evaluation whether the original teaching objectives have been achieved. Based on these goals, we can explore the ideological and political education function in college physical education. Because sports is a part of promoting people's all-round development, not only can improve people's physical quality, through sports activities can also

promote the development of a sound personality, to become a healthy person. The important function of ideological and political education is to cultivate people with healthy values. To ideological and political education into the sports, must grasp the direction of the education content, strengthen the infiltration of ideological and political education at the same time, because the choice of the education content, root around education goal, is through the sports teaching, sports activities carried out and positive guidance, to infiltrate patriotism education, the common ideals of the Chinese nation, the noble moral sentiment and social responsibility [1-10].

2. IMPROVE THE EFFECTIVENESS OF IDEOLOGICAL AND POLITICAL EDUCATION BY INJECTING SPORTS SPIRIT

From content to determine to implement, colleges and universities sports curriculum at present there are three main problems: first, the content is lack of humanistic psychology care, do not take students as a starting point, education content more systemic is tough to give students and ignore the feelings, and often unilaterally sports activities are always regarded as the only content. Second, the content lacks unity and flexibility of the combination, too rigid, cannot be done according to the new, for students to choose almost no space. Finally, the content is too simple, mainly reflected in the physical and mental health, sports leisure and spirit, and other aspects of the internal capacity is too small. The problems in the above three aspects lead to the fact that the PE curriculum cannot keep pace with The Times under the constant requirement of renewal. For the above problems to be fundamentally improved, specific curriculum content must be established according to different levels of goals. Focus on physical health, motor skill learning and participation, mental health, social adaptation and so on. Develop students' strength, speed, coordination, flexibility, endurance, agility and other physical abilities scientifically and periodically through the development of various physical skills. On the basis of the existing basic sports, moderately guide students to increase the load of sports, develop healthy habits. Systematically enhance physical fitness, and ultimately improve the overall national physical quality.

We should not slack off in the study of motor skills. Athletic skills should not be taken as the core of college sports education, nor should the development of competitive sports be abandoned, because in addition to its connotation, universities also shoulder the

responsibility of cultivating excellent competitive athletes for the country. As a matter of fact, our country is immature in the popularity of many competitive sports on campus, which can also be said to be backward. In particular, the collective competition, tactical dominant type of sports. Therefore, in the physical education stage of higher education, it is necessary to strengthen the development of collective, competitive and tactically dominated, antagonistic sports. This arrangement of physical education content has the following advantages: First of all, entering the stage of higher education, people's physical development is mature, is the best stage of physical function; Secondly, this stage has a strong understanding ability and a lot of time for independent study. It is especially suitable for students to find a team sport suitable for them, which is of great significance for promoting the collectivism spirit of students. Finally, the training of collective projects is conducive to enhancing the friendship between students and promoting the mutual encouragement and influence among peers.

In the process of participating in sports activities, relevant sports rules, sports thinking mode and sports spirit will affect people's behavior choice. Such a comprehensive shaping of a person is the unique role of college sports in cultivating all-round talents. Because of this characteristic, college physical education not only extends the way to cultivate talents, but also becomes the best window to see the excellent talents from it. At the same time, physical education gives many disciplines a perspective to integrate with it. As an independent discipline, the combination of physical education and education, economics, management, media, medicine, chemistry, biology, mathematical statistics, aesthetics, etc. , enriches and broadens many research fields that can be integrated with it.

College sports to lifetime sports thought is of great significance in the formation of a person, selectivity and the characteristics of the autonomy of college sports, students can be found through the understanding of their own for their own and can continue movement, and college sports need to do is to make students realize the meaning of lifelong sports for their sustainable development in an all-round way, thus love sports; Be sure to diversify the content of your classes by offering students a variety of sports options. When objective teachers are not enough, students are encouraged to set up clubs to form a rich campus sports culture atmosphere. College sports can also promote the inheritance of sports culture, which has great cultural significance and political significance beyond primary and secondary schools. College sports is an important way to promote the socialization of people, and the important quality of socialization is the sense of responsibility. This is also of great significance to the development of society. The teaching content should be more focused on the collective creation of the teaching content, focusing on the way of group learning, so that students learn to cooperate in a small team, learn to take responsibility, and pursue the enterprising spirit in a large group, so as to truly inherit the sports culture and sports Olympic spirit. Moreover, as

a kind of public social resources, the university's sports venues are regularly opened to the public, which is also a manifestation of the university's spirit of contribution and freedom and openness. College sports are also a way to develop high-level athletes. The cultivation of student athletes is a reform of the whole country system and a new mode of development. At the same time, it is an ideal means to cultivate the comprehensive quality of athletes. It is in line with Olympism, that is, a philosophy of life that enhances the physique, will and spirit, and makes them develop in an all-round and balanced way.

3. CONSOLIDATE THE POSITION OF IDEOLOGICAL AND POLITICAL EDUCATION BY INTEGRATING SPORTS CULTURE

Teaching environment is an important topic discussed in the education circle, which emphasizes the influence of environment on people. There are Mencius who choose their neighbors, and there are those who keep close to ink. As Shakespeare said, wisdom is a part of man's destiny, and the external circumstances he faces will surely affect his consciousness. The results of environmental studies confirm that the environment has the functions of orientation, cohesion and radiation, and specific environments can create specific cultures and specific behaviors.

The external environment of physical education includes sports facilities, stadiums and gymnasiums, as well as weather conditions, air quality and other parts not subject to human will. The humanistic environment of physical education, including the environment construction at campus level, college level, grade level and dormitory level, involves the mutual influence between teachers and students, teachers and students, and finally forms a subtle influence. As a group, universities are normative and stable, and their long-term mutual influence inevitably leads to the assimilation of behaviors.

Students in higher education have extremely high self-learning ability, but it is not to ignore the role of teachers. On the contrary, teachers in the higher education system should not only have rich theoretical literacy and strong scientific research ability, but also excellent teaching ability. As the output end, teachers, as the good teachers of higher education, shoulder the important role of enlightening the public, shoulder the heavy responsibility of cultivating the builders of socialism with positive energy, lofty ideals, solid theory and strong practical ability. Physical education teachers in higher education should not only become coaches of sports skills, but also be able to let students experience the power of sports spirit through a variety of ways and establish perfect personality through empathizing with sports spirit. So what kind of quality and ability should PE teachers have? And how should we improve the physical education teacher's ability? For PE teachers, they should first have a solid grasp of the learning content and subject knowledge they teach, and form a complete theoretical system. Secondly, we should strengthen the improvement of teaching skills and innovate the teaching methods. Finally, the professional ethics and daily behavior norms of PE teachers should be strengthened. This is a requirement in the competence of

the teacher. At the same time, it is necessary to improve the systematic training of physical education teachers, from university education to vocational training, to form a continuous learning of the latest teaching theories and thoughts through pre-service education and retraining after taking office. In addition, at the national level, efforts should be made to carry out education reform, improve the construction of teachers, and optimize the teaching ability, teaching thought, academic accomplishment and moral quality of teachers. This is not only the requirement of teacher education specialization, but also the most basic requirement of teachers in the process of socialist society construction.

From the perspective of educational psychology, teachers' cognition of the comprehensive ability displayed by each student has different expectations on each student, and such expectations, acting on each student, will have different influences on the development of students. The famous Rosenthal Pygmalion experiment has verified the significance of teachers' expectations on students' development. Let's not talk about how unfair and unreasonable this Pygmalion experiment is for students, but we have to say that the expectation effect is reasonable. Because of the difference in perceived expectations, they will be reflected in their own behaviors. When the students accept the positive expectations of the teacher, they will work harder along the corresponding development direction. This process is repeated repeatedly, and finally the students realize the expectations of the teacher. Therefore, in our educational reform, we must take the optimization of the teacher structure as the top priority to improve the quality of teachers. Optimize the structure of teaching ability still has an important significance is that help to promote teacher cooperation, the establishment of friendly harmonious relations between teachers and students, this is a harmonious and democratic teaching atmosphere, conducive to the activities of the teachers and students in the aspect of communication opportunity number increase, the consciousness of initiative will also strengthen, so the more effective teaching. In order to give students a better education, teachers' knowledge skill level is not enough, the modern education, the need to take the student as the main body, promote personality development of students, so for students to create a friendly, equal and happy learning environment, let the students to experience the feeling of success and build a respect class, democratic classroom, eventually to carry out effective teaching. Therefore, the teacher ability structure is not only reflected in the construction of the teacher team, but also reflected in the knowledge level of each teacher. The direction of optimization is that our teachers are able to teach, can effectively teach, can teach healthily, can help students to promote mental health. In addition, teachers' ability structure also includes forming their own teaching style, systematic teaching, structuring their own knowledge, and forming their own independent and efficient teaching system. In fact, there are still many problems in our education process. It is still very difficult to solve the problems at the level of physical education teachers at the grassroots level. The number of physical

education teachers at the grassroots level is insufficient, and the brain drain is also quite serious. The optimization of teachers' team, the macro-control of teachers' regional distribution, the formation of teaching system such as teachers' teaching ability, and the construction of teachers' individual comprehensive quality and ability structure are all what we need to accomplish in our optimization and reform. To optimize the ideological and political objectives of university physical education, we should optimize the whole process of education, realize the all-round development of human beings, realize the four-dimensional view of physical health, and make constant efforts to cultivate builders who are both capable and virtuous for social development.

4. OPTIMIZE THE WAYS AND MEANS OF IDEOLOGICAL AND POLITICAL EDUCATION BY FITTING IN WITH THE PROCESS OF PHYSICAL EDUCATION

In addition to the content of physical education curriculum evaluation and the in-depth exploration of the deep connotation of physical education, the scientific evaluation also needs to be improved. Due to the individual differences of students, if students are not evaluated on the journey from beginning to end, only taking teaching results as the criterion for the realization of teaching objectives will affect the formation of sound personality of students with poor foundation. If we blindly emphasize the results and ignore the process of students' self-absorption and digestion, then students will not be qualified with a sense of collective honor and enterprise, which will do great harm to the growth of students and the society.

5. CONCLUSION

This developmental evaluation can also help students to recognize their own shortcomings. When witnessing one's own growth step by step through developmental evaluation, such successful experience will help students to increase their confidence and thus be more willing to participate in social construction. So how should the measurement standard of such development evaluation be reflected? Know the past we use general evaluation to measure whether the student has reached the standard, and curriculum evaluation system optimization, should pay attention to the quantitative evaluation, index quantification study can not only measure student movement skills, more able to judge students in physical education teaching activities gradually fostered by the physical health level, the mental health level and social activities exchanges will, interpersonal skills, patriotism and ideological development. The validity of the function of ideological and political education can be roughly judged through specific relevant statistical data.

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Application of Java Programming Language in Computer Software Development

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Abstract: At present, with the rapid development of network information technology in our country, the use of Internet technology in various industries has produced good results, especially the development and use of various software, which provides fast and convenient services for people's production and life. The basis of software development is computer programming technology. Java programming is a widely used programming method in programming technology. This paper analyzes the characteristics of Java programming language, and discusses the application measures of Java programming language in computer software development, so as to provide reference for relevant personnel.

Keywords: Java programming; Object oriented; Computer; Software development; Application measures

1. INTRODUCTION

At present, in the process of computer software development in China, Java programming language is effectively used for software development, and has won the recognition and approval of many software developers. Because Java programming in the development of software with simple, personalized, mobile features, and more widely used in daily use, so the development prospect of Java programming is good. Software developers need to effectively apply Java programs to promote the development of computer software development in China.

2. ABOUT JAVA PROGRAMMING LANGUAGE

2.1 Definition of Java programming language

Java programming language has the function of writing. It is a kind of programming method that can change the ability of platform software. It has been widely used after being popularized at the end of last century. Compared with VB and VF, Java programming language is more flexible and relatively simple, because it can operate across platforms, and Java programming is multi type and highly compatible, so it has a good reputation among software developers [1-6].

2.2 Features of Java programming

Java language is derived from C++ language, and has unique characteristics in the process of derivation. The specific performance is as follows:

2.2.1 High compatibility of Java platform

Java platform is an independent individual, which is suitable for a variety of operating systems at runtime, and has high compatibility. In the process of programming can write any computer compatible code, so the requirements of the application platform is not high, and the program can be self checked and loaded, and automatically

generate machine code after the check.

2.2.2 Flexibility of Java platform application

Java programming programs can run freely after downloading from the website, while other programs are generally built on a certain computer or system, which has certain limitations. Java programs do not exist in this situation. People can directly download and use whatever computer or operating system they use after searching for the required program through the web page [2].

2.2.3 Multiline operability in Java programming

Java programming process can improve the efficiency of software developers, only because it has the characteristics of multi line operation. In the process of surface object programming language to be described below, Java programs can execute multiple instructions at the same time, so developers can implement multiple tasks at the same time. Based on the mature multi thread function of Java programming, users can experience the data sharing function in real time.

2.2.4 Object oriented concept of Java programming

Object oriented programming is a qualitative leap in the development of programming. It changes the old mode of process oriented programming first and then programming. Java programming has the function of object-oriented programming. Therefore, after fully mastering the object-oriented programming, Java programming can be carried out.

The main goal of object-oriented programming is every object, including some user-oriented specified functions in each object. The objects in Java programming are extracted from the JDK standard library, but the specific class functions of objects need to be written by developers independently [3].

2.2.5 Security performance of Java programming language

With the rapid development of Internet technology at this stage, there are many bad information problems, such as virus intrusion. Java programming is more flexible, and the language is more secure, through object-oriented programming, for instructions do not need to process data, so virus software or intrusion behavior can not receive information data through Java programs, and then can protect computer security. In addition, Java programming language transmits byte data after encryption, so it can ensure that the running program is logical, and the program distribution in each object category is relatively random, and the intruder or virus can not find the relevant information to attack, so it greatly guarantees the information security of the computer.

3. APPLICATION MEASURES OF JAVA PROGRAMMING LANGUAGE IN COMPUTER

SOFTWARE DEVELOPMENT

3.1 Application in Android system

Android system is one of the most commonly used mobile phone operating systems. The software in the mobile application market is developed according to Java programming language. In the process of carrying Android system, the advantage of Java programming is: because the operation process of different brands of mobile phones in Android system is different, it is impossible to develop a system for mobile phone brand in the process of software development. After using java program, it can be effectively compatible with any system, greatly improving the software quality of Android system application market. Java games were very popular with the public many years ago, and with the diversification of mobile games, Java programming is also constantly improving, and can better adapt to the system under [4].

3.2 Application of Java programming technology in financial field

Because of the security of Java programming, Java programming is also effectively used in the financial field, such as the third-party financial platform, banking and other language program systems.

The particularity of the financial field determines that it has high requirements for the privacy and privacy of information, so as to enhance the trust of financial customers. The independence of Java programming language determines that its storage mode is random. Therefore, if the financial system is invaded by foreign hackers, valuable information can not be obtained through the Java programming system, which improves the security performance and ensures the data security of the financial system [5].

3.3 High frequency trading in the financial sector

At present, there is a new type of operation mode in the financial field. This mode has very high requirements for the response degree and time of the program. If there is extremely slight time delay in the operation process, the trading behavior in the transaction process can be seriously affected. In view of this special situation, Java programming can optimize and improve the operation environment, and can be compatible with multiple systems without affecting the operation time, which effectively solves the high-frequency operation problem of financial personnel, and improves the application efficiency of Java programming in the financial field.

