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On the Application of Grinding Technology for High-Speed Railway Rails

Lei Yu*

Xi'an Bureau Group Co., Ltd. of China Railway, Engineering Machinery Section, Xi'an Shannxi 710016, China

*Corresponding author: Lei Yu, BFTD23841@a163.com

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Abstract:

At present, the high-speed railway is an important part of modern transportation infrastructure, and steel rail is one of the foundation and key components of the high-speed railway. With the high-speed train running faster, the quality requirements of the rail are getting higher, and the rail grinding technology has become one of the important means to ensure the safety and stability of the high-speed train. In this paper, the application of rail grinding technology in high-speed railways will be deeply discussed.

Keywords:

High-speed railway
Steel rail
Grinding technology
Application

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1. Cause analysis of EMU lateral amplitude overrun

1.1. Rail light strip

High-speed railway as a high-speed, high-quality means of transportation, the noise and vibration generated by the EMU when running will have an important impact on the comfort of passengers, the stability of running and the operating life of track equipment. The rail light strip is one of the important factors. Rail light strip refers to a bright strip on the side of the rail due to long-term friction, which is very common in high-speed railway operations. The existence of a rail light band will cause the lateral amplitude of the EMU to exceed the limit, which will affect the running stability of the train. Therefore, the application of rail grinding technology in

this aspect is particularly important. First of all, there are two main reasons for the formation of rail light strips: (1) The friction on the side of the rail causes the metal particles on the surface to compact under the impact between the wheel and rail, which increases the surface hardness and gradually forms a bright band on the raised part; (2) The rolling of the wheel-rail, the interaction between the tire and the track will cause wear on the rim, which will lead to the rise of the rim, and the friction heat will cause the surface hardness of part of the side edge of the rail to increase, forming a bright belt ^[1]. The existence of the rail light belt will not only cause the transverse amplitude of the EMU to exceed the limit, but also increase the friction of the EMU on the track, and the wear of the track will be further aggravated, thus

affecting the operating life of the track equipment. In addition, the existence of rail light belts will also increase wheel-rail noise, which will cause trouble to residents along the line. In general, the rail grinding technology of high-speed railways has important application value in solving the rail light belt problem and is also an important means to ensure the safety of high-speed railway running and improve the operation efficiency.

1.2. Rail geometry

Rail geometry mainly refers to the size parameters such as the outline, height and width of the track. Its accuracy and stability directly affect the running state and safety of the vehicle on the track. First of all, the track geometry is one of the basic elements to ensure the safe and stable operation of the track ^[2]. In the process of high-speed railway design and construction, it is very important to accurately control and adjust the track geometry. When laying the track, once the track geometry is wrong, it is easy to lead to the lateral vibration of the train, the increase of noise and other problems, and even serious vehicle derailment accidents.

Secondly, the constant change of rail geometry is also one of the main reasons for the transverse vibration of the train. As an important component of high-speed railway, the rail will inevitably be subjected to a lot of use and wear, which will lead to the constant change of the rail geometry. The greater the change of rail geometry, the more obvious the lateral vibration of the train will be during running. To ensure the stability and safety of the track, rail grinding technology came into being ^[3]. By optimizing the geometry of the rail, the grinding technology can strengthen the structure and performance of the railway, thereby reducing the transverse vibration and noise of the vehicle during the running process, and improving the running speed and efficiency of the railway.

2. The function and characteristics of the rail

2.1. The basic structure and composition of the rail

The steel rail is one of the main components used to support the train wheels and transfer the wheel load on

the railway. It is composed of the upper pedal, the side plate, the rail head, the rail waist, the base and other parts. Among them, the upper pedal is the part that bears the train load, the side plate plays the role of anti-slip and lateral stability, and the rail head and the rail waist play the role of bearing the load and transferring the wheel load. The rail is mainly composed of high-quality steel and some other alloying elements, which can increase the strength and wear resistance of the rail. In addition, the rail also needs to be processed by heat treatment and other processes to ensure its quality and performance ^[4].

2.2. The function and characteristics of the rail

2.2.1. The function of the rail

(1) Bearing load: The rail is one of the main components of the railway to bear the load of the train, it can effectively transfer the wheel load and disperse it to the railway foundation, but also can withstand the longitudinal and lateral load of the train.

(2) Maintain the stability of the vehicle: As a supporting component of the train, the rail can play a role in maintaining the stability of the vehicle when the train is running, reducing the possibility of the train rollover or out of control ^[5].

(3) Ensure smooth running: The rail can directly affect the running stability of the train. For high-speed trains, the smoothness of the rail has a great impact on the operating efficiency and safety of the train.

2.2.2. Characteristics of the rail

(1) High strength: The rail needs to bear the huge load of the train, so it needs to have high strength and toughness, and can maintain its stability and performance for a long time.

(2) Strong wear resistance: Long-term running of the train will produce greater wear on the rail, so the rail needs to have strong wear resistance, and can maintain the smoothness of its surface for a long time.

(3) Good corrosion resistance: The rail has been in an open environment on the railway for a long time, and it needs to resist the influence of natural factors such as wind, sun, and rain erosion, so it needs to have good corrosion resistance to maintain its design life for a long time.

(4) High accuracy: The geometric shape and

dimensional accuracy of the rail have a very important impact on the running stability and operating efficiency of the train, so the processing and installation of the rail should ensure accuracy and rail size ^[6].

In general, the application of high-speed railway rail grinding technology is to ensure the smoothness and smoothness of the rail, so as to improve the operation efficiency and safety of the train. As an important component of the railway, the rail needs to have the characteristics of high strength, high wear resistance, and high precision to ensure its stability and long service life.

3. The advantages and problems of rail grinding technology

3.1. The advantages and limitations of rail grinding

High-speed railway trains travel at a high speed, and the train needs to brake frequently to accelerate, which leads to the friction between the train wheelset and the rail being very large, easy to make the rail surface wear and fatigue cracks, thus affecting the safety of operation. The rail grinding technology is to polish the rail surface and remove the surface of the pit, marks, and oxide layer, to extend the service life of the rail and improve traffic safety ^[7]. Specifically, the advantages of rail grinding technology are as follows:

- (1) Improve the finish and smoothness of the rail surface, reduce friction resistance, reduce energy consumption and save energy;
- (2) Optimize the shape of the wheel-rail contact surface, reduce friction and wear, and extend the service life of the rail;
- (3) Shorten the braking distance of the train to improve safety;
- (4) Reduce the noise emitted by the rail and improve the operating environment.

3.2. Existing problems and improvement directions of rail grinding

Although rail grinding has significant advantages, there are also some problems:

- (1) Grinding efficiency is low, and cannot meet the needs of high-speed railways. At present, the speed of manual grinding is relatively slow, and the working time

of each shift is long, which cannot meet the requirements of the actual working speed.

- (2) It is difficult to ensure the quality of grinding. Due to the manufacturing of machinery and equipment and the technical reasons of the operator, it is still difficult to ensure the quality of grinding, and it is easy to have differences and compound errors between different positions ^[8].

- (3) Grinding work will have adverse effects on the operation of passenger trains. At present, the grinding work can only be carried out at night, but this operation will still have some impact on the normal operation of the train, such as the train cannot overpass in the grinding section.

To solve these problems, improvements can be done on the following aspects:

- (1) Improve the machine and equipment to improve the grinding efficiency. At present, there is no targeted automatic grinding equipment for high-speed railway, it is necessary to improve the accuracy and speed of equipment while ensuring the grinding quality to meet the needs of high-speed railway operation.
- (2) Improve the grinding process and improve the quality of grinding. The precision and quality of grinding can be improved by introducing new processing technologies, such as laser grinding and plasma grinding and other methods.
- (3) Use more advanced materials. Develop more wear-resistant materials to make the rail ^[9], thus reducing the number of grinding and increasing the service life.
- (4) Achieve unmanned grinding. Through the introduction of intelligent technologies, such as artificial intelligence and machine vision, the automation and precision of rail grinding can be achieved, and the grinding efficiency and quality can be improved.

4. Rail grinding

4.1. Interpolation principle of the rail profile grinding mode application

High-speed rail is one of the main ways for modern people to travel, and it is the infrastructure for high-speed rail operation. Therefore, the quality and maintenance of the rail are of great importance. Rail grinding technology is one of the important links to ensure the safe and

smooth operation of high-speed rail. The rail profile grinding mode based on the interpolation principle is a common grinding technology.

4.1.1. Introduction of the principle

The interpolation principle is a method to obtain unknown data by interpolating known data, which can be used to grind the profile of the rail surface. Specifically, according to the preset rail profile curve^[10], the height difference of the rail surface is measured, and then the corresponding grinding height is obtained by the interpolation algorithm. Finally, the rail grinding equipment is used to perform the actual grinding operation, so that the rail can reach the preset profile curve. This grinding method has the advantages of high precision, high efficiency and wide application range.

4.1.2. Application scenario

The rail profile grinding mode of the interpolation principle is suitable for the situation where the rail surface height difference is large and the overall grinding is needed. For example, the newly installed rail has irregular height difference on the surface due to the processing accuracy and the reasons in the laying process; Or the old rail, in the long-term use of the surface is worn or scratched^[11] by foreign bodies, resulting in a large difference between the height and the height, the need for overall grinding.