3.4 Java programming for website game running

In recent years, many web game enthusiasts have found that some classic games can not run normally. The reason is that the programs of these games are transplanted through VB system. With the rapid development of network technology, the current computer or various mobile phone operating systems can not read the previous programming language. Therefore, in order to solve this problem, we can run these game systems in Java programming. Through Java re programming, we can

ensure that the classic games in the past can run effectively in the current system [6].

4. CONCLUSION

In a word, the application of Java programming language in computer software development is very important. Java language is a kind of language with high application rate in the current programming language, and its application range is relatively wide. Moreover, many enterprises are also using java language to build websites. Moreover, because the Java syntax is relatively simple, programmers will not make some mistakes, and It is easy to operate and run, and Java programming language has significant advantages in engineering cooperation and maintenance, and the development environment is more open, which can improve the efficiency and quality of programming, and does not need to be processed again. Therefore, Java language needs the relevant personnel to have a positive understanding and profound attention, and to improve the application efficiency and application quality, so as to promote the development of Internet technology and programming work.

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Research on Teaching Reform of “English Listening” Course based on Internet from the Perspective of OBE Concept

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Abstract: Under the background of the new era, with the continuous development of information technology, the Internet is gradually integrated into the College English education ecosystem, which has a significant impact on College English Teaching in China. As one of the basic contents of College English, College English listening course runs through the whole college English teaching system, which is of great significance to the cultivation of College Students' English application ability and listening and speaking ability. Under the background of "Internet plus", OBE concept has been gradually applied to college English listening teaching, which has effectively strengthened the results of College Students' English listening learning and made students' driving force of English listening learning improved significantly. Under the OBE concept, it is necessary to integrate the "Internet plus" educational ecology factor into the teaching of College English listening course, which can effectively improve the teaching quality of the current college English listening course and promote the reform of College English listening teaching. This paper studies the teaching reform of Internet plus based English Listening Course under the concept of OBE, and seeks a new path of teaching reform in College English listening course, with a view to achieving high quality teaching in College English listening course.

Keywords: OBE concept; Internet plus; English listening; Teaching reform; University

1. INTRODUCTION

In the new round of educational system reform, China emphasizes that the transformation of traditional education development mode to Internet plus education development mode will be a new normal for future education development under the background of "Internet plus". At present, looking at the current situation of College English Listening Teaching in China, the problems of College English teachers' teaching effect is not ideal, students' learning efficiency is low, and teaching methods are outdated. Based on the Internet plus, the new teaching reform in China has put forward the reform and innovation of College English listening teaching. Under the OBE concept, the teaching system of Internet plus College English listening course is bound to be an open, collaborative and integrated development process. The integration of the new Internet products and OBE concept is a catalyst for the dual listening teaching. It needs to fundamentally change the teaching framework of English listening course, innovate the teaching mode of English

listening course, and build a new teaching ecosystem of Internet plus English Listening Based on the concept of OBE. Under the OBE concept, the teaching reform of English Listening Course Based on Internet plus requires us to reconsider the current teaching situation of College English listening course, analyze the connotation of Internet plus English listening teaching and OBE concept, and explore new teaching paths in the new teaching ecosystem of English listening course [1-3].

2. OBE CONCEPT AND CONNOTATION OF INTERNET PLUS ENGLISH LISTENING COURSE

2.1 OBE concept

OBE is an educational model based on learning output. OBE is a result oriented concept, which was first born in the basic education reform in the United States and Australia. In the 1980s, OBE has been a popular educational term in American educational circles. At present, many scholars and experts at home and abroad have different opinions on the specific connotation of OBE. In his book "output based education model: Disputes and answers", American scholar SPADI fully expounded the connotation of OBE concept. He believed that OBE realized the transformation of education paradigm, and clearly focused and organized the education system, so that the educated could obtain substantial and successful experience in future life. The Western Australian Department of education defines the concept of OBE as an educational process based on the realization of students' specific learning output. Under this important connotation, educational structure and curriculum are regarded as educational means rather than educational purposes. Many education experts in China believe that the real connotation of OBE is to strengthen students' learning achievements, and all educational means of educators serve for educational goals. Although there are many definitions, it is not difficult to find that the connotation interpretation of OBE concept has the same characteristics, that is to emphasize that educators must have a clear idea of students' final learning achievements, and carry out appropriate teaching design according to the preset goals of students' learning achievements. From the perspective of teaching reform, OBE education model can be regarded as an innovation of education paradigm.

2.2 Internet plus English Listening Teaching

Internet plus is the product of the development of information technology. It is a new development form of the traditional Internet and a further embodiment of Internet thinking in real life. Popularly speaking, "Internet plus" refers to the "Internet plus all traditional industries",

but it does not mean that they are simply added together. Instead, it emphasizes the use of information technology and Internet platform to achieve a high degree of integration with traditional industries, thus creating a new development ecosystem. Therefore, the important connotation of "Internet plus English Listening Teaching" lies in the cross boundary integration of Internet resources and English listening curriculum resources, which makes the English Listening Teaching ecosystem change qualitatively and produce a completely new teaching form. Under the background of the new era, the Internet plays an important role in optimizing and integrating the teaching ecology of College English listening course. Integrating the innovative achievements of the Internet into the teaching ecology of English listening course can give new vitality to English listening teaching and enhance the creativity of English listening teaching. Under the Internet plus education background of OBE concept, the new technological products based on big data provide sufficient resources support for the teaching of College English listening course. Further integration of information technology and English listening teaching will strengthen the teaching ecology structure of English listening course and create a new growth point of English Listening Course Teaching [2]. China pointed out in the world Internet Conference as early as the world Internet is a new tool for the development of education industry, and Internet plus education will gradually become a new normal education in the future. Therefore, the teaching reform of Internet listening based on Internet plus OBE concept is not only the need for highly integration of Internet and College English education, but also the trend of China's higher education reform.

3. TEACHING REFORM SIGNIFICANCE OF INTERNET PLUS ENGLISH LISTENING COURSE UNDER OBE CONCEPT

3.1 Requirements of national education reform

Under the background of the new era, with the continuous development of China's education, the university education system is gradually improved. Under the background of "Internet plus", training college students' English listening ability has always been the main thread of College English teaching, and is also an important index to assess the quality of English teachers' teaching. Since the beginning of the 21st century, with the rapid development of the Internet, new Internet products are constantly emerging. The emerging information technology has brought serious impact on the traditional English listening teaching, but also brought new opportunities for the teaching of College English listening course, pointing out the new direction of teaching reform. China pointed out in the world Internet Conference as early as the world Internet is a new tool for the development of education industry, and Internet plus education will gradually become a new normal education in the future. In recent years, China has been committed to the research of new normal development of Internet plus education, and emphasized the importance of Internet plus education and the necessity of College English teaching reform in the new round of higher education

reform. [3-10] Therefore, College English as the main body of training national compound talents, only following the development of Internet plus, integrating OBE concept into the teaching of College English listening course, innovating the teaching mode of English listening course and constructing a new teaching ecological framework, can we better fit the new trend of education development and implement the relevant requirements of national education reform. To effectively train successors and builders of socialism in China.

3.2 The need of English teaching development

Colleges and universities are the forefront of cultivating applied talents in China. College English is the main subject to cultivate college students' comprehensive language quality and professional ability. At present, with the multi-dimensional development of College English Teaching in China, the importance of English listening teaching has become increasingly prominent. With the improvement of China's comprehensive national strength, the demand for foreign language professionals is increasing day by day. Cultivating college students' English listening ability is of great strategic significance to promote China's social development. Under the background of "Internet plus", facing the requirements of national education reform and the demand of compound professional talents, the teaching reform of College English listening course is urgent. Only by strengthening the main line of education, fully integrating the OBE concept into the teaching of College English listening course, and by virtue of the advantages of the Internet, can the teaching mode of English listening course meet the learning needs of Chinese college students be developed, so as to promote the understanding and absorption of students' English knowledge and strengthen their English listening learning achievements [4]. The only way which must be passed is to reform the teaching of English Listening Based on Internet plus OBE under the concept of Internet. On the one hand, it is the only way to cultivate foreign language professionals in China. On the other hand, it is also the inherent need of the development of College English teaching itself.

4. THE PROBLEMS EXISTING IN THE TEACHING OF COLLEGE ENGLISH LISTENING COURSE UNDER THE OBE CONCEPT

4.1 Limited teaching tools for English Listening Course

Under the concept of OBE, although the teaching of College English listening course has gradually changed from "focus on subjects" to "focus on people", it emphasizes students' learning outcomes and adheres to the guidance of students' learning outcomes. However, in practice, most college English teachers are still constrained by teaching tools, which makes the OBE concept not fully integrated into the teaching of College English listening course, which is not conducive to the release of the value function of OBE concept. The constraints of English listening teaching tools directly lead to the obsolescence and backwardness of English listening teaching mode, which is mainly reflected in the limitation of teachers' teaching tools. First of all, subjective factors, some English teachers lack of strong information literacy,

can not effectively use the campus Internet equipment to carry out English listening teaching. Most English teachers still use the traditional teaching method of full classroom, and they have no clear understanding of the online + offline education mode, and they are not used to the online + offline mixed teaching mode [5]. Secondly, on the objective factors, some schools lack relevant internet teaching facilities, and do not build new internet teaching platforms according to the development of the Internet plus education. Due to the influence of a series of factors, the teaching mode of English Listening Course for College English teachers is out of date and old-fashioned, which can not carry out the concept of OBE in the end, which affects the final learning effect of college students.

4.2 Decoupling of teaching ideas of English Listening Course

From the perspective of pedagogy, OBE concept is essentially different from traditional education concept. The subject of OBE lies in students, and the starting point lies in the final results of education. The traditional education is bound by the education thought, although it also emphasizes the education of students, but it is often interfered by the factors of education content or education investment, which causes educators to pay attention to the teaching process and ignore the teaching results. Under the concept of OBE, on the one hand, English Listening Course Teaching in Colleges and universities in China emphasizes the importance of students' learning achievements, on the other hand, it is bound by traditional education ideas, which leads to the incomplete implementation of OBE concept. First of all, from the perspective of classroom teaching, the implementation of OBE is still not enough. Secondly, from the perspective of the realization of learning output, the current college English listening teaching still focuses on simple reading comprehension and comprehensive language learning. The extensive listening content can not effectively distinguish College English from middle school English, professional English and public English, and the content of English is divorced from students' major to a certain extent, which is not conducive to college English teaching. The integration of industry and discipline affects the efficiency of OBE concept [6]. Finally, in the evaluation and measurement of learning output, the current test of College English listening teaching results is still carried out in the form of test paper. The single assessment method of learning output is out of touch with the OBE concept, resulting in the limitation of the effectiveness of OBE concept.

5. OBE CONCEPT BASED ON INTERNET PLUS ENGLISH LISTENING CURRICULUM TEACHING REFORM PATH

5.1 Optimize the overall teaching objectives of English Listening Course

To upgrade teaching, the goal should be first. From the perspective of pedagogy, the design of English listening teaching objectives is directly related to the implementation of English listening teaching. Scientific teaching goal is the premise of efficient implementation of teaching plan, and also the basic guarantee of teaching

results. The design of College English listening teaching objectives should adhere to the cultivation of students' English listening ability as the basis, integrate various factors that affect English listening teaching, and fully integrate the OBE concept into the overall objective design of English listening teaching. Under the OBE concept, the design of the general goal of English listening teaching should also build a basic framework for "Internet plus English Listening Course". Therefore, the design of the general goal of College English listening course, the OBE principle is the basic principle of target design. "Internet plus" is an important tool for the design of the general goal of English listening course. They are mutually complementary and closely related. Only by integrating the two fully, can the teaching goal of English listening course be designed more scientifically, humanized and feasible. Based on this, the design of the general goal of Internet plus English Listening Course under the OBE concept should focus on two important teaching ecological factors and [7]. First of all, the implementation and integration of OBE concept in the teaching objectives of English listening course, English teachers should emphasize: what kind of learning results do teachers want students to achieve? Why should teachers let students achieve such learning results? How can teachers effectively help students achieve these learning outcomes? How do we know that students have achieved these learning outcomes? Only by clarifying the meaning of OBE concept can English teaching design more scientific teaching objectives. Secondly, the design of "Internet plus English Listening Course" should be fully integrated into the teaching tools of the internet teaching tool, and the internet teaching tools can be subdivided, and the corresponding English listening teaching resources can be fully excavated according to the Internet, so that the advantages of the Internet can be seen in the teaching of English listening courses, and the teaching of English listening course can be further boosted.

5.2 Constructing a new teaching mode of English Listening Course

The design of teaching objectives of English listening course is the premise of the implementation of OBE concept, and the construction of new teaching mode of English listening course is the whole process of English listening course teaching. Therefore, the construction of innovative and rich new teaching mode of English listening course is essentially an effective re planning of the implementation process of English listening teaching objectives, making the implementation of English listening teaching activities more scientific and efficient. First of all, the construction of the new teaching mode of English listening course should start with the reconstruction of teaching concept. The traditional teaching mode of English listening course is mostly classroom teaching. English teachers generally believe that classroom is the only place to carry out listening course teaching, and textbooks are the main content of Listening Course Teaching [8]. Therefore, from the perspective of teaching reform and upgrading, English teachers' outdated English listening teaching concept has

bound the innovation of teaching mode. Therefore, English teachers should break the traditional teaching concept, fully realize the value function of Internet plus English listening teaching, and also clarify the connotation of English Listening Teaching under the OBE concept. Secondly, the innovation of the new teaching mode of English listening course should start from optimizing the teaching resources and reshaping the teaching tools. At this stage, with the continuous integration of Internet products and education industry, new teaching mode has been gradually developed and applied. Based on this, teachers should actively use classroom Internet equipment, realize the important role of multimedia teaching equipment, and integrate the concept of OBE into the design of multimedia courseware to further demonstrate the effectiveness of English listening class. In terms of schools, it is necessary to build a perfect network teaching platform for English teachers, promote the use of more high-end Internet Education Platform in the market, fully carry out online + offline hybrid English listening teaching mode, refine listening courses, and strengthen students' cooperative learning, so as to make students' English Listening Training more abundant in content and more free in methods. Finally, the construction of the new teaching mode of English listening course should start from standardizing the teaching process. For the teaching of English listening course, the teaching mode is not immutable. English teachers should teach students in accordance with their aptitude, suit measures to local conditions, and scientifically and reasonably choose the appropriate teaching mode according to students' learning characteristics [9]. In this regard, English teachers are required to strictly implement the teaching objectives of OBE concept and develop more teaching paths of English listening course with the help of Internet. For example, according to the course content and students' learning needs, English teachers carry out flipped classroom, group interaction, inquiry learning, online classroom and other learning modes with the help of Internet equipment. Through the construction of the new teaching mode, effective planning of English listening teaching process, making full use of the advantages of the Internet, the OBE concept is integrated into it to achieve the purpose of high-quality English listening teaching.