4.1.3. Operation steps

- (1) Rail surface scanning: The use of professional scanning equipment to scan the rail surface;
- (2) Data processing: The scanning data is processed to obtain the height distribution map of the rail surface;
- (3) Profile curve setting: According to the actual situation, set the profile curve of the rail;
- (4) Interpolation algorithm calculation: The interpolation principle is used to calculate the grinding height of each point;
- (5) Grinding operation: According to the calculation results, the actual rail grinding operation;
- (6) Testing and verification: The surface of the polished rail is tested and verified to confirm that its profile curve meets the requirements^[12].

4.2. Application of rail rapid grinding mode

The rail is the core component of a high-speed railway, and its state is directly related to the smoothness and safety of the train. Therefore, the timely application of rail grinding technology is very important. Rail rapid grinding mode is an efficient rail grinding method, it uses professional equipment, and can quickly fix the rail surface defects and uneven grinding. The advantage of this grinding method is that it can not only improve the safety of the railway but also improve the ride experience of passengers and ensure the high-speed and smooth operation of the train. Specifically, the rail rapid grinding mode can be achieved through the following steps:

- (1) Equipment preparation: Rail rapid grinding requires professional equipment, including a grinding machine, grinding head, swing arm, etc., to carry out comprehensive inspection and maintenance to ensure that the equipment is in normal working condition.
- (2) Rail cleaning: Before grinding, the surface of the rail needs to be cleaned to better detect the surface condition and determine the part of the grinding.
- (3) Detection: Use professional testing equipment to detect the height difference and unevenness of the rail surface to determine the parts and depth that need to be smoothed^[13].
- (4) Grinding: According to the test results, select the appropriate grinding head, quickly grinding the rail surface, and grinding away the raised part and uneven part of the surface, so that the rail surface is smoother.

- (5) Inspection: After grinding is completed, it is necessary to carry out a comprehensive inspection to ensure that the rail surface has been completely polished without any defects or raised parts.

Through the rail rapid grinding mode, the smoothness of the rail surface can be significantly improved, and problems such as trains running stuck and bouncing caused by rail surface defects can be avoided. In addition, this grinding mode can be carried out quickly and efficiently, saving the time and energy of maintenance personnel. However, there are some problems and limitations with the rapid rail grinding mode. For example, this method is only suitable for rail with small surface defects, and for some dimples or raised parts with greater depth, other more professional grinding methods are needed. In addition, the rail

rapid grinding mode requires the use of professional equipment and operating skills, which also increases the maintenance cost and the professional skill requirements of maintenance personnel. The application of the rail rapid grinding mode is very wide and can be used not only for the maintenance and maintenance of high-speed railways but also for the maintenance of other types of railway equipment ^[14].

4.3. Application of rail profile grinding technology

(1) In the grinding operation, the rail grinding profile template should be used in time to check the grinding profile, and the portable profile instrument or vehicle profile detector should be used to detect the rail grinding profile. When the portable profile instrument is used, the top surface of the left and right strand rail is used as the positioning reference.

(2) Rail grinding profile detection: Data are processed every 1 km during on-board detection; while manual detection was conducted every 50–100 km with randomly selected lines and curves of 100 m each to detect the left and right strands of rail three places each.

Rail profile grinding technology is an important part of the field of high-speed railway maintenance. It refers to the processing of railway rail surface to make its profile meet the corresponding requirements. This technology can effectively extend the service life of the railway and improve the safety performance of the train. However, there are still some problems in the application of rail grinding technology. The advantages of rail profile grinding technology are mainly shown in the following aspects. First of all, it can effectively prevent the gap between the wheel and the rail from being too large, to avoid the risk of the train jumping during high-speed operation.

Secondly, rail grinding technology can also extend the service life of the railway and reduce maintenance costs. In addition, it can also shorten train operation time, and improve operation efficiency and safety ^[15].

However, there are still some problems in the application of rail grinding technology.

(1) The current rail grinding technology lacks precision and automation. On high-speed rail, vehicles move at very high speeds, so any slight deviation can pose a threat to driving safety.

(2) The cost of rail grinding technology is high, and the maintenance cost is large.

(3) The rail grinding technology also has the problem of low efficiency.

To solve these problems, the rail profile grinding technology applied now is divided into rail profile grinding mode application of interpolation principle, rail rapid grinding mode application, rail profile grinding technology application, and switch rail welding joint grinding technology application. The application of rail profile grinding technology can help us solve the problem that the railway rail shape accuracy is not high. After the application of rail profile grinding technology, the railway rail shape can be accurately treated. With the rail grinding equipment controlled by a computer, the rail can achieve higher precision and automation in operation, thus significantly improving the safety and stability of the train.

5. Conclusion

The development of high-speed railways is inseparable from rail quality assurance, and rail grinding technology is one of the important means to achieve rail quality assurance. Through the research of rail grinding technology, it can not only effectively reduce the transverse amplitude of EMU, but also extend the service life of rail and ensure the safe and stable operation of high-speed railway. Although there are some problems in rail grinding technology, it is believed that rail grinding technology will play a more important role in the construction of high-speed railways in the future by further strengthening technical research and improvement.

Disclosure statement

The author declares no conflict of interest.

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A Brief Discussion on “Applying Reality to Reason” in Inorganic Chemistry under the Background of Big Data Digital Age

Yanling Wu^{*}, Tong Lu, Qian Tang, Xinlei Zheng

College of Transportation and Civil Engineering, Shandong Jiaotong University, Jinan Shandong 250357

**Corresponding author:* Yanling Wu, zsgz@sdjtu.edu.cn

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Abstract:

With the continuous development of science and technology, the era of intelligent digitalization is also advancing, and the digitalization of education is also constantly following up. The experimental teaching part of “Inorganic Chemistry” is also deepening the dynamic curriculum goal of “giving reality to reason” because of the enabling role of intelligent teaching. In the exploration and reform of many educational practices, it was believed that the combination of theory and experiment innovation, innovation and intelligence can become an effective way to upgrade quality education.

Keywords:

Inorganic chemistry
Chemical equilibrium
Innovative combination of theory and experiment
Pragmatic
Innovation complemented by intelligence

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1. Introduction

Inorganic Chemistry is the civil engineering major represented by the majority of efficient students from “secondary school chemistry” to “university chemistry” transition “enlightenment discipline,” and inorganic chemistry has a strong modern characteristics, both differentiation and synthesis, therefore, discussing inorganic chemistry has become the majority of university education researchers to explore, practice, optimization and reform one of the important objects.

With the national major strategic deployment of “Made in China 2025,” “networking +” and “The Belt

and Road,” as well as the vigorous development of new industries and new economies characterized by intelligence, information technology and digitalization, new and higher requirements have been put forward for the training of talents in higher education. To this end, China’s higher education actively promotes the construction of “new engineering,” and has successively carried out and reached the “Fudan Consensus,” “Tian Da Action” and “Beijing Guide” and other consensus, and strives to explore and lead the Chinese experience and Chinese model of engineering education in the world, and help the construction of a powerful higher

education country^[1,2].

In the context of the continuous development of big data digitization, the continuous introduction of new intelligent models, educational methods, teaching content, and educational means are constantly innovated imperceptibly. The product of the intelligent digital era is expected to become a helpful assistant in the teaching of Inorganic Chemistry. However, most teachers are not familiar with intelligent teaching and have relatively professional information technology application ability, which means that even if teachers can realize that intelligent teaching means have positive teaching significance for curriculum reform, it is also difficult to effectively apply the corresponding teaching expression flexibly into the curriculum, and then achieve the development purpose of educating people by virtue and diversified teaching^[3]. In the teaching of Inorganic Chemistry, teachers are not only the imparts of knowledge, but also become the organizers and planners of the classroom. Teachers can create exclusive teaching content for each student with rich teaching materials and contents through artificial intelligence-assisted teaching and virtual interaction, to make the idealized teaching of “one person and many teachers” possible and deepen the “teaching according to student’s ability.” However, every coin has two sides. For example, universities have different opinions on the application of ChatGPT in education^[4]. Therefore, ways to flexibly, efficiently and dialectically use the handy tools endowed by the big digital age is the key to the upgrading of quality education.

2. The design and framework construction of the curriculum guidance program

Under the background of the digital era of big data, the traditional teaching model is no longer suitable for the development and training needs of modern talents. With the rise and development of new technologies, teaching methods are being “welcomed” step by step, especially digital applications, such as the flipped classroom, micro-teaching assistant, rain classroom and other emerging methods that are very popular among educators and education researchers. Digital teaching resources

refer to digital processing, can be run on the multimedia computer or network environment, and can realize the shared multimedia teaching materials^[5].

2.1. Course design method

2.1.1. The combination of online guidance and teacher-led teaching

Before class, teachers release online preview guide teaching or “pre-class guide” and preview videos through online software such as Rain Classm to help students grasp the preview task and the outline of the course as a whole, and think about ways to solve problems and achieve learning goals, to build an experiment framework before the experiment. In class, the teacher introduces the curriculum objectives and experiment planning and briefly summarizes the core knowledge, operation process, operation skills and expected results of the experiment. Students are free to form teams and explore independently, combined with the teacher’s face-to-face guidance, and finally form a method and system to solve the problem. After class, the students design the mind map, such as the summary of the experimental content, results and error analysis and the combination of theory and experiment, etc., timely summary and reflection of the problem-solving process, innovative design, improve the program, expand the research, to achieve the systematic, structured, drawing an analogy effect.

2.1.2. Experiment teaching

Teachers adopt experimental teaching with student inquiry as the main form. Teachers cultivate students’ independent learning ability of “independent preview, independent experiment and independent reflection” through the way of students’ inquiry so that students can actively and spontaneously improve their ability to think, solve and examine problems. In the course of the guided study, teachers can appropriately design clever “traps” when setting questions, to cultivate students’ questioning spirit and dig out their serious and practical research style.

2.2. Example of course design process - Chemical balance

2.2.1. Dig according to demand

Before the beginning of the course, reasonable and feasible teaching content should be selected according to the course needs, training objectives, and existing conditions of chemical balance. Taking the chemical equilibrium in the inorganic chemistry textbook as an example, based on learning the mass relationship and energy relationship in the chemical reaction, the three problems of the direction, rate and limit of chemical reaction are discussed emphatically. The theoretical concepts of equilibrium constant, activation energy, Gibbs free energy change of reaction, and entropy change of reaction in this chapter are used to solve the above three problems.

2.2.2. Guided design

Through online teaching platforms (such as Rain Class, micro-teaching assistant, etc.), teachers send course tasks and situational data in specific backgrounds to students, and set questions according to the corresponding scenarios: What is the spontaneous process? What are some examples of spontaneous processes in our daily lives? What are the effects of catalysts on chemical reactions? What are the applications of catalysts in production and life and in inorganic chemistry experiments? What are the factors that affect the rate of chemical reaction? What are the effects of chemical balance on production and life? What are the factors that affect the movement of balance?

The essence of the design of these questions is to let students with questions and tasks, independent learning online teaching platform-related resources, and to stimulate students to explore the interest of complicated questions and explore the ability of students to explore the unknown. For the questions that students find difficult to understand, teachers use the form of open online Q&A to discuss and communicate. According to the situation of the students, the teacher makes a preliminary assessment to determine the direction of topic selection, asks students to aim at one of the directions, and designs feasible experiment methods and schemes for the topic.

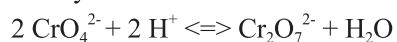
2.2.3. Experiment conception and experiment report writing

Change a factor acting on the equilibrium system, the equilibrium will produce a corresponding shift. If the

reactants or/and products are colored or precipitated, the equilibrium shift can be “observed” depending on the color change and the amount of precipitation. The teacher presupposes the experiment, and the students conduct their experimental exploration mainly in the form of group cooperation. The experimental reagents are as follows:

(1) Methyl orange is yellow in a base solution, whereas the transition color is orange, and red in an acid solution.

(2) Orange-red $\text{Cr}_2\text{O}_7^{2-}$ and yellow CrO_4^{2-} are balanced by H^+ .



Experiment selection case: Experiments 1–2 take a colored body as an example to illustrate the balance shift. Chemical equilibrium and its movement is a universal law, and whether the type body has characteristic color is not important. Experiment 3 is another typical example.

(1) Add 30 L potassium chromate (K_2CrO_4 , 0.1 mol/L) solution to each of the 6 clean test tubes. Test tube 1 was used as the control group. 3, 5, 9, 13, and 17 drops of 1 mol/L sulfuric acid solution were added successively in test tubes 2–6 and mixed well. The orange color indicated that the solution contained two types of CrO_4^{2-} and $\text{Cr}_2\text{O}_7^{2-}$. It is observed that the color in these test tubes is from yellow to orange-red, but the color change time is not the same. It follows that there must be a small amount of $\text{Cr}_2\text{O}_7^{2-}$ or CrO_4^{2-} in the yellow or orange-red solution.

(2) Adding $\text{K}_2\text{C}_2\text{O}_7$ solution to $\text{Pb}(\text{NO}_3)_2$ and $\text{Ba}(\text{NO}_3)_2$ solution, it is observed that yellow PbCrO_4 ($K_{\text{sp}} \sim 10^{-13}$) and BaCrO_4 ($K_{\text{sp}} \sim 10^{-10}$) are precipitated in the solution; Drop K_2CrO_4 solution into $\text{Pb}(\text{NO}_3)_2$, $\text{Ba}(\text{NO}_3)_2$ solution, and observe that yellow PbCrO_4 and BaCrO_4 precipitate in the solution. In the second experiment, yellow precipitates were also observed, which indicated that the $\text{K}_2\text{C}_2\text{O}_7$ solution contained CrO_4^{2-} type bodies. Since the content of CrO_4^{2-} in $\text{Cr}_2\text{O}_7^{2-}$ solution is small and the concentration is not large, it only meets the requirements of the precipitation of less soluble chromates, and does not meet the requirements of the precipitation of chromates whose solubility is not difficult to dissolve (such as SrCrO_4 , $K_{\text{sp}} \sim 10^{-5}$).

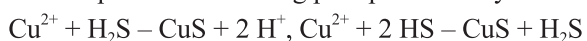
(3) Add BaCl_2 solution to 0.1 mol/L $\text{H}_2\text{C}_2\text{O}_4$

solution to obtain white barium oxalate precipitation; CuSO_4 solution was added to 0.1 mol/L H_2S solution to immediately obtain black copper sulfide precipitation. Why can precipitate be formed and why can precipitate be formed immediately in the second experiment?

Through a series of calculations, it can be seen that the concentration of 0.1 mol/L $\text{H}_2\text{C}_2\text{O}_4$ solution and H_2S solution is slightly less than 10-5 mol/L and 10-13 mol/L. Therefore, $\text{Ba}(\text{NO}_3)_2$ solution is added to the $\text{H}_2\text{C}_2\text{O}_4$ solution to obtain white BaC_2O_4 ($K_{\text{sp}} \sim 10^{-7}$) precipitation, which is consistent with both theoretical estimation and experimental phenomenon. Theoretically, when CuSO_4 is added, a precipitating reaction occurs immediately, and only a very small amount of copper sulfide ($K_{\text{sp}} \sim 10^{-36}$) is formed. However, before adding cupric sulfate solution, the concentration of S^{2-} in H_2S solution is only 10-3 mol/L, while the experimental phenomenon is that when CuSO_4 solution is dropped, an obvious amount of CuS is immediately produced.

When CuS formed in the solution and BaC_2O_4 precipitated, the pH of the solution gradually decreased, and the concentration of S^{2-} and $\text{C}_2\text{O}_4^{2-}$ in the solution also gradually decreased. If the solubility of precipitation is small enough, when CuS precipitation is formed, the decrease of pH is not enough to inhibit the precipitation reaction. When BaC_2O_4 precipitation is generated, the precipitation reaction will be incomplete. In the case that the amount of S^{2-} in the original solution is so small, the formation rate of CuS precipitation is fast and the precipitation amount is obvious. To solve this contradictory problem, it was discussed from two aspects:

(1) The solution contains H_2S and HS^- , and their ionization rate is very fast, can be very fast ionization to produce S^{2-} , so in the solution of original S^{2-} and Cu^{2+} combined to form precipitation, S^{2-} occurs supplement, consumption, and replenishment (all are instantaneous). The reaction process of forming precipitation may be:



(2) Before the experiment, the students can be divided into groups, and a group of 3 to 5 people is appropriate. The idea of the experiment is decided by the group, and the experiment is conducted by the group, to cultivate the students' independent hands-on ability and team negotiation consciousness. The layout of the

experiment report is filled out by the students themselves, and the suggested template or prompt words can be given to guide the students to establish the framework structure of the experiment process and stimulate the students' consciousness and potential of systemization and structure.

2.2.4. "Double" summary

Students conduct both online and offline "double" summaries. (1) Online, students can use mind mapping, video and other ways to conduct personal course summaries by reviewing the "combination of science and practice" in the experiment process to make a summary, talk about their perception and harvest, this part can be implemented to individuals; (2) Offline, the inadequacies and gains in the experiment can be analyzed and summarized dialectically utilizing discussion or free debate among group members through the experiment in class.

2.2.5. Feedback survey

Students mastery can be assessed by setting questionnaires or test papers, and students' feedback can be collected through exploitative bullet screens or offline message boards, which is conducive to the improvement of follow-up experiments, "thinking" and then "advancing."

3. Online and offline mixed teaching under the background of digital age

3.1. Advantages of online teaching

If offline experimental teaching focuses on guiding students' hands-on ability, online experimental teaching helps cultivate students' thinking expansion ability. In many online cloud classes, students can acquire and master more knowledge and resources than in offline teaching, which is wider and more convenient. It also breaks the constraints of time and space and is more conducive to the teaching of epidemics, bad weather, bad environment and other emergencies.

3.2. Digital experimental teaching means

The single teaching with only online teaching is putting the cart before the horse. The combination of online

and offline teaching is more conducive to stimulating students' interest in learning. Because of the problems found in the teaching process of inorganic chemistry experiment courses in colleges and universities, such as inadequate pre-class preparation, vague learning objectives, and experimental mistakes, teachers should make full use of "cloud classroom" and combine it with traditional teaching mode to form a complementary teaching mode, which not only provides a platform and guarantee for students' independent learning but also steadily improves the teaching quality of inorganic chemistry experiment courses. Shorten the teaching time of topics, provide theoretical basis and implementation space for students' hands-on practice, and effectively solve the drawbacks in the teaching of inorganic chemistry experiment courses^[6]. Encourage students to exert their subjective initiative, strengthen the spirit of ownership, and cultivate students' innovative thinking, comprehensive quality and interdisciplinary ability.