5.3 Innovating the teaching evaluation mechanism of English Listening Course

The design of the overall goal of English listening course teaching is the premise, the construction of the new teaching mode is the specification of the implementation process, and the innovation and improvement of the teaching evaluation mechanism of English listening course is the test and improvement of the teaching results. Starting from the OBE concept, the establishment of the teaching evaluation mechanism of English listening course is an indispensable link in English listening teaching, and also the only key step to correctly test the students' learning achievements under the OBE concept. In this regard, the establishment of the teaching evaluation mechanism of English listening course should make full use of the advantages of the Internet, integrate the OBE

concept into the teaching evaluation system, and carry out the teaching evaluation of English listening course from the two aspects of students' learning achievements and teachers' teaching quality. First of all, in terms of students' learning achievements, English teachers should adjust the original teaching evaluation mechanism according to the OBE concept, and establish a teaching evaluation system in line with students' learning characteristics and OBE concept. As one of the main ways to evaluate the teaching quality of teachers, the test of students' learning achievements should open up a new inspection channel on the original test mode and break the shackles of the traditional test paper mode. For example, English teachers rely on Internet equipment to establish online learning achievement assessment content, and deeply test students' learning achievements through video, audio, student interaction and other modes. By widening the channels of learning achievement test, it is convenient for English teachers to obtain more teaching evaluation contents with reference value, so as to continuously improve English listening teaching methods and realize high-quality English Listening Teaching [10]. Secondly, the evaluation of teachers' teaching quality not only depends on the test of students' learning achievements, but also needs to enrich the classroom teaching evaluation system. According to the concept of OBE, English teachers innovate teaching evaluation methods, such as: English teachers make anonymous online voting Q & A through information technology, teachers let students upload self-learning evaluation and teacher teaching evaluation timely through the network platform after each English listening course. Through the evaluation of teaching quality and the test of students' learning achievements, we can fully demonstrate the effectiveness of OBE concept, provide valuable reference for English teachers' teaching upgrading and reform, and constantly improve the teaching quality of English listening course.

6. CONCLUSION

To sum up, under the environment of Internet plus, it is of great significance to enhance the integration of information technology products, OBE concepts and English listening teaching to improve college students' English application ability and listening ability. The reform and implementation of the Internet plus English Listening Course under the concept of OBE is not only the requirement of the national higher education reform, but also the internal demand of English professional curriculum teaching self transformation. Under the connotation of OBE and Internet plus English listening course, we have analyzed the significance and problems of the Internet plus English Listening Course Teaching under the concept of OBE, and analyzed the problems of English listening teaching, and optimized the teaching objectives of English listening course, set up a new teaching mode of English listening course, and innovating the teaching evaluation mechanism of English listening course. Upgrading, better training of foreign language professionals in China.

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Research on Guangxi's Participation in the Development of New Western Land-Sea Corridor

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Abstract: The development of New Land-Sea Corridor in western China is upgraded to be a national strategy following the approval of the State Council in August 2019. Aiming in strengthen international cooperation in economic and trade between neighboring countries and western China's provinces, the construction of the Corridor will carry out further development and integration in transportation, logistics, trade and industry. The essay begins with introduction about the existing situation of the Corridor, then analyzes the arising challenges in Guangxi's participation in the development of the Corridor, and ends by suggestions including developing talent science & technology and also the real economy; implementing industry differentiation and product high-ending; and strengthening the cooperation between Beibu Gulf and The Guangdong-Hong Kong-Macao Greater Bay Area.

Keywords: Guangxi; Corridor construction; Development strategy

1. INTRODUCTION

In August 2019, the National Development and Reform Commission of China issued a notice on the "Master Plan for the New Western Land-Sea Corridor", and the New Western Land-Sea Corridor was officially approved by the State Council of China and upgraded to a national strategy. The new western land-sea corridor is located in the hinterland of western China. It connects with the Silk Road Economic Belt in the north and the 21st Century Maritime Silk Road in the south. It connects with the Yangtze River Economic Belt and has an important strategic position in the coordinated regional development pattern. The new western land-sea corridor originated from the China-Singapore (Chongqing) Interconnection Southbound Channel Project, which was launched in 2017. In November 2018, the southbound channel was renamed "New International Land-Sea Trade Channel" and later renamed "New Western Land-Sea Corridor". The goal of the project is also to make up for shortcomings in transportation capacity in the early stage, release market potential, and upgrade to a complex trade logistics channel that deepens international economic and trade cooperation between provinces, autonomous regions, and neighboring countries in western China, and promotes the deep integration of transportation, logistics, commerce and industry. In the current reality that China's western region is not well-opened and has various internal developments, it has become an urgent task to speed up the establishment of a new international land-sea corridor that truly connects

the western inland and all parts of the world[1-11].

2. THE EXISTING SITUATION OF THE NEW LAND-SEA CORRIDOR IN WESTERN CHINA

2.1 Industry Development In Provinces Along the Corridor

As far as the regional GDP and growth rate of the new western land-sea corridor are concerned (see Figure 1), the economic development of the provinces and cities radiated by the new western land-sea corridor is showing a good momentum and the economic development vitality is remarkable, providing a good hinterland for the development of the new western land-sea corridor Economic environment. Among them, Guizhou and Yunnan are quite eye-catching. The GDP growth rate in 2019 is among the top three in the country. However, the economic development of the provinces and cities radiated by the new western land-sea corridor is obviously different. Sichuan Province, the highest and the lowest, has a GDP difference of 3.8 trillion yuan in 2019. The development space and potential are huge.

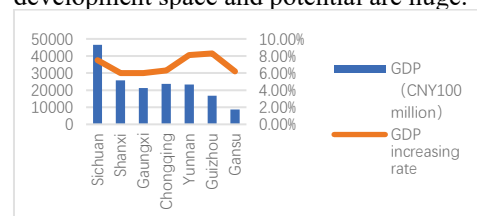


Figure 1: The GDP of the provinces, cities and regions mainly radiated by the new western land-sea corridor in 2019

2.2 Industrial Structure Of The New Land-Sea Corridor Of Western China

2.2.1 Industrial Structure Of Provinces Along The Corridor

Through comparative analysis of the three industrial structures of various provinces and cities, the major cities radiated by the new western land-sea corridor can be divided into two levels. The first level is Shaanxi and Chongqing, which have a high degree of industrialization; the second level is Guizhou, Guangxi, Yunnan, Gansu and Sichuan, which have a certain industrial foundation and agriculture accounts for a large economic total. In 2019, the three industrial structures of the new western land-sea corridor in the main domestic radiation areas are shown in Table 1.

2.2.2 Industrial structure of ASEAN countries

Due to the different levels of factor endowments and economic development, the distribution of advantageous industries in ASEAN countries is not the same. On the

whole, ASEAN presents a geographical distribution of "rich in the south and poor in the north". According to the level of economic development and the distribution of advantageous industries, the ten ASEAN countries can be roughly divided into 4 different levels.

The first level is Singapore, a new industrial country. Singapore has entered the late stage of industrialization,

Table 1: Proportion of Agriculture, Industry And Service in provinces along the Corridor in 2019

	Sichuan	Shanxi	Guangxi	Chongqing	Yunnan	Guizhou	Gansu
Agriculture	10.3%	7.7%	16.0%	6.6%	13.1%	13.6%	12.0%
Industry	37.3%	46.5%	33.3%	40.2%	34.3%	36.1%	32.8%
Service	52.4%	45.8%	50.7%	53.2%	52.6%	50.3%	55.1%

The second level is middle-industrialized countries, including Malaysia, Thailand, Indonesia and the Philippines. Malaysia is rich in natural resources. Advantageous industries include not only resource-intensive industries such as plants and minerals, but also capital and technology-intensive industries such as plastics, rubber, copper and its products, electrical equipment, and precision instruments. Thailand has comparative advantages in resource-intensive industries such as plant products and food, as well as capital-intensive industries such as plastics, rubber products, and machinery and equipment. The Philippines and Indonesia are rich in natural resources. They have advantages in resource-intensive and labor-intensive industries such as plant products, food, textiles, and footwear. They also have relatively strong competitiveness in capital-intensive industries such as motors and machinery.

The third level is countries with a certain industrial foundation, such as Vietnam. Vietnam is a traditional agricultural country. Its dominant industries are resource-intensive industries such as animal and plant products, and labor-intensive industries such as wood products, leather products, textiles, footwear, and furniture. It has a relatively strong competitive advantage in motors and electrical equipment.

The fourth level is the less developed agricultural countries, such as Cambodia, Myanmar, Laos, and the resource-intensive country Brunei.

2.2.3 Industry Complementarity In The Corridor Radiation Area

The new western land-sea corridor has diverse industrial structures at home and abroad, with different levels of industrial development and distinctive advantageous industries, and strong industrial complementarity, which has broad development space.

There is strong industry complementarity between provinces and cities along the domestic route. From the perspective of the industrial complementarity of the major domestic provinces and cities in the new western land-sea corridor, the industrial structures of the seven provinces and cities mentioned above are quite different, and the dominant pillar industries are also quite different. Chongqing, Sichuan and Shanxi, which are located in the radiation area of the northern part of the corridor, are highly industrialized; Guangxi, Guizhou and Yunnan in the radiation area of the southern part of the corridor and Gansu in the north are roughly in the middle stage of

and its industry will transform into an innovation-intensive industry in the next step. Singapore's advantageous industries mainly include capital and technology-intensive industries such as chemicals, plastic products, machinery and electrical equipment, and precision instruments.

industrialization, and trade products are mainly traditional industrial products and agricultural products. Therefore, there is obvious industrial complementarity between the north and south areas radiated by the corridor, and there is a strong demand for freight transport for the new western land-sea corridor.

2.2.4 Complementarity between The Corridor Radiation Area and ASEN countries

From the perspective of the industrial complementarity between domestic key radiation areas and Southeast Asia, Chongqing, Sichuan, and Shanxi, which are in the first tier in China, have strong industrial complementarity with Southeast Asian countries in the second, third, and fourth tiers. The country exports high-tech products, while importing traditional industrial products and agricultural and sideline products. At the same time, although Chongqing, Sichuan, Shanxi and Singapore all have new industrial foundations and advantages, they still have certain differences in sub-industries. Channels to tap the market. Guangxi, Guizhou, Yunnan, and Gansu at the second level, and Singapore at the first level, Vietnam, Cambodia, Laos, Myanmar, and Brunei at the third and fourth levels are highly complementary in industry. There are more trade exchanges and transportation needs. Guangxi, Guizhou, Yunnan, and Gansu are similar and competitive with the second-tier Thailand, Malaysia, Indonesia, and the Philippines in terms of industries. They can also conduct horizontal intra-industry trade and have certain transportation needs.

2.3 Import And Export Of Provinces Along The Corridor

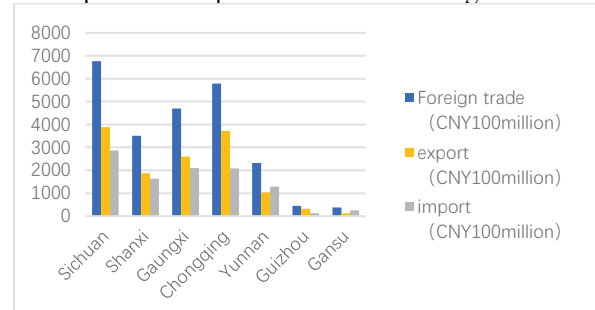


Figure 2: The total import and export volume of the new western land-sea corridor in 2019

According to customs data, the import and export trade of domestic provinces and cities mainly radiated by the new western land-sea corridor has increased significantly. In 2019, Sichuan ranked first in terms of total import and

export volume, followed by Chongqing, Guangxi, Shanxi, Yunnan, Guizhou and Gansu (as shown in Figure 2).). Among them, Sichuan Province ranks among the top ten in the country with a total import and export volume of 676.59 billion yuan.

3. CHALLENGES ARISING IN GUANGXI'S PARTICIPATION IN THE DEVELOPMENT OF THE CORRIDOR

3.1 Industry Unbalance Limits Export-Oriented Economy

On the one hand, due to the lack of competing concepts and the division of administrative divisions in the provinces along the "New Western Land-Sea Corridor", there is a phenomenon of convergence of leading industries in the process of co-building the logistics system of the "New Western Land-Sea Corridor". In the past three years, the leading industries of provinces and regions along the "New Western Land-Sea Corridor" are still mainly concentrated in traditional fields such as agriculture, forestry, animal husbandry and fishery, wholesale and retail, and mineral resource mining and processing; emerging industries such as electronic information and big data have some in Chongqing and Guizhou. Outside of the scale, other provinces and autonomous regions account for a smaller proportion, and some provinces and autonomous regions can even be ignored. The convergence of industries has caused the "Prisoner's Dilemma" phenomenon in economics to appear in the provinces and regions along the "New Western Land-Sea Corridor", which has severely affected the quality and level of competition and cooperation in the provinces along the line, and restricted the overall foreign trade of the "New Western Land-Sea Corridor" Capacity and logistics capacity development. On the other hand, as measured by the ownership structure, the provinces and regions along the "New Western Land-Sea Corridor" are underdeveloped regions. Due to the influence of the traditional planning system and resource endowment, the private economy accounts for a small proportion of the industry. In 2019, Guangxi's state-owned (including state-controlled) enterprises realized industrial added value accounting for more than 40% of the industrial added value above designated size in the region, and Qinghai's private economy realized added value accounting for less than 30% of the province's GDP. Compared with the eastern developed provinces, the local governments of the provinces along the "New Western Land-Sea Corridor" have strong control over resources, and the degree of marketization of the channel economy is relatively low.

At the same time, the development of export-oriented marine economy is restricted by talents and technology. First, the overall quality of human resources is not high enough to meet the requirements of export-oriented marine economic development. Guangxi and western China have a large population with a fast population growth rate, a low level of education, and a small population of professional and technical training. The development of the export-oriented marine economy has a great demand for human resources. However, because the local supply is mainly cheap labor, the overall quality of talents is not high, which hinders the development of

the export-oriented marine economy to a certain extent. Second, backward science and technology and insufficient funds for technological development cannot provide strong support for the export-oriented marine economy. The development of an export-oriented marine economy requires a high level of technology, a large demand for capital supply, a lack of advanced production equipment, and certain obstacles to the development of patented technologies and the introduction of advanced technologies, which restrict the development of the export-oriented marine economy.

3.2 Absent of Services In Information Sharing Lead To Cross-Regional Collaboration obstacle

Although the information system of China's customs department is sound and powerful, the information systems of the customs and railways, transportation management, ports and other units cannot be interconnected. The entire customs clearance process of the enterprise is not intelligent, and it even increases the customs clearance cost of the enterprise. For example, many companies in Guangxi have proposed that if the record information is incorrect, the vehicle cannot be imported or exported. If you want to modify the record, you must contact the original record company and the record customs for modification. If the original company cannot be contacted, The car cannot be modified, which is time-consuming and laborious. The company hopes to be able to file for the record once and be used nationwide to improve the inspection and release efficiency of bayonet vehicles. Another example is that a company in Chongqing proposed that before the cargoes of the "New Western Land-Sea Corridor" depart from Qinzhou, they need to manually enter the arrival report before declaring the pre-allocation manifest. Companies hope to be able to automatically generate arrival reports when containers enter the port, and automatically transmit them to customs and other regulatory authorities to reduce customs clearance costs and improve work efficiency. In addition, the lack of information sharing and communication is also reflected in aspects such as cross-border transportation, resulting in poor road access, repeated inspections of goods, and multiple inspections.

3.3 Weakly Regional Agglomeration Decline The Ability Of Absorption, Integration And Transformation

Urban agglomeration is a collection of cities composed of central cities as the core and radiating to surrounding areas. Among them, large, medium and small cities can rely on each other and develop together. According to the theory of regional development, industrial agglomeration, population concentration and urban agglomeration development are the three main lines of regional agglomeration development. The development of regional agglomeration is an important foundation for the development of urban agglomerations, such as Hong Kong, Macau, Guangzhou, Shenzhen in the Pearl River Delta, and Shanghai in the Yangtze River Delta. As central cities, they have contributed to the development of industries, population and urbanization in their respective urban agglomerations. Obvious agglomeration and driving effect. For Guangxi, the new western land-sea

corridor is led by the Beibu Gulf city cluster. Among the Guangxi Beibu Gulf city clusters, Nanning has a higher level of development than other cities, but its agglomeration capacity is still lacking and the economic driving effect is not obvious.