3.3. Digital experimental environment

As a chemistry laboratory, there is a pungent smell, and the environment is not as clean as other laboratories, because the usage rate is higher, and the laboratory management system is not as rigorous as other laboratories. The inflammable, explosive and corrosive chemicals in the laboratory make every part of the experimental environment have security risks. Being in this environment for a long time will cause potential threats to the physical and mental health of teachers and students. In terms of laboratory management, students can be given more autonomy, give full play to students' subjective initiative, professional advantages and their existing imagination, and appropriately change, arrange, design and manage the laboratory. This mode not only cultivates students' comprehensive qualities such as hands-on creation and management but also cultivates students' professional and technical abilities.

To create an excellent experimental environment, teachers should not only pay attention to the external environment and internal supply and demand but also have a good management system. Therefore, the construction of safe and green inorganic chemistry laboratories and scientific and efficient laboratory management is not only a necessary condition for

improving the experimental teaching level but also a necessary guarantee for optimizing the teaching quality. The digital experimental environment enables researchers to meet this requirement.

4. A new path of putting theory into practice - "One teacher teaches many"

Traditional teaching usually has some problems, such as being inflexible and single, and the students are easy to follow the text and do not think about its deep meaning. Therefore, the diversity, timeliness and innovation of teaching methods have become the focus of educators. The "many" of the so-called "one teacher teaches many" is reflected in the diversified curriculum design, diverse teaching methods, and many aspects of teaching content. It aims to guide students to solve the problems of "how to preview," "how to self-study," "how to quickly and accurately locate the unknown points in the course" and so on, and perfectly interprets the truth that "teaching people to fish is better than teaching people to fish."

4.1. Dynamic teaching

On the one hand, knowledge is not immutable, but a process of dynamic development. At first, the theoretical knowledge we learn from books is inherent in our thinking, and with the progress of experiments, the experiments carried out may have the possibility of verifying the original theory, deepening the original theory or even overruling the original theory to form a new theory. Therefore, taking dynamic teaching as the entry point is expected to realize "one teacher teaches many." Dynamic teaching is often accompanied by the monitoring of online platforms, through the release of phased tasks such as in-class tests, chapter tests, perceptions and other real-time understanding and attention to students' mastery and learning dynamics.

On the other hand, students are in a developmental state. Chemistry as a practical course, to learn inorganic chemistry well, not only requires students to have a correct learning attitude but also needs students to have a correct learning method. Therefore, dynamic teaching is also a teaching method to help students develop better learning habits and improve student's ability to adapt to the environment.

4.2. The reference to ideological and political elements in the curriculum

The implementation of moral education improves the quality of talent training to comprehensively promote the construction of curriculum ideology and politics is a major goal of the current curriculum design. Among them, the education of professional courses in colleges and universities is the most important thing to train future successors. To achieve this fundamental task, it is necessary to put forward clear requirements for the teaching mode of professional courses. In the process of knowledge imparts and ability training, students can be helped to establish a correct worldview, life and moral values. Professional knowledge can be traced to the development process of disciplines, to adapt to the development of the era ^[7,8].

If the ideological and political elements of the curriculum are simply and roughly integrated into it, it can be said that it is even more difficult, and it may reduce students' interest in learning in the classroom. In the curriculum, as a teacher, it is difficult to implement one thing, to integrate the ideological and political elements into the curriculum. Modern inorganic chemistry has developed so far, as the basic course of materials, electronics, and other aspects of inorganic chemistry, condensed a large number of domestic and foreign chemists and ancestors of the effort and wisdom, Pauling, Mendeleev, Madame Curie and other to obtain the truth for decades of continuous experiments, hard work cases, to combine the corresponding theoretical knowledge points with the stories of many scientists and the Party's educational policy, political ideas and patriotic feelings perfectly integrated, to cultivate students' scientific rigorous attitude, social responsibility and sense of mission, to solve problems in a variety of ways, as well as innovative thinking and other ideological and political elements ^[9].

4.3. Teaching students according to their aptitude

In the individual aspect, it is important to reasonably examine the advantages and disadvantages of students, such as if the student's practical ability is very good, but the logical thinking ability is relatively weak, teachers can encourage and guide more. In addition, in other

aspects, such as some groups or collectives, they can also be classified and then taught according to their aptitude. For students not majoring in chemistry or college of Chemistry, experimental courses can be reasonably arranged according to the different class hours, credit requirements and teaching standards of their majors or colleges ^[10].

Basic operation experiment and preparation experiments can be opened for all students, through a variety of experiments to improve students' ability, such as the preparation of potassium nitrate, aimed at training students to master the basic chemical operations such as weighing, dissolution, filtration, and so on, and then shape students' good experimental skills. Besides, relatively simple determination experiments can be set up such as the determination of dissociation degree and dissociation constant of acetic acid, to investigate and cultivate students' objective and rigorous scientific research spirit and attitude ^[11]. By understanding the working principle and correct use of common chemical instruments such as acid meter and spectrophotometer and other basic experiments, students can expand their knowledge of inorganic chemistry experiments and basic chemical literacy. Due to the accuracy and operation of the instrument may have a certain difference, then the measurement results may have a certain gap, to guide the students to carefully deal with the experimental data, analyze the experimental error, develop a scientific, pragmatic, rigorous experimental attitude and excellent style of study. For engineering and medical students, the preparation of ferrous ammonium sulfate and magnesium sulfate heptahydrate can be set up, to facilitate students to understand and master the laboratory preparation methods of these two industrial products, deepen the understanding of the relevant knowledge of the corresponding professional students, and help their correct use, to benefit the industry in which they are located.

For chemistry majors or chemistry college students, there are often unified teaching standards and class hours, and credit requirements, the school requires students to carry out the necessary experimental determination and basic experiment preparation process, add some experiments on the determination of elemental properties, independent design experiments and comprehensive

design experiments.

(1) Students in the specific operation of the elemental property experiment, by observing the change of color, precipitation, and gas generation, vividly understand the nature of various elements ^[12].

(2) For the independent design experiment and comprehensive design experiment, the comprehensive evaluation method and multiple teaching methods may be targeted and put forward higher requirements for the comprehensive application of students' knowledge and experimental skills.

(3) Students are not only required to accurately understand the experimental principle, but also to consult relevant materials and literature and obtain effective and usable knowledge, design reasonable experimental steps, carry out correct and standard experimental operations, solve various problems encountered in the experiment, and finally write a complete experimental report ^[9].

(4) For top-notch students who are interested in experiments and have strong hands-on ability, teachers can set up laboratories in different research directions, so that students can consult relevant literature, operate experiments, have a preliminary understanding of the current research status and relevant frontier knowledge, expand students' new knowledge, allow students to obtain relevant scientific research results in advance, and lay a solid foundation for future study and research.

5. Reflection and comprehensive evaluation of after-class teaching

5.1. Analyze the advantages and disadvantages of the course design process

Dialectically analyzing the advantages and disadvantages of the course design process should be considered in various aspects. For example, the goal of "integration of truth and reality," the scientific nature of "data processing" and "error analysis," the subjectivity of the dynamic change of "teachers" and "students," the flexibility of "teaching and learning" and "teaching methods," the integrity of "curriculum conception and evaluation," the development of "curriculum design keeps pace with the era," "students are the ones who develop," and so on. Dialectically and rationally viewing the course effect, analyzing the problems and improving

the problems is an effective means to promote the benign development of the inorganic chemistry target course ^[13].

5.2. Stage assessment and comprehensive evaluation feedback results

The experimental teaching adopts the process evaluation method (percentage system): Independent learning 20%; Experimental operation 40%; Paper theory score 20%; Experiment report 10%; Experiment safety 5%; Extended studies 5%. Evaluate from both macro and micro aspects, focusing on the overall effect while trying to implement the individual.

6. Conclusion

6.1. The deficiency of the current experimental teaching of Inorganic Chemistry

6.1.1. The traditional concept of experimental education has the risk of "complacency"

Is the default mode of "experimental purpose - experimental principle - experimental process - experimental conclusion" of "always so" right? When it comes to the process of experimenting, most students and even teachers can't help but blurt out this model. However, through the actual investigation, it is not difficult to find that the starting point of this model is to let students "do experiments" and "do experiments well," whether students personally participate in drawing inferential examples is still to be discussed, and may restrict students' innovation ability ^[14].

6.1.2. The construction of the teacher team needs to be improved

Most of the new forces of education teachers, although they are rich in learning and reading poetry and books, have a very credible teaching ability, but most of the new teachers are a little lack of teaching experience, the teaching mode is quite "solidified" traces, easy to fall into the traditional frame book cycle, cannot simplify complicated knowledge, from simple to deep, students are not easy to understand. In the new force, there are also some outstanding, it can be old and new, flexible grasp of teaching trends ^[15], understanding the students' learning situation and knowing the changing, which is what is needed.

6.1.3. The lack of teaching effect evaluation

Teaching evaluation, often from the subjective feelings of teachers lacks systematic and statistical evaluation, although the combination of online and offline teaching of the class has a certain improvement in performance but only the individual class, obviously lacks persuasion. Therefore, the parallel class design with larger data sampling and more scientific analysis of the learning process and learning effect is an effective way to test the effect of the combination of online and offline teaching in the inorganic chemistry experiment course teaching.

6.2. Outlook

The development of science and technology depends on talent, and the cultivation of talent depends on education. The background of the digital era of big data provides us with new opportunities. Teachers should evaluate the situation, rationally plan and make use of existing resources, and seize good opportunities^[10]. There may be the following solutions to optimize the course design:

(1) To strengthen the construction of college teacher teams, teaching and research activities can be actively carried out for new teachers, and inter-school and school-enterprise cooperation can be expanded.

(2) Realize the change of teaching concept. The original traditional teaching concept is changed to the new teaching concept under the background of big data, highlighting the main position of students, and aiming at amplifying students' subjective initiative and innovation enthusiasm.

(3) Greening the experiment. As an important part

of practical teaching, inorganic chemistry experiments should implant environmental protection concepts such as protecting the environment and reducing pollution into the minds of students, so that they can put environmental protection concepts in the first place in experiments and even in daily life.

(4) Realize the “upgrading” of the inorganic chemistry experiment teaching method, combine the traditional teaching mode, take its essence and discard its dross. Realize the transformation from a single offline teaching to a combination of online and offline teaching, realize the dynamic transformation between online and offline teaching, and constantly upgrade the teaching method.

(5) Innovate teaching quality evaluation methods. The traditional evaluation methods generally focus on “in class,” light “before class, after class” and other obvious deficiencies, so increasing the “pre-class preview” and “after class summary” link assessment proportion is the meaning of the problem. The comprehensive evaluation method of this paper can make up for the shortcomings of the traditional way.

(6) The proper use of the empowering tool of big data, reasonable design of inorganic chemistry experiment course process, let students be involved in it, implement the student-centered results-oriented education concept, which is conducive to the cultivation of students' independent learning ability, innovative thinking, environmental awareness, communication and coordination ability, teamwork and sharing accomplishment, etc.

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A Brief Discussion on Actively Promoting the Enrollment of Non-Permanent Staff in University Logistics into Trade Unions

Junying Zhou*

China University of Political Science and Law, Beijing 102249, China

**Corresponding author:* Junying Zhou, 58909061@cupl.edu.cn

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Abstract:

The membership of non-staff is the guarantee of the normal operation of logistics work so that employees have a sense of identity and belonging, to better tie the heart, retain people, keep talents, and avoid frequent personnel flow. Joining the trade union can better safeguard the rights and gain benefits. To promote help and assistance work, better serve people's livelihood, promote social harmony and stability, and build a harmonious campus.

Keywords:

Colleges and universities
Logistics
Labor unions
Non-roster employees

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1. Introduction

With the gradual deepening of the socialization reform of logistics in colleges and universities, after the independent accounting of logistics entities, they should not only strictly control the establishment of regular workers, reduce the cost of human resources, but also provide powerful logistics support services for the booming cause of higher education. Therefore, college logistics began to gradually hire a large number of non-regular employees, most of whom are young people. They are gradually becoming the main force of college logistics management and service and even the new force of backbone posts, with an increasingly large team^[1].

Following the ACFTU's requirements of "where

there are workers, it is necessary to establish trade union organizations," "organize them into trade union organizations to the maximum extent" and "organize to effectively protect their rights," all colleges and universities across the country have taken the work of joining and protecting the rights of non-enrolled personnel as an important part of the performance of trade union duties^[2]. In this brief introduction to the university logistics non-staff membership work.

2. The composition of non-staff

As far as the logistics system of colleges and universities is concerned, the non-staff staff is relative to the original

personnel of the cause before the socialization reform of logistics, that is, the “new” in the “old way, new way”. As non-staff, they do not account for the school establishment, the former popular called “temporary workers,” refers to the term of use not exceeding one year of temporary, seasonal employment, it is a form of employment corresponding to fixed workers, and contract workers^[3]. With the promulgation of the “Labor Law” and the full implementation of the labor contract system and the increasing maturity of the labor market, the so-called “temporary workers” and “regular workers” no longer exist, and the concept of “temporary workers” has withdrawn from the stage of history. Instead, it is the non-regular employees agreed in the form of labor contracts. Some special talents need to be hired by the school, which is called “school employment” by the personnel used and managed by the logistics entity. Some personnel who are employed, used and managed by the logistics entity themselves are called “self-employment.”

The non-on-staff of college logistics mentioned in this paper is a relatively broad concept, which refers to all non-on-staff employed in the form of labor contracts in the college logistics department engaged in catering, water and electricity, greening, cleaning, maintenance, security, and other kinds of work^[4].

The main composition of non-regular employees is mostly migrant workers. In the past, this part of the staff was generally low in cultural quality, relatively young (30–45 years old), most of them have heavy family burdens and are the main economic pillar of the family. To pursue a higher quality of life, they work in the logistics of colleges and universities with a better environment, are more satisfied with stable and reliable wages and incomes, cherish their jobs, obey management, work hard, and unite and help each other in the work, but they have a low education level, lack of awareness of organization and legal awareness, and have low awareness of joining trade unions and low enthusiasm for membership, and are easy to follow blindly. At present, many of the non-enrolled employees are the only children of the family with better conditions, and many of them have received higher education. They have a broad vision, active thinking, pursuit of progress, and a certain sense of legal consciousness and rights protection. They have a strong sense of identity with

the trade union, and most of them are willing to join the trade union organization^[5].

Another part of the non-regular employees are laid-off workers from former state-owned enterprises. This includes both laid-off workers and a small number of people who have been engaged in management or technical work in the original unit. They are generally older (most of them are over 50 years old) and have a strong desire to pursue work again. However, due to their older age and single skills, they are mainly engaged in chores, cleaning, greening, guard duty, and other work. These workers have a strong sense of organization and discipline, with a good quality of working-class responsibility and discipline^[6]. They know how to rely on trade union organizations to protect their rights and interests, and there is a high demand for membership.

2. Current situation of non-working staff

2.1. A large number of employees, wide distribution of posts, and low overall quality

Take the logistics department of a school as an example, there are 6 independent accounting entities in the logistics, of which there are 142 formal employees and 572 informal employees, accounting for 80.1% of the total number of employees in the entity. The positions of informal employees are distributed in various departments such as food, property, transportation and early childhood education. Most of them work in front-line positions except for a few engaged in management and technical work. There are 406 migrant workers, accounting for about 71% of non-regular employees.

2.2. Market liquidity is strong, driven by obvious interests, and the turnover rate is high

The emergence of non-regular staff is the product of the development of the market economy, which is not only a manifestation of the role of the market in allocating human resources, but also the result of the two-way choice between individuals and employers^[7]. With certain market volatility, it conforms to the law of talent flow in the labor market. It is not only one of the ways of human capital investment but also optimizes the allocation of logistics talents in colleges and universities. Compared with the establishment staff,

the non-employment staff itself does not have a stable labor relationship, and the labor relationship is in the form of a contract. Therefore, they are generally unable to enjoy the social welfare of career establishment employees, so they pay less attention to social welfare, working environment, interpersonal relationships, career development potential, and other factors, and often pay more attention to the actual salary at present.

2.3. High salary flexibility and no stable labor relationship

The salary level of non-regular employees is subject to two constraints^[8]. In terms of the general environment, the salary of non-employed employees is greatly affected by their supply in the labor market. For employees with common skills whose supply exceeds demand in the human resource market, their salary level should be consistent with the market price due to the strong substitutability and high price elasticity of similar personnel in the talent market. In a small environment, the salary of non-regular employees is also affected by the logistics policy of the school. The policy orientation and tendency of the school towards logistics directly affect the policy orientation of the logistics entity providing service guarantee for the school, which will inevitably affect the compensation orientation of the logistics entity towards the non-staff.

3. The importance and urgency of non-staff joining the association

3.1. Membership of non-enrolled employees is necessary for comprehensively promoting the construction of a strong country and national rejuvenation

The 14th National Congress of Trade Unions of China clearly defined the working class status of migrant workers in cities^[9]. The 18th National Congress of China's Trade Unions pointed out that we should "strive to safeguard the labor and economic rights and interests of the masses of workers," "promote the equal access of migrant workers to basic public services in cities and towns," and "actively promote the construction of harmonious labor relations"^[10].

3.2. The union membership of non-enrolled employees is required by the duties of university trade unions

Trade unions in China are the bridge and bond between the Party and the masses. "Trade unions should adapt to the new situation of the development and growth of the workforce, innovate their organizational forms, expand their coverage and enhance their cohesion, and incorporate workers into trade unions in the broadest possible way." Safeguarding the legitimate rights and interests of the faculty and staff, including non-staff members, is the need to fully mobilize and give play to their enthusiasm and creativity, promote the reform, development, and stability of colleges and universities, but also to strengthen the Party building, close the connection between the Party and the faculty and staff, and consolidate the Party's class foundation and ruling position. However, in reality, there are still some non-staff members who fail to join the association in time. There are both subjective reasons and objective factors. Most of them are eager to join an organization that can safeguard their interests. It is very necessary and urgent to realize the full coverage of trade union organizations^[11].

3.3. Membership of non-working staff is needed for the development of college logistics

With the improvement of the logistics reform of colleges and universities, the decisive role of the market in the allocation of resources is further played, the proportion of non-staff in colleges and universities is gradually expanding, and their status in the construction and development of universities is becoming more important, and their role is becoming more and more prominent. Some non-staff in the logistics system have accounted for more than 90%, and many outstanding talents have taken leadership positions through their work performance. Without them, the logistics security of colleges and universities will fall into "paralysis"^[12]. Establishing stable labor relations, absorbing them into the association, and fully mobilizing and giving play to their enthusiasm and creativity will be an effective way and measure for accelerating the construction and development of the university, and it is also an inevitable requirement for the development of college logistics

and social progress. It is the social responsibility of the university trade union to respect and understand the workers as their parents' family.