First of all, the urban agglomeration has not fully utilized the preferential policies and measures given by the national government. The localities have not formed a joint force and have not truly integrated the effect of multiple preferential policies. Secondly, the urban agglomeration has its own superior location and abundant resources, which is not only conducive to learning the advanced experience of the surrounding areas, but also able to use the advantages of coastal and border exchanges and cooperation with neighboring countries to develop the economy to the sea, but the urban agglomeration has not been realistically implemented. Relying on the ocean, merge existing advantages into competitive advantages. Except for Nanning as a second-tier city, the cities in this urban agglomeration are all fourth- and fifth-tier cities. The ability to learn, integrate and innovate should also be strengthened. Thirdly, there are enterprises, universities, and scientific research institutes in this city group, but the functional positioning of different links in the cooperation chain is not clear enough, and the strength of combining industry, university, research and application is still relatively weak, and the ability to stimulate the innovation passion and vitality of the corresponding subjects is also urgently needed. The promotion restricts the further development of this urban agglomeration.

3.4 Lack Of Financial Support In The Development Of The Corridor

One is the lack of risk compensation mechanisms. Guangxi is a post-developed region and border region. The channel effect of undertaking the opening up and development of southwest, central and southern China has not been fully realized. The own cash flow of some major transportation and logistics infrastructure projects in the new western land-sea corridor is not enough to cover the principal and interest of financial institution loans. It is difficult to construct a credit loan model that meets the requirements.

The second is the lack of special investment funds. Infrastructure construction occupies an important position in the construction of the new western land-sea corridor. These projects generally have the characteristics of long cycle and low investment income. They need the government to set up special investment funds to support. Guangxi is currently lacking in this aspect.

4. SUGGESTIONS FOR GUANGXI'S PARTICIPATION IN THE COMING DEVELOPMENT OF THE CORRIDOR

4.1 Strengthening Development Of Talent Science & Technology And The Real Economy

The construction of the New Western Land-Sea Corridor is a key channel to promote coordinated regional development and activate the development momentum of the west in the new era. As far as Guangxi is concerned, efforts should be made to strengthen the integration of the construction of new corridors and the development of the

real economy, combined with the actual construction of the New Western Land-Sea Corridor and the need to deepen the expansion of cooperation space, and actively promote the construction of the Western Talent Passage and the Western Science and Technology Innovation Passage. Promote in-depth cooperation with colleges and universities in central western cities, and coordinate the support of the development of "corridor + real economy", "corridor + talents", and "corridor + science and technology", beyond the construction of general logistics channels.

In order to promote the construction of the New Western Land-Sea Corridor in Guangxi, it is necessary to fully summarize the experience and shortcomings of the construction of the southwest sea channel. The construction of the southwest sea channel has laid the foundation for the construction of the western land-sea channel, but due to the relatively weak economy of the hinterland, the coverage area is not wide enough and the regional functions are limited. The strategic positioning of the company has inherent shortcomings in development. The construction of the New Western Land-Sea Corridor has brought historic opportunities for Guangxi's opening and cooperation, and has provided new strategic options for the development of the western region. For Guangxi, in order to make the New Western Land-Sea Corridor stronger and stronger, it must get rid of and surpass the construction of functional logistics channels. The development of the real economy must be combined with the full flow of various elements such as talents, technology, and information, and the channel construction must be built. Organically integrated with the "United with the North" strategy. On the whole, relying on the construction of new land-sea corridors in the west and strengthening in-depth cooperation with central cities in the west are important strategic options for Guangxi to fill talent shortcomings, break through innovation bottlenecks, and build cooperation platforms.

4.2 Increasing Financial Support

One is to establish a reasonable risk compensation mechanism. The second is to set up a special construction fund for the New Western Land-Sea Corridor to strive for financial support. Through the establishment of a special fund for the New Western Land-Sea Corridor through finance, social funds can be invested in the construction of the New Western Land-Sea Corridor. Accelerate the operation of the Guangxi-ASEAN "One Belt One Road" fund and support the construction of the New Western Land-Sea Corridor. The third is to promote the implementation of the operation compensation mechanism. For projects such as intercity railways and expressways, it is recommended that the autonomous region speed up the implementation of the operating loss compensation mechanism, and formulate relevant systems and management methods to break some intercity railways and expressways, which generally have less passenger flow and longer market cultivation periods. The bottleneck, thus speeding up the construction of key infrastructures for the New Western Land-Sea Corridor, and also setting a model for other similar types of railways

and expressways in financing.

4.3 Implementing Industry Differentiation And Product High-Ending

On the one hand, the provinces and autonomous regions along the "New Western Land-Sea Corridor" should firmly grasp the leader of the channel economy to drive the development of local characteristic and advantageous industries, continue to increase support for the characteristic and advantageous industries of the provinces and regions along the route, and issue the "New Western Land-Sea Corridor" "Encouraged Industries Catalog", implement relevant preferential policies such as corporate income tax reduction and exemption Promote the construction of national clean energy, deep processing of agricultural products, intelligent equipment manufacturing, and strategic emerging industrial bases in provinces and regions along the "New Western Land-Sea Corridor", especially new industries and new business types represented by big data, big health, big tourism, and big logistics Develop and expand the proportion of mid-to-high-end industry/product exports.

On the other hand, the provinces and regions along the "New Western Land-Sea Corridor" should also actively explore industries that have strong demand from countries and regions with the "New Land-Sea Corridor" accessible to countries and regions such as ASEAN, Central Asia, and Europe. Meeting their needs can also optimize the export commodity structure of provinces along the route and achieve mutually beneficial and win-win development. In addition, it is also a systematic project to comprehensively enhance the vitality of the private economy and vigorously promote the high-quality development of the private economy. It is worth noting that under the new normal of economic development, the scale of emerging industries is still small, which is not enough to fill the gap left by the slowdown in the growth of traditional industries. The provinces and regions along the "New Western Land-Sea Corridor" must realize the logistics industry The export of foreign trade-oriented industries/products within the country is growing steadily and rapidly, and the conversion of new and old momentum needs to be further accelerated.

4.4 Developing A Standard Data Information Collecting System To Serve The Corridor

We must follow the trend and be guided by technology-led development, tap big data resources, build information platforms, and accelerate the construction of smart customs; use information sharing as the starting point to promote mutual recognition of customs supervision and mutual assistance in law enforcement, and continuously promote the modernization of customs governance systems and governance capabilities , To promote trade security and convenience in the new channel.

The rapid development of the "New Land and Sea Corridor" cannot do without the support of powerful information resources. However, with the advent of the information age, information and data are becoming more and more complex. How to extract useful data from the explosive information data to support the "New Land and Sea Corridor" The development and growth of "channels"

is an unavoidable problem. Through investigations, many companies have reported that, at present, the "New Land-Sea Corridor" has different data collection standards and calibers, and there are problems such as repeated collection, multi-head collection, and data shortage. It is urgent to establish a standard data information collection system. For this reason, it is recommended to take national trade exchanges as the main line, based on enterprise customs clearance data, and from the General Administration of Customs level, relying on advanced technologies such as "Big Smart Cloud Things" to give full play to the "5G" high connection number, low latency, high reliability and The advantages of low power consumption have promoted the establishment of a set of standard data information collection systems including the "China-Europe Express" and "New Land and Sea Corridor" to realize the intelligent collection of basic information such as logistics, finance and even infrastructure construction. Support the rapid development of the "New Land-Sea Corridor" and provide standard basic data support.

4.5 Promoting the Cooperation Between Beibu Gulf and the Guangdong-Hong Kong-Macao Greater Bay Area

The Beibu Bay Greater Bay Area is adjacent to the Guangdong-Hong Kong-Macao Greater Bay Area in the east. It should take the initiative to take advantage of the radiation influence of the Guangdong-Hong Kong-Macao Greater Bay Area to strengthen cooperation with the Guangdong-Hong Kong-Macao Greater Bay Area. Mainly highlight two aspects: First, the Beibu Bay Greater Bay Area has sufficient land resources. It should take the initiative to undertake the transfer of labor-intensive industries and emerging industries in Guangdong, Hong Kong and Macau, inject new vitality into economic development, and drive the Beibu Bay Area economy , Improve the overall quality of society and population. Second, further improve the construction of the Beibu Gulf Greater Bay Area's transportation network, improve the road, rail, and maritime transportation network that connects with the Guangdong-Hong Kong-Macao Greater Bay Area, improve the level of roads, and increase the internal highway, railway, and air transportation lines in the Beibu Gulf Region The density and coverage of the two bays provide channel protection for economic activities between the two bays, promote the integration of Guangxi and western China into the development of the Guangdong-Hong Kong-Macao Greater Bay Area, and realize the joint development of the export-oriented marine economic belt of the "New Land-Sea Corridor" and the economy of the Guangdong-Hong Kong-Macao Bay Area.

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"Clan Memory" In Architectural Decoration of Ancestral Hall -- Taking Yu's Ancestral Hall in Zhongxie Village as An Example

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Abstract: Based on the field investigation of Yu's ancestral hall in Zhongxie ancient village and the investigation of its architectural decoration, this paper divides the research of Yu's ancestral hall architectural decoration into two parts: the internal "Dao" culture and the external "Qi" culture. From the perspective of human geography, taking Dayu culture and ancestral hall culture as the background, and combining with iconology, this paper discusses the influence of Yu's ancestral hall architectural decoration on traditional culture the inheritance and embodiment of Yu's clan show the style and features of Yu's clan "clan memory" in architectural decoration.

Key words: Ancestral building; Architectural decoration; Clan memory

1. ZHONGXIE ANCIENT VILLAGE AND YU'S ANCESTRAL HALL

Clan is a social organization based on blood relationship and maintained by family etiquette and ethics. The most prominent feature of clan system is the settlement of ethnic groups under the guidance of blood relationship [1]. Zhongxie ancient village is a traditional clan village, and it is the gathering place of the descendants of Dayu. It is said that Yufei and the palace people of Yue, Tang and Song dynasties were mostly buried here, so it is named "Zhongxie". The "Yu family" in the village started from the 37th ancestor of this branch. Zhongxie ancient village is located in the southern mountainous area of Shaoxing, with Shunjiang River in the South and Dalong mountain in the back. It has excellent natural environment and rich cultural landscape.

Clan ancestral hall is mainly used to worship ancestors. As the main place to worship ancestors, it has a strong cultural color of sacrifice. In terms of architectural decoration, it has a more exquisite and beautiful shape and profound connotation. Yushi ancestral hall, the ancestral hall of the ancestral clan in Zhongxie ancient village, was built in the Qianlong period of the Qing Dynasty. It faces south from the north, and consists of two buildings, one in front of the other and the other in the East and the other in the West. The patio has a stage, with a total area of 560 square meters. The ancestral hall as a whole is of wooden frame structure, with green brick walls and horse head walls. It has Xieshan and hard mountain roofs. The roof is made of black tiles. The main hall is built with 22 round blue stone columns. The top of the ancient stage is a roll shed type caisson.

2. THE CULTURAL ORIGIN OF YU'S ANCESTRAL

HALL

2.1 Ancestral hall culture

In the Song Dynasty, the ruler's power of offering sacrifices was transferred down and Zhu Xi's rectification and advocacy of rites made the sacrificial activities gradually tend to be civilian and secularized. As a result, the folk ancestral hall began to be built and the ancestral hall culture also formed. As the main place of worshiping and worshiping ancestors, the cultural connotation of ancestral hall is also inseparable from the sacrificial culture and clan culture.

2.1.1 Sacrificial culture

Sacrifice is originally a kind of belief activity originated from ancient times. The ancestors took the harmonious coexistence of heaven and earth as the concept, prayed for protection and well-being. In the continuous evolution and development, the humanistic nature of sacrifice has been paid more and more attention. In order to maintain the social system and order, the rulers cultivate people's awe of the ritual system and educate people to restrict their behavior with morality and ethics.

2.1.2 Clan culture

Clan culture is based on the clan settlement and linked by blood relationship, which is the reflection of the same cultural psychology and beliefs of a clan. The clan culture of different clans may be different, but in essence, they are all based on the concept of "respecting ancestors", "flourishing clan" and "filial piety", with the intention of promoting the healthy development of the prosperity of the ethnic group. "Prosperous clan", the core of clan civilization is to strengthen the centripetal force and unity of various groups [2], and it is often manifested in encouraging people to take the imperial examination in order to honor their ancestors. The ancestor worship of clan members can be regarded as a kind of clan belief, which also provides an endogenous power for the continuation of clan blood. Filial piety is the core of clan ethics. The so-called "benevolence and filial piety" plays an important role in harmonious family and stable unity.

2.2 Dayu culture

As the ancient sage and founder of the Chinese nation, Dayu is the ancestor of Chinese culture. In history, Dayu played an important role of "Founding Jiuzhou and inheriting the two emperors and the three kings". His deeds of water control, founding the country and delimiting Jiuzhou had a fundamental impact on the origin and development of the nation. Dayu's historical status, national contribution and the spirit of "harmony between

man and nature" and "loyalty, filial piety and respect" embodied in his important deeds are the foundation of Dayu's culture with a long history. The so-called "heaven" of the ancients referred to "nature", which was the core idea of Dayu's flood control [3]. Dayu controlled the flood, placed the interests of the country and the people in the highest position, emphasized loyalty and filial piety, and emphasized integrity. The inheritance of this noble quality had a profound impact on later generations, which fully reflected loyalty, filial piety and integrity.

2.2.1 Sacrifice culture of Dayu nationality

The culture of sacrificing Yu is not only an important part of Dayu culture, but also an important branch of ancestor worship in sacrificial culture. This culture not only has a long history of inheritance, but also has various forms, which can be roughly divided into three kinds of inheritance paths: Official sacrifice, folk sacrifice and ethnic sacrifice. Among them, as an important humanized carrier of Dayu culture, Dayu descendants presided over a comprehensive cultural activity including sacrificial writing, sacrificial dance and other cultural types. It is also a typical sacrificial activity to inherit the ancestors' will and promote the development of the clan.

2.3 Integration of ancestral hall culture and Dayu culture

Cultural integration refers to the process of mutual exclusion, integration and absorption of different cultures in the process of mutual contact, forming a new culture different from the original culture. It is not a simple superposition of different cultures, but a process of brewing, breeding and growth of new culture [4].

Chinese traditional ancestral hall culture and Dayu culture spread independently in the development, which can be used as an important cultural background for the follow-up study of Yu's ancestral hall architectural decoration together with other related and derived cultures. At the same time, the ancestral hall culture and Dayu culture also formed cultural integration in the development. Through seeking common ground while reserving differences in the main spiritual thoughts such as "respecting ancestors and ancestors", "loyalty, filial piety and respect for integrity" and "flourishing the family", the new culture with the core ideas of "Dun Zong and Mu Zu", "admonishment and Enlightenment" and "natural harmony" is refined. The so-called clan memory in the architectural decoration of ancestral hall actually refers to the style and features of this new culture when it exists with architectural decoration as the carrier. It is the "collision trace" between the ancestral hall culture and the clan culture, which is retained in the architectural decoration.