3.4. Membership of non-regular staff is necessary to improve their comprehensive quality

Absorbing non-staff members into the association is one of the basic ways to improve their comprehensive quality, and also to provide quality for higher education. The inherent requirements of logistic support service. Joining the trade union organization can make the non-working employees feel their personality is respected so that they have a sense of belonging, they are also the masters of the department and have a way to protect their rights, and the enjoyment of welfare. Besides, it also allows participation in activities, significantly enhancing the sense of ownership. In case of conflicts between non-employees and their employers, the trade union will be their backstop. In the event of a major incident between themselves and their families, the trade union is their guarantee and they can receive care from the trade union. In this way, they can better anchor the heart, retain people, avoid the frequent flow of non-staff, make the staff fixed, and better complete the work task. Trade union organizations can also make full use of this platform to train non-staff in aspects such as professional ethics, business skills, laws and regulations, enhance business ability, improve service level, and better provide high-quality logistics support services for the cause of higher education ^[13].

4. The membership of non-enrolled employees

4.1. Establishing a trade union for logistics non-staff

College logistics according to the situation of the department, according to the "trade union law" and "trade union regulations," the establishment of logistics three levels of trade union. The so-called three-level trade union is the school trade union for the first-level trade union, the establishment of the secondary trade union of the logistics department under the approval of the school trade union, the secondary trade union of the logistics

department approved the establishment of the tertiary trade union of the logistics entity. Through the party organization of each logistics entity, according to the "School Trade Union election Measures," the election of all members was conducted to elect the chairman of the trade union and the committee members of the third-level trade union of the entity, and carry out the division of work, and equip the trade union staff neatly. After the establishment of the third-level logistic trade union, the system and organization should be established on time to carry out the work of the trade union smoothly. Non-regular employees should be encouraged to join trade unions voluntarily ^[14].

4.2. Improve the system of fund receipts and expenditures of third-level trade unions

The logistics third-level trade union should have the support of welfare and activity funds, improve the revenue and expenditure management of the logistics third-level trade union, standardize the use of trade union funds, and formulate the Measures for the Management of fund and expenditure of the logistics third-level trade union according to the relevant provisions of the Trade Union Accounting System and the relevant requirements of the Federation of Trade Unions in the Notice on Fund Matters related to the grass-roots trade union to carry out condolence activities. First of all, the income source of the funds is stipulated: after the non-regular employees voluntarily join the trade union, they will voluntarily pay the trade union membership dues according to five-thousandths of the total wages. The funds for trade union activities shall be drawn by the unit that establishes the three-tier trade union organization according to 2% of the total wages of the non-regular employees in the previous year. The welfare expenses of the trade union shall be drawn by the unit establishing the third-level trade union according to the number of non-regular employees in the previous year at a rate of 20 yuan per person per month. The fund shall be uniformly managed by the logistics finance department ^[15]. The expenditure requirements of funds are formulated, and the expenditure of funds should be in strict accordance with the requirements of the financial system of the university. The logistics three-level trade union solved the problem of fund income and expenditure, and also better solved the problem

of condolence, welfare, and fund organization of activities for non-staff. On this basis, it also increases the enthusiasm of non-staff to voluntarily join the logistics third-level trade union. According to statistics, the number of non-staff members in a school can reach more than 90%.

5. The role of non-staff members to join the union

Solving the university logistics of non-staff membership work will allow the non-staff to truly realize the “five maintenance”:

(1) To safeguard political rights, non-staff members enjoy the same rights as staff members to participate in advanced evaluation and democratic management

In some colleges and universities, non-staff logistics staff can be hired to department-level management posts, fully mobilizing the enthusiasm of outstanding non-staff work, so that they have more room for promotion in the work. In the advanced evaluation, all employees are carried out together, and the “post model” and “work expert” are evaluated in the “post-training” activity. The number of non-assigned employees is more than that of assigned employees. In “Quality Service Month,” through participation in the unit recommendation, online voting, teachers and students scoring and other links, selected the “excellent team,” “service star” and other awards, many of the award-winning personnel are working in the front-line positions of the non-staff.

(2) To safeguard labor rights, the logistics third-level trade union guided non-employees to sign labor contracts with the unit

Professional lawyers were invited to organize training on Labor Contract Law and other related knowledge for non-employees so that they had the consciousness of signing labor contracts. They have an awareness of labor safety protection, and protecting rights in case of labor disputes. For example, when labor contract disputes occur at work, they know that there is a trade union organization that can actively cooperate and coordinate to solve disputes for them. It better protects the labor rights of non-working employees from being infringed.

(3) Safeguard economic rights and urge the

employer to pay various insurance premiums and pay wages in full and on time for non-working employees

This ensures that they receive the economic remuneration on time according to the contract during the working period. After entering work, it is necessary to pay various social insurance for non-employees on time. The units with conditions or high-risk jobs provide commercial insurance for non-employees to supplement the social insurance and ensure that they can get economic compensation in case of accidents.

(4) Safeguard the right to health, and supervise the employment unit to provide a safe working environment and working conditions for non-working employees

This provides free health examinations for employees on time during the entry and work period. Actively create a safe working environment to ensure the physical and mental safety of employees at work. Provide good accommodation conditions for those who have conditions and need accommodation to ensure that employees are full of spirit at work and can better complete their work.

(5) Safeguard the right to study, support and encourage non-staff based on the position, self-study

This encourages non-staff to participate in all kinds of training and learning, such as professional skills and cultural knowledge learning. Reward or reimburse tuition fees for employees who have achieved excellent academic performance, and promote and reuse those who have achieved excellent academic performance.

By effectively safeguarding the legitimate rights and interests, continuously enhancing the sense of identity and belonging of non-working employees, and better mobilizing the initiative, enthusiasm and creativity of non-working employees in college logistics services.

Logistics unions in colleges and universities should actively promote the implementation of the national policy on non-staff, safeguard their legitimate rights and interests according to law, try their best to help solve the practical difficulties of non-staff in work and life, and improve the environmental conditions of their work and life. This actively promotes the fixed-point assistance work for non-staff, and contributes to the establishment of a harmonious campus in serving the people's livelihood and promoting social harmony and stability.

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An Exploration of the Interactivity between Ancient Capital Nanjing and Local Music

Ye Zhou*

Communication University of China, Nanjing, Jiangsu Nanjing 210000

*Corresponding author: Ye Zhou, zdonghuacollege@163.com

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Abstract:

The special cultural ecological environment endows the ancient capital of Nanjing with a large number of rich connotations and obvious characteristics of local music culture. This paper attempts to learn from the research methods of cultural ecology, select Nanjing Baiju and Liuhe Flower Tune as typical samples, comparative analysis, and explore their interaction with Nanjing native music, for the follow-up sustainable development of traditional music culture (including intangible cultural heritage) to seek a new theoretical vision, open up new ideas of inheritance.

Keywords:

Nanjing
Local music
Interactivity

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1. Introduction

As one of the four ancient capitals of China, Nanjing is known as the “Ancient Capital of Six Dynasties” and “City of Ten Dynasties.” Jinling is the ancient name of Nanjing, and is an important birthplace of Chinese civilization, in the history of the four ancient capitals of China has been blessed several times is the four ancient capitals of China has never been the capital of foreign powers is regarded as the revival of the Han people, has a special status and value in Chinese history, has a profound impact on the course of Chinese history, the south crossing enables the Han nationality to preserve the Chinese culture in Jinling, which has been read through the ages ^[1]. Jinling is a representative city of Chinese

classical culture and elegant culture, a symbol of classical Chinese civilization, known as “the world’s literary hub,” Jinling and Rome are known as “the world’s two major centers of classical civilization,” Jinling culture in human history has had a profound impact.

As the capital of Jiangsu Province, Nanjing has rich musical and cultural relics. As early as in “Chinese Folk Song Collection · Jiangsu Scroll,” “Chinese Quyi Music Collection · Jiangsu Scroll,” “Chinese National Folk Instrumental Music Collection · Jiangsu Scroll,” Nanjing native music such as Nanjing Baiju, Jinling Qin School of Guqin art, Liuzuo blowing music, Gaochun folk songs, Nanjing Pinghua and so on have been recorded. Most of them have since become the

provincial or national intangible cultural heritage ^[2]. Nanjing native music, as the name suggests, refers to the traditional music that originated in the ancient capital Nanjing. According to the genre classification of traditional music in Introduction to Folk Music published by the Music Research Institute of the Chinese National Academy of Arts in the 1960s, the current academic circle still uses the five-part method, that is, folk songs (including ancient songs), rap music, opera music, folk instrumental music, song and dance music. However, “Since the singing part of the traditional ethnic song and dance music usually overlaps with folk songs in genre and repertoire, the classification of four genres (namely folk songs, rap, opera and instrumental music) has been formed based on the original five categories of genre classification.” The description of Nanjing native music in this paper will still be carried out according to the five categories of genres ^[3]. Nanjing native music covers many genres such as Nanjing Baiju, Liuhe Flower Tiao and so on. According to incomplete statistics, as of 2015, Jiangsu had 108 items on the national intangible cultural heritage list, 369 on the provincial intangible cultural heritage list and 1,424 on the municipal intangible cultural heritage list. Among them, there are 4 national-level intangible cultural heritages related to Nanjing’s local music, such as Nanjing Baiju and Guqin art (Jinling Qin School); 19 provincial-level intangible cultural heritages, such as Liuhe Liuzuo blowing and percussion music and Gaochun folk songs; And 19 municipal intangible cultural heritage items, such as Gucheng Ten Fan gong and drum, Xishan folk songs, etc. Most of them, which once flourished because of their long history and colorful performance pieces, are now facing unprecedented difficulties amid rapid economic growth, transformation and continuous urbanization. This paper attempts to learn from the research methods of cultural ecology and chooses Nanjing Baiju and Liuhe Flower Tune as typical samples to conduct comparative analysis and explore their interaction with Nanjing native music, to seek new theoretical horizons for the follow-up and sustainable development of traditional music culture (including intangible cultural heritage culture) and open up new ideas for inheritance ^[4].

2. The origin of cultural ecology

In 1955, American cultural anthropologist J. H. Steward proposed the concept of “cultural ecology” for the first time in his representative work “The Theory of Cultural Change: Multi-Line Evolution Methodology,” to explore the sources of special cultural characteristics and cultural patterns with regional differences. The theories and concepts of cultural ecology are mainly used to explain the process of cultural adaptation to the environment, considering the influence of natural conditions such as mountains, rivers and oceans, the residence of different nationalities, the environment, the previous social concepts, the new concepts popular in real life, and the special development trend of society and community, etc. They all provide special and unique occasions and situations for the generation and development of culture. Cultural ecology advocates studying the law of culture generation and development from the interaction of various variables of man, nature, society and culture to seek the special appearance and pattern of cultural development of different nations. Although Steward laid a solid foundation for the development of “cultural ecology,” his theory pays great attention to “the influence of environment on culture, and how the existence and operation of culture exerts a counter-effect on the surrounding environment, which he inadvertently neglects” ^[1,5]. Therefore, there is a certain one-sidedness in the theory. In the later related studies, people have a more comprehensive understanding of “cultural ecology,” and believe that cultural ecology should also include social environment, that is, cultural ecology is composed of economic environment, natural environment and social organization environment. In recent years, the research methods of cultural ecology have been greatly applied in many fields ^[6], such as tourism development, intangible cultural heritage protection, folk music inheritance, and the comparison of Chinese and Western cultures. The multi-dimensional consideration of traditional music culture in its natural and human ecological environment can provide a systematic and innovative understanding of various historical reasons for the rise and fall of culture. This paper attempts to learn from the research vision and method of cultural ecology to explore and analyze its interaction with Nanjing native music (including intangible cultural heritage culture), and seek

a new theoretical vision for its subsequent sustainable development.

3. The interaction between Nanjing's cultural ecology and local music

Nanjing, one of the four ancient capitals, known as Jinling and Jiankang in ancient times, is located under the Yangtze River in the southwest of Jiangsu Province. It is a hilly area of Ningzhen with low hills and gentle hills^[7]. Qinhuai River, Jinchuan River, Xuanwu Lake, Mochou Lake, Baijia Lake, Shijiu Lake, Gucheng Lake, Jinniu Lake and other large and small rivers and lakes, the water area of more than 11%. In addition, Nanjing is also the only city in the lower reaches of the Yangtze River with cross-river development, rich in mountains and rivers and green land resources, known as "dragon and tiger." The main city and its surroundings are Zhong Shan, Fugui, Jiuhua, Jilong, Wutai and Qingliang Mountains from east to west, Qixia, Wulong, Shogunate, Lion, Siwang and Siming Mountains from the north to the west, and Qinglong, Huanglong, Yuhuatai, Niusou and Zutang mountains from the east to the south. The outer areas include Pingshan Mountain and Lingyan Mountain in the north of Liuhe, and East Lushan Mountain and Wuxiang Mountain in Lishui. The favorable time and geographical location created the special status and value of Nanjing in Chinese history. Successively, the Eastern Wu, the Eastern Jin, the Song, Qi, Liang and Chen of the Southern Dynasties established their capitals here. As one of the first historical and cultural cities announced by The State Council, Nanjing has a history of more than 400 years as a capital, with rich natural landscapes and historical relics^[8], among which the intangible cultural heritage is an integral part of the historical context of Nanjing, and the local music is also an important component.

The special ecological environment has endowed Nanjing with a large number of local musical and cultural relics with rich connotations and obvious characteristics, and most of them have successively become intangible cultural heritage at different levels. According to incomplete statistics, as of 2015, Jiangsu had 108 items on the national intangible cultural heritage list, 369 on the provincial intangible cultural heritage

list, and 1,424 on the municipal intangible cultural heritage list. Among them, there are 4 national-level intangible cultural heritages related to Nanjing's local music, such as Nanjing Baiju and Guqin art (Jinling Qin School); 19 provincial-level intangible cultural heritages, such as Liuhe Liuzuo blowing and percussion music, Gaochun folk songs and Nanjing Pinghua; And 19 municipal intangible cultural heritage items^[9], such as Liuhe Flower melody and Xishan folk songs, totaling 42 items. However, if the popularity inside and outside the province is considered, the local music genres that are well recognized at present are Nanjing Baiju in Qinhuai District and Liuhe District Flower Tune. These two different genres, which belong to Quyi and folk song also strongly show the interaction and integration with the cultural ecological environment of Nanjing^[10].

3.1. Nanjing White Bureau

It is the only dialect rap art in the Nanjing area, and it is also the first batch of Baiju selected as the national intangible cultural heritage. It was formed in the Yunjin Room at the end of the Yuan Dynasty, and it is a way for Yunjin workers to enjoy themselves in their leisure life. According to legend, in the past, the performance did not take remuneration^[11], so there is a saying "white singing one game," hence the name "Nanjing White Bureau." The accompaniment of Nanjing White Bureau mostly adopts Jiangnan silk and bamboo instruments. Because it speaks authentic Nanjing old dialect, sings folk songs of Ming and Qing Dynasties, and polls in Jiangnan, the performances involve all aspects of Nanjing people's life, such as the beautiful scenery of Jinling, Qinhuai food, historical legends, festival folklore, dialect slang, etc., so it is known as the Encyclopedia of Nanjing folk culture. It has made great historical contributions to the study of Nanjing's humanistic customs. In form, Bai Bai uses pure Nanjing dialect to chant Bai Bai, while singing with very distinctive Qupai lyrics, such as "Yu Mei," "Scissors and Flowers," "Manjiang Hong," "Silver Willow," "Dressing Table," "Qing Ban," "Eight Ban," "Flowing Water," "Nine chain," "Roll Ban," etc.^[12], the melody is graceful and beautiful, full of Jiangnan characteristics. The accompaniment of Bai Bai is mainly composed of bamboo instruments from south of the river, such as bamboo flute, three strings, erhu

and pipa, and supplemented with percussion props such as drum, plate and wine cup. The performance is very lively and interesting^[1]. The performance involves all aspects of Nanjing people's lives, such as the beautiful scenery of Jinling, Qinhuai food, historical legends, festival folklore, dialect slang, etc. Therefore, it is known as the encyclopedia of Nanjing folk culture and has great historical contributions to the study of Nanjing's humanistic customs. Among them, the use of the Nanjing dialect is a major feature of Baiju. Nanjing dialect refers to the old saying in the southern part of Nanjing city. The term "South of Nanjing City" can be traced back to the Ming Taizu period, when the south of the old city with Confucius Temple as the core, east and west to the city wall, south to the Zhonghua Gate, north to Baixia Road, is the densest area of Nanjing residents, which continues to this day, known as "South of the Old City," including the famous areas of Nanbao Hall, Bull market, Old men East, Old men West and so on^[13]. From the history of Baiju art, it can be seen that Nanjing's unique natural environment and cultural environment are inseparable from the rise and development of Baiju, and the two coexist and grow together.

3.2. Liuhe Flower tune

Different from Nanjing White Bureau, "Flower Tune" belongs to the folk song genre^[14], and its important place of spread -- Liuhe, also has unique cultural and ecological characteristics. In ancient times, Liuhe was called "Tang Yi" and another name was "Ancient Tang." In ancient times, the northern part of Liuhe was hilly, and the southern part was a gentle water village polder area. However, no matter the water village in the mountains, there were birch apple pear trees and yellow pear trees everywhere, and pear flowers were in full bloom like snow in spring. According to legend, the manuscript handed down by the grandfather of the folk artist Li Yunlong, there were "Twelve Red" earlier, that is, twelve months a year, choose a red flower for singing content. However, "Twelve Red" was lost in the inheritance, and it evolved into a "Flower Tune" dominated by white flowers. The first line of the song is "What a jasmine flower," followed by "What a honeydew flower," "What a gardenia" and so on^[2]. From the regional analysis, this is related to the natural environment and folk customs.