3. "DAO" AND "QI" OF ARCHITECTURAL DECORATION OF YU'S ANCESTRAL HALL

It is recorded in the book of changes: the metaphysical is called Tao, and the metaphysical is called instrument. We can classify the spiritual culture and institutional culture of traditional architecture as "Tao" culture, while the culture of production and life belongs to "Qi" culture [5].

3.1 Explore the "way" of decoration with iconology

"Tao" culture is an abstract high-level culture. In traditional architectural decoration, it can be understood

as the ideology, value, space and life concept attached to traditional architectural decoration. This paper deconstructs the concrete examples of traditional architectural decoration into graphic elements such as pattern, figure, color and symbol, and interprets the "Dao" culture of traditional architectural decoration from the perspective of iconology. Among them, the first level is to explain the natural meaning of the image, that is, to describe what is actually seen. The second level is to discover and explain the traditional meaning of images, that is, to explain some conventional and specific images, stories and themes. In Chinese traditional culture, it is often manifested in the use of homophonic, symbolic, moral and other techniques and the use of historical allusions, myths and legends. The third level is to analyze the symbolic meaning. The cultural characteristics conveyed by the architectural decoration of Yu's ancestral hall can be roughly divided into the following three categories:

3.1.1 Praying for tunzongmu nationality

Since ancient times, Chinese traditional culture has been emphasizing the harmony of phonology, euphemism and implicitness in language use, which has formed a way of expression of praying for good things with homophonic meaning. In the architectural decoration of Yu's ancestral hall, there are bat mouth holding ancient money, which is called "Fu (BAT) in front of you (money)"; Magpie standing on plum blossom branch, which is called "Xi Shang Mei (plum) tip"; egret living in lotus pool, which is called "Yilu (Heron) Lian (Lotus) branch" (as shown in Figure 1). The ancients also used the external forms and characteristics of animals, plants and utensils to connect with abstract concepts. For example, Ganoderma lucidum in the plant patterns used in the architectural decoration of Yu's ancestral hall is considered as auspicious grass and immortal products, symbolizing spirituality and auspiciousness; pomegranate is ruddy in color and full in seeds, symbolizing red fire and many children (as shown in Figure 2). Another kind of design expresses its meaning by means of allegory, mainly through the expression of historical stories, myths and legends, to clarify the truth or abstract concepts. There are many kinds of geometric patterns in the architectural decoration of Yu's ancestral hall, such as "Huiwen", which is connected in positive and negative, and continuous in pairs, implying wealth. The basic purpose of these patterns and figures is to pray for the prosperity and unity of the clan.



Figure 1 wood carving of "yilulianke"

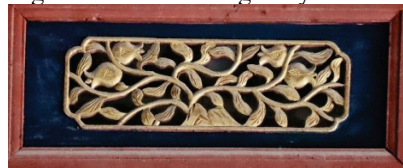


Fig. 2 wood carving of "pomegranate pattern"

3.1.2 Admonishment and education

The admonishment culture in the decoration of Yu's ancestral hall can be divided into moral character education and ritual education. "Three friends in winter", "four gentlemen in flowers" and other plant patterns have positive extended significance because ancient literati like to express their feelings by borrowing things, and often express their noble personality and pursuit of high-level spiritual realm with natural things. Such patterns in architectural decoration to show future generations, play an educational role. For example, chrysanthemums are beautiful but not delicate, and they are born everywhere. They teach the younger generation to be indifferent to fame and wealth, and not to follow the crowd.

3.1.3 Promoting natural harmony

Among the image elements used in the architectural decoration of Yu's ancestral hall, the patterns based on the images of animals and plants account for a large proportion. In addition, plants such as vines, branches and leaves are often used as pure decoration in the corners and partitions of architectural decoration to fill and decorate the blank in the form of twisting or spreading. The extensive use of these animal and plant patterns, whether because of their deeper extended significance or just based on the actual appearance, can reflect from the side that Yu's people have the elegant interest of appreciating nature, and can learn from Dayu's excellent idea of "harmony between man and nature".

3.2 From the perspective of human geography analysis of the decoration of the "device"

The culture of "utensil" is a concrete culture, which is a kind of form. In the traditional architectural decoration, it is embodied in decorative materials, decorative techniques, decorative techniques and so on. It is the materialized form of traditional architectural culture. Shaoxing is located in the hinterland of Jiangnan region, with good ecological environment and abundant mountain forest and water resources. At the same time, there are many craftsmen in Jiangnan area, who are good at carving and decorating buildings with bricks, stones and wood. The ancestral hall of Yu's family in Zhongxie ancient village is light, elegant and elegant in both overall modeling and detailed decoration. Especially in the architectural decoration, the wood carving decoration is rich and exquisite.

In addition, the scale and structure of ancestral hall could not be used as a symbol of architectural order. Yu's ancestral hall is one of the important reasons for the exquisite decoration of Yu's ancestral hall and its prosperity.

4. CONCLUSION

The ancestral hall of Yu family in Zhongxie ancient village can be regarded as the epitome of the development and changes of Yu family in the past few hundred years, and the architectural decoration on it is unique to the clan. Through the research and Discussion on the architectural decoration art of Yu's ancestral hall and its cultural origin, this paper analyzes the characteristics and causes of the internal meaning and external form of architectural decoration, and finds that the architectural decoration of Yu's ancestral hall is the materialized carrier of the integration of ancestral hall culture and Dayu culture. It shows the clan spirit of Yu's ancestral hall in the way of popularization and artistry, and is more close to the public life, which is still of great significance today. The vivid and clear symbolic function has more profound social function besides decorative function. The research on the architectural decoration art of Yu's ancestral hall is not only helpful to the continuation of Yu's clan spirit, but also helps to promote the inheritance and development of relevant traditional art and culture. It can be used as an important source of inspiration and material for contemporary national design in China, which has important value and significance for both the clan and the people.

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Research on Extreme Sports during Adventure Tourism Development in New Zealand

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Abstract: Due to the weakness of traditional tourism and the dependence of modern tourism, it urgently needs to make a study on extreme sports during adventure tourism development, so as to provide a reference for future development of New Zealand tourism. The paper concluded New Zealand tourism elementary development status, analyzed the current situation of extreme sports and discussed some problems during New Zealand adventure tourism development. On this basis, it has proposed some suggestions for adventure tourism development. It should take extreme sports development as the premise and complete relevant laws and regulations; make sufficiently use of extreme sports as the reference, plan scientifically and build future mode for New Zealand tourism.

Key Words: Extreme sports; Adventure tourism development; Future tourism tendency

1. INTRODUCTION

After entering into 21st century, with the development of New Zealand economy and science and technology, extreme sports development has been the development strategy of New Zealand. Extreme sports as the future tourism development point is the frontier market of New Zealand and also the essential component of adventure tourism development. Extreme sports development is one of the hot spots of adventure tourism development. With the deepening of extreme sports and tourism development, New Zealand adventure tourism development is growing rapidly. As the extreme sports is much different than normal sports, we have to study and solve the relevant problem. It is also important to focus on potential development and relevant problems, so that we can make an positive effect on future tourism development [1-15].

2. ELEMENTARY ANALYSIS OF NEW ZEALAND TOURISM

2.1 Universality of local tourism

Just like tourism developed in other places, New Zealand tourism has its own universality. The important two points are the universal development and universal participation. The local tourism has developed for 70 years since its independence and formed its own tourism development system. According to New Zealand tourism board's statistical figures, about 3,700,000 people travel in New Zealand every year and this figure will grow in the nearly future.

2.2 Uniqueness of local environment

New Zealand is an island country located in the southwest Pacific Ocean. Its territory consists mainly of the north island, the south island and some small islands. Most of area has a temperate climate in New Zealand. The Far North has a subtropical climate in summer, while the

inland mountains of the South Island can experience temperatures as low as -10°C in winter. New Zealand is home to spectacular glaciers, magnificent fjords, rugged peaks, vast plains, high and low mountains, tropical jungles, volcanic uplands, and miles of sandy beaches.

In addition, New Zealand is a mix of indigenous Māori, European, Pacific and Asian history and culture. Making it a melting pot for many ethnic groups around the world, but there are also many common features that make this island nation unique in the world.

Today, New Zealand has a population of 4.4 million, of which about 69% are of European descent, 14.6% are indigenous Maori, 9.2% are Asian, and 6.9% are non-Māori Pacific islanders.

New Zealand has a long coastline and more than 15% of households own their own yacht. New Zealand people are known as the world's leading yacht designers, and they have always dominated the world's yachting, canoeing, windsurfing and rowing competitions.

Hiking, camping, fishing, bush adventures and beach walks are also popular outdoor activities. As early as 1953, Sir Edmund Hillary, arguably the most adventurous New Zealander, had conquered mount Everest, the world's highest mountain. After him, many more intrepid people fell in love with mountaineering.

It can be seen that it is unique environment that makes New Zealand people what they are now.

3. CHARACTERISTICS OF EXTREME SPORTS

3.1 The Fundamentality in extreme sports

3.1.1 Based on traditional sports

Since extreme sports appeared in the 20th century, it had got many people's love. Extreme sports are sports that attach more importance to high-tech and give full chance to the people who want to motivate their physical and mental potential. Although based on traditional sports, extreme sports have developed very rapidly. We can see that people in the experience of extreme sports can return to nature and environmental protection. They can chase the self-challenge of breaking through the limit. Therefore, extreme sports are also called future sports. Extreme sports based on traditional sports show its unique self-challenge, breathtaking, high-tech permeability and business operation. We expect extreme sports will bring people a deeper experience.

3.1.2 Innovative variety

Extreme sports are recreational sports in which human beings use modern high-tech to maximize their physical and mental potential and challenge themselves in the process of integration with nature. Over the years, extreme sports have created a rich variety of activities, including roller skating, BMX Freestyle, skiing, diving, parachuting

and JetLev-Flying. The environment covers land, sea and sky. We believe extreme sports will give people a new form of surprising experience in the future.

3.2 Dependence of extreme sports

When it comes to the dependence of extreme sports, some highlights need to be clarified. The first is the intrinsic dependence of extreme sports itself. The emergence and development of extreme sports are based on the traditional sports, and we cannot ignore the reference of the traditional sports to the new extreme sports. The second is the external dependence of extreme sports, due to the limit of the movement of the form, its existence largely dependent on the particularity of the external environment, such as steep cliffs, towering trees, etc. Another is the dependence of extreme sports for equipment, in order to get better experience, some relevant companies have created a series of ancillary equipment to complete the extreme sports. To a certain extent, it also reflects the external dependence of extreme sports.

3.3 Frangibility of future extreme sports development

We can't ignore the danger that extreme sports brought to us. That's why the ACC(Accident Compensation Commission)exist in New Zealand. This is a free social health insurance system provided by the government of New Zealand. ACC insurance is available to all residents and foreigners in New Zealand. Moreover, New Zealand residents who are injured abroad may also apply to ACC for compensation if it affects their future work or life. Therefore, New Zealand is more attractive than many other countries to the adventurous people.

4. THE STATUS OF EXTREME SPORTS IN NEW ZEALAND TOURISM

As we all know, some people call New Zealand "The extreme sports paradise". Thus, this country has a representative place in extreme sports. We need to know deeply about its tourism development situation.

4.1 The development of New Zealand extreme sports

To know more details about adventure tourism in New Zealand, we need to collect the information of New Zealand tourism history and analyze the future tourism development direction. Now, the relevant points are as follows.

4.1.1 The history of New Zealand extreme sports development

When we heard about extreme sports, some words came to our mind. For example, Bungee Jumping\Parachuting\Drifting\Zorbing...These all are extreme sports. A detailed analysis of each extreme sport will help us to understand the history of extreme sports.

4.1.1.1 Bungee Jumping

The bungee jumping sport has already became a key for New Zealand. In the1980s, AJ Hackett and Henry van Asch built the first commercial bungee jumping organization (KawarauBridgeBungy) in Queenstown, New Zealand. Then, this sport had created an exclusive new history\spread all over the world and given real happiness to the people who finding the thrill. Now, the highest bungee jumping is 134 meters which is very incredible. When people jumped out of the platform, they will feel the nature and get an unforgettable experience.

4.1.1.2 Parachute Jumping

The NZONE parachute jumping is the most famous organization in New Zealand. Tandem Skydiving in Queenstown since 1990, NZONE Skydive was NZ's first Tandem Skydive operation and is the only Tandem Skydive company to have won New Zealand's Supreme Tourism Award. You can choose three kind of parachute jumping from the standard. The first is 9000 feet height, the second is 12000 feet height and the last one is 15000 feet height. Skydive Wanaka is the only professional team that lead you experience the parachute jumping. When you jump out of the plane, you will take a view of whole south Alps and enjoy the Wanaka lake. Besides, Glenorchy and Taupo will give a cheaper parachute jumping experience than NZONE. Skydive Franz holds the highest parachute jumping project in New Zealand. You will fly in air about 75 seconds and see the jokul if you join the Franz parachute jumping.

4.1.1.3 Surfing

Compared with other extreme sports, Surfing will give a whole new world to you. Taranaki's semicircle coast is a great place to surf, that's because it brings in the tides at a 180-degree range and constant waves to Taranaki's beaches. Another amazing is Piha beach in the southwest Auckland. This is the best surfing beach in New Zealand. Every day, countless surfers gather here to challenge themselves.

4.1.1.4 Ziptrek Ecotours

Ziptrek Ecotours was founded by two lifelong friends and entrepreneurs, David Udow and Charles Steele, who came together with the goal of creating not only the first zipline tour in North America but also a tour that would provide you with the unique combination of true nature based learning and the rush of adrenaline felt while soaring over some truly spectacular vistas. It brought a new future for New Zealand adventure tourism. On Ziptrek tours you enjoy an unforgettable opportunity to explore, learn and delight in the thrill of an aerial adventure in natural environments that lend themselves perfectly to an enlightening ecological curriculum.

4.1.1.5 Iceberg Hiking

When we think about iceberg hiking sport, the most famous is Tasman Glacier Hiking. Tasman Glacier is located in Tasman Lake, Mount Cook national park, south island, New Zealand. The glacier which has a length about 27 kilometers is the longest glacier in New Zealand and it is one of the longest glaciers in the world. When you walk there, you will see gillies carved by glacier and meandering rivers. It will leave you a pure and irreplaceable memory in your life.

4.1.1.6 Swing

New Zealand has the biggest swing in the world which called 'Nevis Swing'. Compared with parachuting and bungee jumping, Nevis canyon swing brings a unique extreme sport experience for you in New Zealand. And there is nothing like swinging between canyons to free your mind and chase fun through extreme sport for body. Over the years, Nevis swing has been sought after by many extreme sports enthusiasts and won numerous praise. We believe that, Nevis swing will remain its unique in

New Zealand in the future.

4.1.2 The direction of New Zealand extreme sports future
For further development, we have to discuss the direction of extreme sport. With several decades, extreme sports have a very long history that can be traced back. However, the future development direction should be to combine the extreme sports with the youth education to deepen the research of it from the theoretical level. In addition, make full use of the natural space, and constantly expand the group of extreme sports participation, so that extreme sports can become a more popular form of sports. The development of low-risk extreme sports is also a direction of future development, because safety and security measures are extremely important in sports participation.

4.2 The effect of New Zealand extreme sports for other countries in the world

As a country where extreme sports are widely promoted, New Zealand can be called the country of extreme sports. Its outstanding experimental development of extreme sports has become an aspect imitated by many countries. New Zealand has provided some references to other countries in terms of tourism strategy formulation and industrial development.

5. EXTREME SPORTS PROBLEMS EXISTING IN NEW ZEALAND TOURISM

5.1 The risk of extreme sports

Every coin has two sides. It's the same with tourism development. Now, the author will give some opinions on the risk of extreme sports. On one hand, extreme sports have their own risks with the development of tourism. On the other hand, compared with professional group, the self-organized travel group has more possibility to have sudden danger. Thus, we should pay more attention to the research on the safety of extreme sports development and use knowledge to protect tourists who joined the adventure activity.

5.2 The destructiveness of extreme sports for environment
What we should learn clearly is the subjective activity of human being. Whether it's positive or not, We must make some effect to the surrounding environment when we participate in some activity. Therefore, the research on the destructiveness of extreme sports for environment is meaningful. There is no doubt that extreme sports can destruct the ecological environment through damaged grass or cliff. Many tourism resources are non-renewable. Thus, more specialist should attach importance to the rational use of natural tourism resources to keep ecological balance, and make scientific overall planning. We believe that the quality of tourism can be developed faster in the future.

5.3 The retardance of extreme sports development

The theory does not record the exact time of the birth of extreme sports, but it can be known that since the birth of extreme sports, it has been loved by the majority of people. People who have the attitude of not afraid of hardships and dangers are willing to try new things. Thus, extreme sports quickly became popular. As a world famous extreme sports place, New Zealand has more forms of sports. But at the same time, we have to admit that the development of extreme sports is sluggish, because of the environment

and other restrictions, it is difficult to develop new extreme sports, so people have been immersed in the existing activities. Hope this situation will be improved in the future.

6. SUGGESTIONS FOR FUTURE DEVELOPMENT IN NEW ZEALAND TOURISM

In view of the characteristics of extreme sports, tourism development and existing problems in

New Zealand, suggestions for future extreme sports development have been proposed as follows.

6.1 Strengthening the theoretical research of extreme sports development

More and more like extreme sports as time going by, but the corresponding theoretical research is little. We expect that sufficient theoretical knowledge can greatly deepen our understanding of extreme sports and partly protect our safety.

6.2 Completing relevant laws and regulations with extreme sports experience

In order to improve participant safety and protect environment. Local extreme sports organization should be proud to conform to the safety principals of tourism.

6.3 Cultivating a professional team

More people join in New Zealand extreme sports, Thus, local relevant company should pay attention to build professional team, provide sustainable jobs in the community and create its own renewable energy. On one hand, these teams will devote their power to insure the adventure tourism safety. On the other hand, they will promote the development of local tourism.

6.4 Emphasizing future market of adventure tourism

Extreme sports are soaring globally, with the industry's revenue reaching \$7.88 trillion in 2015, and the global adventure travel market is expected to grow another 46 percent between 2016 and 2020.

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Convergence, Differentiation and Innovation of National Physical Education Policies

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Abstract: The innovation of school physical education is not only an important choice to realize the development of the Chinese nation in the new era, but also the soul of the development and progress of Chinese sports. It is a key measure to improve the quality of the Chinese nation and cultivate thousands of young people, which can serve the people and social development of the motherland in the future. Therefore, it is urgent to realize the innovation of national physical education. This paper will take the national physical education policy as the starting point and the policy as the guiding basis of education work, analyze the convergence and differentiation of physical education policy, put forward the innovative ideas of physical education in the next stage, and enrich the theoretical connotation of physical education in China.

Key words: Physical education policy; Policy differentiation; Educational innovation

1. THE CONVERGENCE OF PHYSICAL EDUCATION POLICY

First, quality education should be oriented to all students. In recent years, China has made a lot of efforts to popularize the nine-year compulsory education, that is, to face the whole, to really guide every student of the right age to receive education. Second, the basic requirement of quality education is to promote the all-round development of students, and to promote the good development of all aspects of students' moral, intellectual, physical, aesthetic and labor. This is our long-standing education policy. Therefore, we should implement this policy in the process of implementing quality education and attach great importance to the all-round development of students. Third, the development of quality education is to fully cultivate students' innovative spirit and practical spirit. In the past for a long time, China's basic skills and basic knowledge level in the process of carrying out basic education is relatively high, which has been widely recognized in the world. However, there are still many deficiencies in the aspect of cultivating students' ability. In the field of education, we should attach great importance to this aspect in the process of carrying out education, so as to promote students' practical ability and the spirit of innovation has been further improved. Knowledge is important for the growth and development of students, but we should not let knowledge limit the development of students' thinking. Instead, we should take knowledge as the basis of people's understanding and transformation of the world, change the indoctrination style of education, integrate all kinds of knowledge into students' cognitive structure, and ensure that students can really learn and use it flexibly. Fourth, the development of

quality education is to fully guarantee the active, lively and vivid development of students. Innovation is what everyone wants to do, but how to realize the real innovation, we should really take the students' initiative as the basic premise, attach great importance to the students' initiative spirit, and carry forward the initiative spirit. This kind of teaching goal of respecting students' initiative spirit also needs teachers to apply heuristic teaching method in the teaching process to guide students to think and explore actively. Fifth, quality education focuses on the lifelong sustainable development of students. The purpose of quality education is not to teach. In the process of teaching, we should not only let students learn knowledge, but also guide students to learn knowledge, and give students the knowledge that opens the door. In such an era, our basic education should guarantee students' lifelong sustainable development ability [1-6].

2. DIFFERENTIATION OF PHYSICAL EDUCATION

First of all, limited by the understanding and prejudice of exam oriented education, many primary school education does not have the position of physical education. Due to the influence of exam oriented education, many primary school teachers and leaders put physical education in an indispensable position. For a long time, the standard to measure the quality of school running is put on the enrollment rate, and the weight and status of physical education become more and more important I'm embarrassed. Many school physical education classes are often occupied and excluded, so that the current primary school students spread the saying that "physical education teachers always ask for leave for the most things, physical education teachers are the weakest and always sick", and even some students who are excellent in learning and are expected to enter a good school relax their awareness of moral education and physical education. Secondly, due to the lack of attention of primary schools and students, many physical education teachers' attitude towards physical education has become very negative. In most cases, physical education is a mere formality, and the real classroom teaching is not fully implemented, let alone extracurricular physical education activities. Finally, in order to cope with the pressure of entering a higher school, many students even begin to give up physical exercise, which seriously deviates from the all-round development of students and violates the basic requirements of quality education.

3. INNOVATION OF PHYSICAL EDUCATION

3.1 Change ideas

At this stage, many primary and secondary school teachers in our country are still affected by the traditional concept. In the process of carrying out the actual teaching, they

excessively pursue the classroom structure. Students have a serious sense of burnout in the physical education classroom in the long run, and it is difficult to pay high enthusiasm in the process of carrying out the teaching. In most cases, physical education teachers in the process of teaching due to their own habits on the initiative of students have a serious constraint. For example, in the process of teaching, students are always organized to jog in four columns, followed by unarmed exercises, and often use unarmed exercises and exercise body muscles to end the teaching, and then leave time for students to carry out free activities. In this teaching mode, students' interest and enthusiasm in physical education classroom are seriously limited, and it is difficult to achieve the expected teaching quality. In the face of the continuous promotion of quality education, in the process of teaching, we should pay attention to the development of all aspects of students' quality, cultivate students' lifelong sports consciousness, guide students to develop the good habit of hands and brains, and ensure that students' physical quality is fully improved. In the process of teaching, teachers should actively change their own ideas, change teaching methods, adopt game teaching method, improve teaching quality, guide students to learn in a relaxed and pleasant atmosphere, and add game teaching method in boring learning, so that students will be more tolerant and easier to accept. In the process of teaching, teachers should boldly try to promote students' innovation ability and thinking ability. At the same time, teachers should also change their role, guide students' understanding and perception in the process of teaching, ensure that students can not only learn the corresponding technology, but also cultivate students' interest. In the process of physical activities, teachers can abandon the previous single gymnastics teaching, let students create their own warm-up activities, enrich students' learning forms, stimulate students' interest in learning. For each class, teachers should actively and fully prepare, organize various effective teaching links, design some effective learning situations, gradually guide students to dare to innovate, reflect teachers' leading role in the process of physical education, and cater to the development of quality education.

3.2 Establish a correct moral outlook

First of all, in the process of teaching, teachers should actively formulate some classroom rules to truly realize the daily education of the classroom. In the process of establishing classroom rules, it can ensure the gradual infiltration of moral education. A good classroom rules can guide students to develop a sense of positive compliance with the rules, and can fully protect students to form a disciplined, polite and positive moral character. In the process of restricting students' sports activities, teachers fully strengthen students' consciousness of standardization. The queuing training in primary school classroom can not only exercise students' physical quality, but also ensure that students' collective consciousness can

be fully improved, and guide students to form a good habit of observing discipline. Therefore, teachers should pay more attention to students' harmony and unity in the process of queuing training. Secondly, as an important measure to improve students' physical quality, physical education can fully guarantee students' physical quality to be fully exercised, and guide students to establish a healthy consciousness, so as to truly achieve the education goal of improving students' comprehensive quality. In the process of teaching, teachers should use various means to ensure that students' bad behavior can be effectively corrected, stimulate students' interest in sports learning, and help students' physical and mental development. Thirdly, in the process of physical education, teachers should enhance their sense of responsibility, ensure that the number of students' safety education is fully improved, and guide children to form a good sense of safety. Finally, teachers should focus on cultivating students' moral consciousness and improving their psychological quality. In the process of physical education, students usually need to overcome multiple difficulties in order to truly achieve the desired teaching objectives. For primary school students, their own sports behavior characteristics are very obvious. Teachers should carefully observe the students' behavior in the process of activities, appropriately adjust the students' psychology, guide students to overcome all kinds of difficulties and ensure their own sports level.

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Research on Cloud Computing Virtual Resource Scheduling Model

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Abstract: In order to make full use of the application advantages of cloud computing technology and realize the scientific management of cloud computing resource scheduling, this paper constructs a cloud computing virtual resource scheduling model, which constantly modifies, optimizes and improves the virtual resource scheduling management process according to the relationship between various entities. On this basis, the virtual resource scheduling model is optimized by simulation experiment the results show that the construction and application of virtual resource scheduling model can not only improve the load balance of virtual resources, but also promote the development of resource pool towards virtualization and flexibility.

Key words: Cloud computing; Virtual resources; Scheduling model

1. INTRODUCTION

In recent years, with the continuous development and popularization of cloud computing technology, massive information data aggregation phenomenon has appeared in China, which requires technical personnel to give full play to and make use of virtual management technology to continuously improve the utilization rate of cloud computing information data. In the traditional virtual resource scheduling mode, technicians need to allocate the virtual resources to the designated users by using virtual machine and dynamic and automatic way according to the user's needs. However, this model has some disadvantages. Once the allocation and scheduling model is too simple, it will directly affect the efficiency and effect of cloud computing virtual resource scheduling [1-5]. Therefore, it is particularly important to strengthen the construction of cloud computing virtual resource scheduling model.

2. CLOUD COMPUTING VIRTUAL RESOURCE POOL

Cloud computing is an information infrastructure commonly used in the Internet. In the specific application, technicians need to transfer the virtual resources to the cloud virtual machine in the way of abstract processing according to the parallel relationship between the computer cluster and the computing mode, so as to form the virtual resource pool of cloud computing. The cloud computing virtual resource pool model is shown in Figure 1. It can be seen from the figure that the resource pool is mainly composed of the following three parts: edge part, connection service and singing. The emergence and application of virtual resource pool lay a solid foundation for better building cloud computing virtual resource scheduling model and improving the efficiency and effect of virtual resource scheduling. In addition, due to the

uncertainty of the boundary definition of the virtual resource pool, in the specific application of the resource pool, we can make resource scaling changes according to the actual needs, so as to improve the practicability of the virtual resource pool. In addition, cloud computing virtual resource pool, as a common mode of resource virtualization, can timely analyze and deal with all the details of the physical resource layer, which provides a strong guarantee for the normal, stable and reliable use of the upper management middleware.

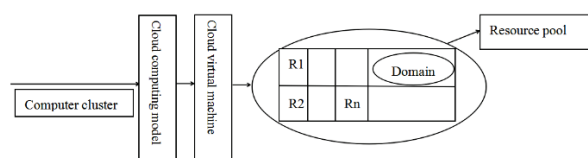


Figure 1 Cloud computing virtual resource pool model

3. CLOUD COMPUTING VIRTUAL RESOURCE SCHEDULING MODEL

3.1 Cloud computing virtual resource entity relationship

In order to better understand and grasp the entity relationship between cloud computing virtual resource entities [1], technicians should divide virtual resources into the following components according to the aggregation of data center, namely virtual server, scheduling domain, application service, cloud data center, etc. The relationship between virtual resources in cloud computing data center is shown in Figure 2. As can be seen from the figure, the cloud computing physical server is mainly composed of memory, network, CPU and other parts. In the specific application, virtual server can reasonably allocate user service requests to the specified server. Once the user visits the specified server and fails to work normally, the intelligent cluster system will transfer the user's service requests directly to the normal server by means of automatic transfer.

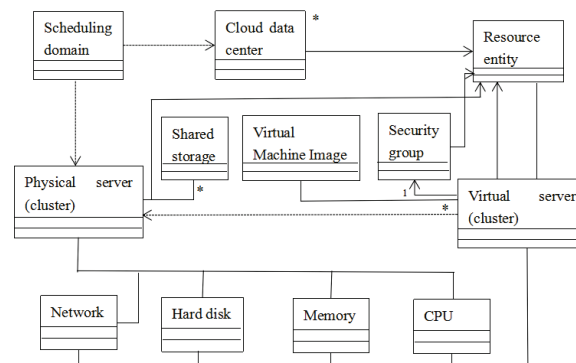


Figure 2 Relationship between virtual resources in cloud

computing data center

3.2 Cloud computing virtual resource scheduling management process

This module is composed of user management node module and cloud computing node management module. In the process of virtual resource scheduling, users need to submit related tasks to the virtual resource management center. The virtual resource management center judges the types and attributes of these tasks[2]. Then, according to the final judgment results, scientific task feature scheduling algorithm is selected to process them. On this basis, the final processed task information is transmitted and sent To the designated task management center, at this time, the task management center will submit the user tasks to the corresponding computing node, and the computing node will process these user tasks, and the final processing results will be timely and effectively fed back to the corresponding task management center [3]. Then, the task management center will return the final calculation results to the user.

3.3 Cloud computing task scheduling algorithm

As an important technology of cloud computing, virtual resource pool can efficiently schedule cloud computing virtual resources. Cloud computing data center can be divided into several scheduling domains. Each scheduling domain contains multiple physical machines, and each physical machine contains a large number of CPUs[4]. In order to make full use of the application advantages of virtual resource pool and ensure the reliability of cloud computing virtual resource scheduling model, technicians should pay attention to the design and implementation of cloud computing task scheduling algorithm. In this process, first of all, according to the internal load attributes of the physical server, the internal load of the server should be dynamically changed. When each physical server completes the corresponding load processing within the specified time, the physical server can run normally, stably, reliably and safely. Secondly, according to the internal CPU utilization of the physical server, the average load in the scheduling domain should be accurately calculated, and the final calculation results should be fed back to the designated physical server [5]. Finally, on the basis of the set alarm threshold, the running state of the physical server is judged. If the physical server has abnormal running problems, it is necessary to comprehensively and accurately analyze the attributes of memory, network and CPU, and find out the minimum variance value of the three load values.

4. EXPERIMENTAL RESULTS AND ANALYSIS

In order to better verify the effectiveness of cloud computing virtual resource scheduling model, we design cloud computing virtual resource pool model in different number of tasks, the load balance value changes. In this process, first of all, technicians should use the virtual resource scheduling algorithm to scientifically control the processing time of related tasks. It is found that when the number of tasks executed is the same, the execution time of user tasks is the shortest, and the fluctuation of

execution time is the smallest. Therefore, user task processing has a certain time controllability. The experimental results show that the cloud computing virtual resource scheduling model constructed in this paper can fundamentally solve the problem of cloud computing virtual resource load, ensure that the computing nodes can continuously improve the load balance of cloud computing virtual resources on the premise of high quality and high standard processing of related tasks, and play an important role in further improving the user experience.

5. CONCLUSION

To sum up, in order to improve the construction effect of cloud computing virtual resource scheduling model, technical personnel should design and implement the virtual resource scheduling algorithm in strict accordance with the cloud computing virtual resource scheduling process on the basis of comprehensively considering the relationship between cloud computing entities. At the same time, combined with the overall load of the virtual resource pool, through the use of artificial intelligence technology, we can make further progress Improve the load balance of cloud computing server step by step, so as to ensure the reliability of cloud computing virtual resource scheduling model construction, and bring good service experience for users.

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Research on Optimizing the E-Commerce Supply Chain System of Agricultural Products in Small and Medium Sized Enterprises

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Abstract: With the society stepping into the Internet era, the development of e-commerce has reached a heyday. At present, China's e-commerce of agricultural products has developed rapidly, and has become another hot e-commerce following 3C electronics and clothing. E-commerce has improved the market competitiveness of agricultural products, broken the limitations of traditional agricultural products sales, and the supply chain system is the core of agricultural e-commerce. Standardized e-commerce supply chain system of agricultural products is the foundation of e-commerce development of agricultural products. The e-commerce supply chain of agricultural products begins with the supply of agricultural products and ends with the consumption table. The e-commerce platform of agricultural products is the main body in the construction of the supply chain. This paper aims to analyze the current small and medium-sized enterprise e-commerce supply chain system of agricultural products, aiming at the problems existing in the supply chain system, and then puts forward countermeasures and suggestions to optimize the e-commerce supply chain of agricultural products.

Key words: SMEs; E-commerce; Supply chain; Logistics

1. INTRODUCTION

China is a big country of agricultural products. Agricultural products economy plays a mainstay role in the development of national economy. The circulation of agricultural products in the market is related to the development of agricultural industrialization and the increase of farmers' income. The country has been committed to solving the "three rural" problems. The emergence of e-commerce has greatly improved the circulation of agricultural products. With the e-commerce of agricultural products entering a new stage of development, agriculture is also facing new opportunities and challenges; How to efficiently organize the logistics of agricultural products, promote the integrated operation of each node enterprise, and realize the value-added of product circulation; how to dredge the convenient downstream retail channels, realize the docking of production and circulation, and improve the circulation speed to realize the value of products, has become a problem worthy of attention and research, so the optimization of agricultural product supply chain is particularly important[1-4].

2. PROBLEMS IN E-COMMERCE SUPPLY CHAIN OF AGRICULTURAL PRODUCTS

2.1 The purchasing chain is bloated and the product

positioning is not accurate

Purchasing link is the basis of the supply chain of agricultural products. In order to better meet the needs of consumers, the purchasing link of e-commerce enterprises should follow the principle of customer-oriented. Only in this way can agricultural products be promoted, and it is consistent with the service value of e-commerce. However, in the actual e-commerce supply chain of agricultural products, we can not understand the needs of consumers. The importance of e-commerce of agricultural products, in the procurement process, still depends on the company's e-commerce experience in other industries, source of goods, inventory to determine the direction of procurement, want to use the market to guide consumers, ignoring the particularity of agricultural products, especially for fresh agricultural products, short timeliness, high storage cost, if can not be sold in a short time, it will greatly increase the enterprise's fundamental competitiveness and products Loss, e-commerce enterprises can no longer accurately analyze the consumer demand and purchasing power for agricultural products, which will lead to oversupply or oversupply in e-commerce. The former will lead to agricultural products squeezing inventory, decay and loss, while the latter can not bring greater profits to e-commerce enterprises. Updating the product procurement chain and accurately positioning the procurement direction are the prerequisite problems to optimize the e-commerce supply chain of agricultural products.

2.2 The e-commerce logistics system of agricultural products needs to be improved

Logistics technology is backward in the transportation of agricultural products. In view of the particularity of some agricultural products, we need to carry out packaging, refrigeration and other treatment. The cold chain logistics transportation of agricultural products can avoid the decay and damage of agricultural products in the transportation process, and pollute other products. The freshness of agricultural products can be preserved to the greatest extent, and the quality of agricultural products can be improved. In the flow chain, the cold chain logistics technology is backward, the e-commerce enterprises do not pay enough attention to it, and the poor cold chain transportation environment directly leads to the high cost of cold chain logistics. In order to reduce the transportation cost, the e-commerce enterprises choose normal temperature transportation instead of building a complete logistics supply chain, which greatly leads to the loss of agricultural products in the transportation process,

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affects the quality of agricultural products, and reduces the consumption of consumers. According to incomplete statistics, the cost of cold chain logistics is 40% to 60% higher than that of ordinary logistics, and the utilization rate of cold chain logistics is low, resulting in the circulation loss rate of agricultural products as high as 25% to 30%. In terms of quality, in addition to the pollution-free and green food recognized by the state, there is no standard for other agricultural products, and the purchase of agricultural products has always been in a weak state in terms of acceptance standards. In the environment of large-scale operation, relying on manual detection means that a large number of agricultural products will flow to the market without effective inspection, which results in the quality of agricultural products in a relatively out of control state in the follow-up link of terminal sales. Although the source can be found through the traceability mechanism, it has caused huge social waste and affected consumption. The confidence of farmers in agricultural products.

3. OPTIMIZE THE E-COMMERCE SUPPLY CHAIN SYSTEM OF AGRICULTURAL PRODUCTS

3.1 Optimize purchasing channels and enhance product competitiveness

In order to improve the efficiency of direct procurement and transportation of agricultural products, we should set up effective procurement standards for suppliers. This can reduce costs at the purchasing end, ensure timeliness at the transportation end, and strictly control the quality of agricultural products to ensure food safety. In order to improve the economic profit of e-commerce enterprises, and control the direct suppliers, we can adjust and deploy the products in a more timely manner according to the market situation, and constantly adjust the agricultural products according to the changes of consumers and seasons. We can take a variety of forms in the construction of direct suppliers. For agricultural products with high added value, we can adopt the contracting mode between e-commerce enterprises and farmers. For agricultural products with low added value, the cooperation mode between e-commerce enterprises and production organizations can be adopted; for agricultural products that need to be processed, the cooperation mode between e-commerce enterprises and processing enterprises can be adopted. E-commerce enterprises choose the purchasing channels according to their own enterprise positioning.

3.2 Building big data information management system

In the supply chain of agricultural products, it is very important to build a big data information system. Through the database and information management system, the information of enterprises in the supply chain of agricultural products is analyzed and sorted out. Through the big data information management system, e-commerce enterprises can query the product information at any time, and at the same time, they can analyze and compare the product data information at any time, which can effectively judge Break out their own enterprises in

the agricultural supply chain problems, so as to timely and accurately grasp the market information, reasonable production plan.

3.3 Integration of agricultural products supply chain enterprises

Supply chain enterprises enter a certain area in the form of cluster alliance, which not only expands the scale of agricultural products supply chain cluster, but also improves the competitiveness of e-commerce enterprises. Supply chain integration enables members to cooperate effectively in resources and information, which is conducive to complementary advantages, reducing market risk and improving the efficiency of production and logistics. Moreover, the integration of agricultural products supply chain is helpful for the timely transmission of information among the members of each supply chain, ensuring the timely update of market demand information, so as to plan the strategic sales mode and allocate resources reasonably. For enterprises, the integrated supply chain of agricultural products is conducive to play its own core strength, while converging with the core advantages of other enterprises, making the whole supply chain play a huge advantage. Moreover, the integrated supply chain of agricultural products greatly promotes the process of large-scale customization of agricultural products, which is conducive to the transformation and upgrading of agricultural industry.

4. CONCLUSION

5. With the core e-commerce enterprises constantly entering the agricultural product market, the small and medium-sized enterprises in the agricultural product supply chain can effectively control the cost, create profits, increase the competitiveness of enterprises and effectively resist the core e-commerce enterprises only by continuously optimizing the supply chain system, grasping the market consumption demand of agricultural products, reasonable production, efficient construction of the third party logistics supply chain and forming integrated operation. The impact of the industry.

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Research on the Evaluation Strategy of the construction of college Physical Education Gold Course

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Abstract: With the development of information and communication technology, network technology and mobile terminals are widely used in higher education, and the trend of globalization and sharing of higher education is increasingly obvious. Since 2012, information technology has been deeply integrated with education and teaching, online open courses based on gold courses have been greatly developed, and digital education resources have been constantly enriched. So far, more than 12, 500 gold courses have been launched in China, and more than 200 million people have punched cards for online learning, ranking first in terms of number and scale of application in the world. Against this background, the development of Gold courses in Chinese universities has been constantly improved, which has promoted significant changes in the mode of teaching and learning. In October 2019, the Ministry of Education issued the construction of first-class undergraduate course of the implementation of the Ministry of Education, planning to use three years' time, public sports course in colleges and universities should grasp the development opportunity, actively promote the information technology and the integration of physical education teaching of the curriculum reform, to explore the feasible path gold class construction, promote the education quality improvement.

Keywords: College Sports; Mixed Teaching; Gold Class; Evaluation Strategy

1. INTRODUCTION

Blended teaching integrates the advantages of traditional classroom teaching and online course teaching, and is a teaching model in line with the characteristics of The Times. How to carry out blended teaching based on online open course in college SPORTS has gradually attracted the attention of experts and scholars. After studying the necessity of applying mixed teaching in university physical education, Zhang Min et al. think that applying mixed teaching mode in university physical education is also an imperative reform. Blending Learning is a kind of online + offline teaching mode combining the advantages of online course teaching and traditional classroom teaching. Hybrid teaching is not a discard of traditional teaching, nor is it a new teaching mode under the information age, but draws on the advantages of traditional teaching and new era teaching, and takes the advantages of traditional classroom teaching and modern network teaching, so it is in line with the characteristics of the development of The Times and the characteristics of

education. Blended teaching makes students' dream of full time and space learning possible, realizes that students can apply the corresponding learning technology at different times to achieve the best learning effect, and meets the personalized teaching needs of public physical education courses in colleges and universities [1-11].

2. OPEN ONLINE COURSES

Open online courses are the foundation of hybrid teaching. After several years of explosive development, open online courses have not only increased in number, but also developed into a variety of forms, including early open video courses and resource-sharing courses, as well as new forms such as Gold courses and SPOC. At present, in the mixed teaching of physical education in colleges and universities, online courses are mainly in the form of gold course and SPOC. Golden Course is a transliteration of MOOC, which is also called Massive Open Online Courses. It is an Open teaching mode born with the development of Internet technology and popularization of mobile terminals. The golden course relies on Internet technology to open and share curriculum education resources to all members of society, so that high-quality educational resources can be used by more people, enrich educational means, and promote educational fairness to a certain extent. With the widespread promotion of gold courses, researchers have found that gold courses have the advantages of repeatable viewing, learning anytime and anywhere, and meeting personalized learning needs, etc. Meanwhile, there are also defects such as high dropout rate and low completion rate.

3. COMPOSITION OF PUBLIC PE COURSES IN COLLEGES AND UNIVERSITIES

The teaching objectives of public physical education courses in colleges and universities determine the teaching content of public physical education courses in colleges and universities. For example, if students want to achieve the goal of sports participation with certain sports culture appreciation ability, content related to sports competition rules should be arranged in college physical education courses so that students can understand the games. Without this part, students will not know what is offside in football game, what is offensive foul in basketball game, what is invalid start in rock climbing game and so on, and will not be able to enjoy the beauty of sports competition normally. According to the outline, through literature materials, expert interviews and other studies, it is found that the public physical education curriculum in colleges and universities not only contains the necessary physical

exercises and physical skills learning, but also includes various theoretical contents such as sports culture, competition rules, sports etiquette, sports protection, sports news, fitness methods and so on. There is no doubt that theoretical knowledge of physical education, such as sports culture, competition rules, sports etiquette, etc. can be completed through online teaching, just like other subjects. Practical content.

4. THE DEVELOPMENT PATH OF MIXED TEACHING OF COLLEGE PE COURSES

As for the construction of national golden course, Wu Yan, director of the Higher Education Department of the Ministry of Education, put forward the official gender standard of advanced, innovative and challenging degree. The construction of mixed golden course of physical education in colleges and universities should also be carried out around this standard to improve the degree of challenge of the course, expand the depth and breadth of knowledge and increase the content of the course. Through mixed teaching, we can stimulate students' interest and potential in learning, increase students' burden of science, increase their input in learning, realize the learning challenge that can only be met by course jumping, and improve the quality of education and teaching. Through the research, the construction of mixed gold course of college physical education can refer to the following path.

4. 1 Scientific classification of content is the premise of mixed teaching of college sports

The physical education discipline emphasizes the characteristics of practice and personal experience, which determines that not all contents of public physical education courses in colleges and universities can be taught online. Therefore, to carry out mixed teaching, the problem of which contents can be mixed with gold courses and which must be taught in class should be solved first. Through expert interviews and other research, get way from students knowledge and skills is a teacher to teach or students themselves practice Angle, has carried on the induction, the college public physical education teaching contents is divided into practical content (mainly students own practice), theoretical content (teacher taught primarily) and comprehensive content three categories. The practical content mainly includes special skill learning and physical fitness training, which is mainly obtained by students' repeated practice with the help of teachers. The theoretical content mainly includes sports culture, theories of sports events (such as the birth, development and evolution of sports events, competition forms, etc.), sports etiquette, competition rules, etc., which are mainly obtained through teachers' teaching. The comprehensive content is the practice and operation skills with low difficulty that can be mastered without too much assistance from teachers, including scientific fitness methods, exercise protection, exercise prescription, exercise recovery and so on. As in other subjects, there is no doubt that blended teaching can be achieved only by teachers teaching students the knowledge and skills they can acquire. Through the research, the practical content that can be mastered by students only by their own

practice can also be strengthened by the blended teaching. For example, Zou Ting believes that the learning of sports technical movements and basic theoretical knowledge of sports can be enhanced through online learning before class, so as to improve teaching efficiency and develop and cultivate students' comprehensive quality.

4. 2 Online resources are the foundation of mixed teaching of college sports

According to the survey, most of the current college students are the post-00s who grew up in the information age and have been used to the huge, convenient and diverse network space. They have a clear idea of what they want and it is very difficult to attract them to keep learning interest. Therefore, the content production of online courses should first consider how to stimulate students' interest in learning, pay attention to improve the attractiveness of course design, and design a good interactive link centering on students. For example, the traditional way of teachers' explanation plus PPT presentation is to teach theoretical content such as the origin, development and classification of sports items, which is difficult to attract students' interest and leave them a deep impression. They can also introduce their favorite stars, current events and hot spots related to the teaching content, and adopt more vivid styles and cheerful background music, so as to make the picture effect as beautiful as possible. As in the origin and development of rock climbing, rock climbing online programs chapter introduce the development history of rock climbing, through the design of micro movie mountain legend rose by storytelling introduces the rise of European alpine climbing, then gradually reveal because of the needs of the war in the Caucasus mountains and promote the development of rock climbing; In the introduction of the value of rock climbing, the film negotiators' movie stars Yang Mi and Huang Zitao were selected to do rock climbing fitness, so as to increase the students' sense of identity to rock climbing. When teaching the common wrong operation of rock-climbing protection technology with micro-video, the image of the worst conservator was created by using exaggeration which originated from reality but was higher than reality, so as to strengthen the students' cognition and mastery of the correct technical movements.

4. 3 Curriculum design is the core of mixed teaching of college physical education

The core of making the mixed gold course is to design the mixed course well. In the process of implementing mixed teaching activities, the three teaching stages of physical education courses in colleges and universities have different teaching emphases before, during and after class. At the same time, they are integrated, interrelated and interdependent, so teachers should make reasonable overall arrangements. Pre-class learning activities should be student-centered, and teachers should guide students to construct knowledge by purposefully arranging learning tasks. On the teaching plans, give students plenty of time to autonomous learning, use of mobile phones, computers and other mobile terminal learning teacher specified network curriculum resources and other information,

encourages students to learn and to participate in online social group interaction across class discussion, etc. , the main task is to complete the theoretical content of the study and practice content preview. Tutorial, according to the teacher, the students' teaching principle, speaker teachers organize and guide the students in the class, on the basis of self-learning and speak to take raw organic raw assessment, to practice generation, practice, talking and doing while rating, parallel interaction, gave birth to ask answer, directing students sideshow wait for a variety of methods to carry out the gold class depth integration of classroom teaching activities, to achieve accurate, personalized teaching, improve the efficiency of the use of class time, main task is through the teachers' practice of assistants practice content and comprehensive content of study. After-school teacher team still need to use mobile terminals and network teaching platform, through the assigned students training task after class, learning content and so on to keep track of evaluation of classroom teaching content to master degree and strengthen the motor skill learning, continue to encourage students in WeChat group, teaching platform for discussion online group theory knowledge, such as motor skills such as interaction, to create a good online learning for students. The main goal is to enhance physical fitness and enhance the learning effect of sports knowledge and skills.

4.4 Multi-means joint promotion is a strategy for improving teaching quality and gilding the curriculum

Hybrid teaching PE class in universities is a complex process that requires teachers use a variety of means for students to build a harmonious ecological of teaching, and in the process of teaching continuously exert positive influence on ecological parts of teaching, in order to maintain the healthy development of ecological teaching, arouse students enthusiasm for continuous learning physical education curriculum, improve the level of skills to master and physical quality, gold-plated for course. For example, blended teaching changes the time and space of the course into omni-directional and all-weather. Students may find and produce problems in the learning process at any time and any place, with different problems. Teachers and teaching assistants should timely deal with various questions and avoid hasty and amateur answers, which will directly affect the interactive effect of the course. It is difficult to undertake this task only by relying on the individual strength of teachers. It is necessary for teachers to set up a team of course teachers for the purpose of mobilizing the strength of teachers within the department to serve students' after-school exercise. In addition, it is also a good way to select the backbone members of the school sports team who are the same as the course sports project to form a teaching assistant team for assistance. On the one hand, increased the teaching management, service staff; On the other hand, sports team members have strong professional skills, which can guarantee their professionalism in interactive communication. For another example, PE teachers with multiple teaching classes can create conditions for students to communicate after class by organizing inter-class course teaching leagues, so as to build a prosperous teaching ecology and

improve students' interest in classroom learning and the effect of after-class practice.

4.5 Teachers and students learn from each other, and common improvement is the source of healthy and sustainable development of curriculum

For most physical education teachers in colleges and universities, mixed teaching is a new educational concept and form. The special attribute of physical education needs physical movement, which makes PE teachers in colleges and universities form the deep-rooted idea that classroom teaching is the only form of PE curriculum in colleges and universities. Most PE teachers in colleges and universities have never come into contact with and understand the mixed teaching mode. Mixed teaching enables physical education teachers to transform from traditional sports skill imparting to online physical education course resource builder, and from offline group exercise activity organizer to online learning and communication activities guide. For PE teachers in colleges and universities who are accustomed to the traditional teaching mode, mixed teaching is a new challenge, which requires them to attend more technical training and scientific research reports related to mixed teaching, timely grasp the latest theories, and improve the ability of mixed teaching.

5. CONCLUSION

Physical education teachers in colleges and universities should actively reflect on teaching, constantly find out the problems in the teaching process and correct them, so as to make the combination of online teaching and offline teaching more scientific and reasonable. In hybrid teaching process, students often found in the study and put forward many creative questions and Suggestions, teachers need to listen to their peers and students Suggestions for hybrid sports class, especially the classroom flip means, content of online teaching content rendering effects, to raise their teaching ability, to achieve the real teaching is learning. It is an inevitable trend of The Times that the public physical education courses in colleges and universities adopt information-based means to conduct mixed teaching of gold courses, which is also an important way to meet students' personalized learning needs and improve the teaching quality of courses. Due to the special subject nature of physical education, not all the teaching contents are suitable for online teaching. Therefore, to create the mixed gold course of physical education in colleges and universities, the teaching contents should be scientifically divided, scientifically planned and reasonably mixed teaching of gold course. In the construction process of mixed gold course in college sports, attention should be paid to the production quality of online resources such as teaching videos and teaching methods close to students should be adopted. Focus on the overall design of the course and arrange different points before, during and after class. At the same time, teachers need to design courses more attentively than traditional classroom teaching, make more work preparation before and after class, keep learning, actively listen to suggestions and feedback from peers and students, and improve their own blended teaching level.

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Research on the Application Value of Outreach Training Programs in Public Physical Education Courses in Vocational Colleges -- A Case Study of Power Grid Projects

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Abstract: Implementation scheme on the reform of the national vocational education important files as a guide, using the method of documentary, expert interview and logical analysis, comparative research and inductive deductive research method, to expand the training grid projects in public physical education curriculum in carries on the summary analysis, and the effective power grid development training project can reflect the students' physical quality, psychological quality and social adaptation of the difference of several aspects through scientific and effective physical training, psychological counseling, and project features infected students make the students' physical quality, and fully improve the psychological quality and social adaptation ability, promotes the development of students' physical health, It has achieved the goal and task of public physical education curriculum. Therefore, we should view the effective implementation of outward-bound training programs in physical education courses from different perspectives, integrate outward bound training programs into physical education classes effectively, and find that the advantages of outward-bound training programs can enrich the content system of physical education courses.

Keywords: Outward Bound Training; Power Grid Projects; Physical Fitness; Psychological Quality; Social Adaptation

1. THE PURPOSE AND SIGNIFICANCE OF THE STUDY

In January 2019, the State Council issued the national vocational education reform implementation plan ", file puts forward comprehensive reform idea on vocational education, professional education in colleges and universities put forward the comprehensive reform, to carry out the professional education in colleges and universities provide a lot of guidance, encourage universities cultivate applied skills talents with "spirit", put forward to carry out the pilot national vocational education undergraduate level 15 vocational colleges upgraded to pilot professional undergraduate course colleges and universities. Therefore, vocational colleges have put forward quite high standard requirements for public physical education. For students of vocational colleges, multi-dimensional physical education courses should be carried out instead of single, traditional and old-fashioned physical education courses.

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University, as one of the first batch of vocational undergraduate universities, introduced the outward growth training program in 2014, and began to integrate the outward growth training program into the classroom from 2019. Considering the characteristics of the outward growth training program (mainly safety risks), it mainly carried out field projects into the classroom. Although there are many national vocational and technical college sports public courses have courses in training programs, but in the process of practice is just a single expand training programs and practice rules, without too much in-depth study, and most of the students in the field to expand the practice training project are following I think is boring, is not the desired effect, power grid as a training site has been one of class projects into public sports class, from the perspective of practice effect evaluation analysis, would help the students from the aspects of physical, psychological, social adaptation was developed in an all-round way. The power grid expansion training program has a very practical value for the establishment of public physical education courses in vocational undergraduate universities, which can effectively avoid the development of curriculum singleness, enrich the curriculum content system, stimulate students' subjective initiative and improve their PE learning level in the process of practice. The successful establishment of power grid outward bound training program has certain application value and significance, we need to summarize the successful experience and set up more outward-bound training programs in line with students' reality.

2. THE RESEARCH OBJECT

This paper takes the application value of the development of the extended training power grid project in the public physical education course of vocational college as the object of study, finds out the advantages of the project and summarizes the successful experience of the project to obtain the due application value system.

3. THE RESEARCH METHODS

3.1 Literature method

Through cnKI, 174 relevant literatures were searched with "extension training" as the keyword, and 6 literatures were cited. Besides, relevant literatures were consulted in the library of Shandong Foreign Studies Vocational and Technical University and Rizhao Library, and relevant theoretical basis was obtained to provide reference information for this study.

3.2 Expert interview

Based on the main problems studied in this paper, I combined and summarized my own experience in the implementation of courses in the course of daily expansion training, and interviewed relevant experts and coaches in the development training, referring to their points of view, in-depth teaching analysis, and improving the objectivity and pertinence of the research.

3.3 Logical analysis

Logical analysis method is used to sort out the collected data, analyze and synthesize them, and make logical analysis on relevant theories.

3.4 Comparative study method

The problems related to the integration of the power grid project into the classroom are classified and sorted out in detail, and the relevant problems are analyzed quantitatively to obtain the corresponding theoretical basis. Comprehensively analyze the problems in the implementation stage of the course, and compare the actual training effect of students before and after, and get effective teaching methods.

3.5 Inductive deduction

Through relevant data query and fact demonstration, this paper deduces and summarizes the problems in the class of power grid development training program, extracts the inspiration for the integration of the development training program into the classroom, and puts forward relevant suggestions to provide reference for vocational colleges to successfully integrate the development of the development training program into the classroom.

4. RESULTS AND ANALYSIS

4.1 Application value of extension training programs in public physical education courses of vocational colleges

The power grid expansion training project is a comprehensive expansion training project integrating physical strength, intelligence and psychology. Students can get physical strength training through this project, and the level of physical strength can reflect the differences of individual physical strength of students from the side [1]. In the process of project implementation, the deficiencies and defects of individual physical qualities of students can be tested, and corresponding physical training methods and means can be formulated by finding out the deficiencies in physical qualities of students. Students will benefit greatly from integrating outreach programs with physical training. Through actual arguments in the process of power grid project implementation and effective body functional screening test, found that 40% of the student to utilize the climbing action by power grid show the upper limb lack of support and not through the grid, there are 30% of the students in the upper crouched lower limbs half squat through the grid to show the student's overall coordination and lower limb lack of support strength and not through the grid, there are 30% of the students to use the body into a flat position was carried through the grid shows the students lack core strength will not be able to move the body straight through the grid. This paper summarizes the deficiency of students in physical quality through practical research, and formulates relevant physical training means for the deficiency of students in physical quality on the

basis of existing conditions, so as to benefit students in many aspects and improve their physical quality level. In class, corresponding physical training plans are made for upper limbs, lower limbs and core areas. Students with insufficient upper limbs strength will be trained by means of straight arm support and push-ups step by step. The training cycle of straight arm support is two weeks, three groups are carried out in class every week, each group lasts for 1 minute, and the combination of class and after class exercises at least four times a week. This can effectively improve students' upper body strength and avoid the situation that students with very weak upper body strength cannot withstand the later high intensity training. After two weeks of straight arm support training, students will do push-ups after their upper body strength is improved. They will do three sets of 20 times per week for 5 weeks.

Core area strength training mainly uses 3 groups of plank support, each group 20 seconds interval 30 seconds; Side bridge training 3 sets of 20 seconds each with an interval of 30 seconds. Hip bridge 3 sets, each set 20 intermediate intervals of 30 seconds. The total training period is 8 weeks with no less than 3 times per week. The lower extremity strength training mainly consists of lunge squatting left and right legs 20 times each, 3 groups in total; Three training cycles of 8 weeks were performed in situ lunges and 20 times of left and right legs.

After 8 weeks of scientific and effective physical fitness training, it was found that the students could well support the ground when they passed through the power grid again, and the number of students who could effectively pass through the power grid with enhanced overall flexibility and lower limb squatting strength increased significantly [2]. At present, only 10% of students cannot pass through the power grid due to the lack of upper limb strength by 30% compared to the same period last year; 8% of students cannot pass through the power grid due to the lack of overall coordination and lower limb support strength by 22% compared to the same period last year; 4% of students cannot stretch their bodies through the power grid due to the lack of core strength by 26% compared to the same period last year. By the above data before and after the comparative analysis, through scientific and effective training methods, reasonable intermittent time dispatching, the reasonable arrangement of training cycle are able to improve students' physical quality, physical quality training and training after combining grid project can greatly improve students through the efficient grid, enriching the content of public sports classes.

4.2 Application value of outreach training programs in the public physical education courses of vocational colleges

Mental health development is an important content to follow the principle of all-round development of students. Contemporary college students need to improve their psychological quality to different degrees [3]. During the course of the power grid expansion training program, the students all had psychological problems such as fear, in confidence and timidity when they passed the power grid. Through the development of the expansion training program, we can find out the students' psychological deficiencies. We will make corresponding psychological

knowledge guidance strategies in view of the psychological deficiencies, and further improve the students' psychological quality.

Spiritual communication is to establish good relationship between teachers and students exchange, the basis of class, the teacher should communicate with students with amiable, comforting and encouraging words to encourage students, students will be on the psychological comfort, it can improve the students' psychological quality to avoid the students on the psychological fear [4].

Class can produce psychological fear, not self-confidence of students in psychological counseling, some psychological tests, for example, through analyzing the test results and the results of analysis to study effectively, making specific plan implementation of the student, can effective methods, such as by applying the method of conversation, undertake to the student counseling, make up for the lack of students' psychological aspects.

4.3 The application value of extension training programs in social adaptation in public physical education courses of vocational colleges

Social adaptation refers to social ability, the ability of an individual to establish an adaptive relationship with his family, school, community, etc., and the ability to distinguish between appropriate and inappropriate behaviors in a particular social environment [5]. Students in daily physical education are often reluctant to cooperate with each other, communication ways often appear obstacles. Lack of social skills, interpersonal skills and interpersonal communication skills, students and students lack of unity and cooperation spirit. The development of power grid project plays a great role in the behavior activities of students, which can directly make students happy, reduce their tension and anxiety, and thus regulate their mood and improve their mental health. The expansion training power grid project teaches in a specific site. The change of teaching environment and teaching method is always different from the previous PHYSICAL education class to find the fun of the project, so that students can forget their troubles, communicate smoothly with each other, and laugh and laugh. Improve the students' interpersonal skills. The application of the extended training power grid project can directly improve the social adaptability of modern college students and the

comprehensive quality of students can be improved comprehensively [6].

5. SUMMARY

Grid development training project can reflect the students' physical quality, psychological quality and social adaptation of the difference of several aspects through scientific and effective physical training, psychological counseling, and project features infected students make the students' physical quality, psychological quality and social adaptation ability improve, promote the development of students' physical health and achieving the target of public physical education curriculum. Therefore, we should view the effective implementation of outward bound training programs in physical education courses from different perspectives, integrate outward bound training programs into physical education classes effectively, discover the advantages of outward bound training programs, and enrich the content of physical education courses.

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