Liuhe people prefer pear flowers and other white flowers, which is caused by the state of mind of environment and region nourishing, and is the unique aesthetic tendency of the region. "Jasmine" is the first verse in the mother body of "Flower Tune." "Jasmine" and "Mu Li" (Liuhe refers to pear tree in local language) belong to the same family, have similar flower shapes and harmonious words. This may be the reason and root of the loss of "Twelve Red" and the spread of "Flower Tune" with Jasmine as the chief white flower as the singing content. Later, according to legend, in 1957, He Fang, a literary and artistic soldier of the New Fourth Army, changed and processed the "Flower Tune" collected in the Baibai Jinniu area during the Anti-Japanese War, discarding other flower lyrics in the "Flower Tune," only retaining the first verse "A good Jasmine flower" without major changes in the original tune, and named it "Jasmine Flower." After the revision, it became a classic song, which enjoys great fame at home and abroad and has been sung to this day. "Flower Tune" is widely spread in Liuhe, with obvious regional brand^[15]. First of all, the words are not only indifferent, simple and simple of Jianghuai, but also soft, delicate and lyrical of Jiangnan. In the language, there are strong characteristics of Liuhe dialect, such as Hua (huo), it (tuo), cursing (mo), etc., are the rhyming ruts of closed local pronunciation. It can be inferred that since the Liuhe area suffered from wars and droughts and floods in Chinese history, people long for a peaceful and indifferent life, so the choice of plain flowers such as jasmine in the lyrics also reflects the kindness and honesty of the native people. By loving flowers and cherishing them, they express the mentality of loving nature, loving life, cherishing life, and yearning for peace and happiness. From the above analysis, it can be seen that Liuhe flower melody not only has rich historical memory but also harmoniously integrates with the local nature, folk customs and folk customs, which is worthy of being the product of the unique cultural ecological environment of Liuhe.

Slightly different from Nanjing Bai Bureau, the research on Liuhe flower melody mainly focuses on the change of melody and its law exploration. For example, Differences in the application of melody of "Jasmine" (Yuefu New Sound, 2009, No. 2), the Evolution and Artistic Value of "Flower Tune" (National Art, 2012, No.

2), Application, Variation and Regularity of Quangang North Guan's "Singing Song" to "Flower Tune" and "Meng Jiangnv Tune" (Chinese Musicology, 2015, No. 1). Using the methods of ethnomusicology empirical research and comparative research, this paper probes into the past and present life of Liuhe flower Tune and its congener tunes, which plays a positive role in clarifying the musical form (rotation, structure, etc.) of this genre.

4. Conclusion

To sum up, Nanjing Baiju and Liuhe Flower Tune, which are highly recognized in Nanjing native music, are

selected. Although they belong to two different genres, namely folk music and folk song, they are closely related to the local cultural ecology through comparative analysis based on the natural environment, economic environment, and social organization environment of the place of origin. Local music and local cultural ecology can be said to be rooted in each other and mutually integrated. The research vision and methods of cultural ecology undoubtedly open up a new way of thinking for us to explore the sustainable development and inheritance of traditional music culture (including intangible cultural heritage).

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Exploring the Application of Micro-lessons in Graphic Design Teaching in Higher Vocational Education

Xiaofei Yu*

Jiangsu Vocational Institute of Commerce, Nanjing Jiangsu 210000, China

*Corresponding author: Xiaofei Yu, sjmzb@163.com

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Abstract:

In the Internet era, micro-courses have injected vitality into the teaching of graphic design in higher vocational colleges. It can not only explain the operation process of various graphic design software dynamically, but also introduce excellent design cases, stimulate students' design inspiration, and help improve the teaching quality of graphic design. Graphic design teachers in higher vocational colleges should broaden the teaching channels of micro-class and link up the links before, during and after class; Use micro-class to create interesting situations to promote the connection between post skills and teaching content; Meticulously record graphic design software operation videos to explain the steps of drawing revision and design in detail, to improve students' graphic design ability; Micro-classes link theory and practice classes to build an integrated teaching model of science and practice; The school and enterprise jointly develop teaching micro-courses, build digital teaching resource database, further enrich teaching resources, and improve the teaching quality of graphic design micro-courses in higher vocational colleges.

Keywords:

Graphic design in higher vocational colleges
Micro class
Design principles
Current situation and countermeasures

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1. Introduction

Micro-class length is usually 5–10 minutes, the content is refined, the language is concise and comprehensive, and the key and difficult points of teaching are explained dynamically. It can integrate text, pictures, mind maps, video, etc., which is conducive to students' independent learning combined with video, further improve their independent learning ability, and help teachers

optimize the introduction of classroom links and create a diversified teaching situation. To better link up the teaching inside and outside the classroom to improve the quality of teaching. Vocational graphic design teachers should actively learn the production of micro-lessons, select micro-lesson materials according to the teaching content, integrate excellent graphic design cases into the teaching, expand the teaching content, stimulate students'

design inspiration, and encourage them to try diversified graphic design styles. They can also use micro-lessons to record Photoshop, Adobe Illustrator and other software operation videos to facilitate students to learn software operation according to micro-lessons, further improve their practical operation ability, and lay a good foundation for their future employment.

2. Micro-course design principles for graphic design courses in higher vocational colleges

2.1. Student-centered principle

Students are the users of micro-lessons, and their learning effect directly reflects the production level and use value of micro-lessons. Therefore, graphic design teachers in vocational colleges should always adhere to the student-centered principle in the process of making micro lessons^[1]. On the one hand, they should collect materials for micro lessons according to the recent teaching content and students' graphic design basis, and try to select some works that meet the aesthetics of post-00 college students, such as national style print advertising, cultural and creative supplies and packaging design to stimulate their interest in learning. On the other hand, teachers should use concise language and clear mind maps and other materials in the design of micro-lessons to catch students' eyes and deepen their memory of graphic design knowledge points^[2].

2.2. The principle of docking positions

Vocational graphic design teachers should adhere to the employment-oriented approach, integrate excellent graphic advertisements, posters, illustrations, UI design, packaging design and other works of enterprises into the micro-class, further promote the connection between job skills and graphic design teaching, and integrate professional quality education into the micro-class teaching, so that students can understand the new technology and new concept of the graphic design industry in advance to further enhance their post competency. At the same time, teachers can jointly record micro-lessons focusing on the skills of graphic designers, demonstrate the operation process of various graphic design software in detail, and integrate typical

work cases into micro-lessons. Real working situations can stimulate students' enthusiasm for independent learning and further improve their professional ability^[3].

2.3. The principle of combining technology and artistry

The micro-course design of higher vocational graphic design courses should follow the principle of micro-course of higher vocational graphic design courses. Technical means that teachers should have solid short video production ability and professional knowledge of graphic design, making exquisite micro-lessons according to the teaching content, integrating high-quality graphic design education resources, enriching the content of micro-lessons, and meeting the personalized learning needs of students. This can avoid misleading students by micro-class. Artistry refers to the fact that teachers should pay attention to vividness and interest in the production of micro-lessons, the pictures should be simple, beautiful, and generous, can stimulate students' emotional resonance, optimize the design of color, filter, composition, and layout, etc., bring students a strong visual impact and visual enjoyment, to deepen students' memory of the content of micro-lessons and further improve their graphic design ability.

2.4. The principle of integration of science and practice

Graphic design is both theoretical and practical. In micro-course design, teachers should base on this specialty feature, adhere to the principle of integration of science and practice, break the boundaries between courses and teaching materials inside and outside class, re-integrate course resources, integrate theory with practice courses, and enable students to master marketing, color science, hand-painting and design software operation skills in practice to further enhance their practical ability. At the same time, teachers should integrate enterprise cases into micro-class design, analyze the characteristics of excellent advertising, UI design and packaging design, and use graphic design software to restore the design steps, integrate theory and practical knowledge, help students understand complex and abstract graphic design knowledge, to improve their graphic design ability^[4].

3. Analysis of the current situation of graphic design teaching in higher vocational colleges in the new era

3.1. The connection between theory and practice courses is not close

Graphic design major not only requires students to master marketing, art design and other theoretical knowledge, but also requires them to master all kinds of design software operation skills, the practical skills of students are relatively high requirements, but at present, the teaching theory and practice of graphic design major in higher vocational colleges are derailed, affecting the teaching quality of professional courses^[5]. In graphic design teaching, teachers habitually explain theoretical knowledge first and then arrange practical training for students, ignoring the construction of an integrated teaching mode of theory and practice. Theory and practice teaching are derailed, which is not conducive to the cultivation of students' practical ability and affects the teaching quality of graphic design.

3.2. The level of information teaching needs to be improved

With the rapid development of Internet technology, new technologies such as micro-class, blended teaching and big data have become a hot topic in the reform of information-based teaching in higher vocational colleges. However, graphic design teachers have uneven ability in information-based teaching, which affects the teaching quality of graphic design. Some teachers are used to using PPT to explain professional knowledge such as packaging design, poster design and web design, or downloading teaching micro-lessons on the Internet, ignoring the independent production of micro-lessons and carrying out online and offline mixed teaching. The connection between online and offline teaching is not smooth. Some teachers neglect to use micro-lessons to explain the operation process of graphic design software^[6]. Due to the different functions and operation steps of each software, it is difficult for simple demonstration teaching to explain the software functions in depth, and it is difficult to guide students to practice the operation of graphic software after class.

3.3. Single teaching mode of graphic design software

Graphic design teaching in higher vocational colleges cannot be separated from various kinds of software, such as Photoshop, Adobe Illustrator and AutoCAD, and software operation is an important part of the practical teaching of graphic design. However, the current teaching method of graphic design software is simple and unattractive, and it is difficult to stimulate students' interest in learning^[7]. Teachers are more accustomed to demonstrating the operation process of various graphic design software, explaining it to students while operating it, and then assigning software operation assignments. They take the software design works submitted by students as the teaching evaluation criteria, ignoring the use of graphic design software to restore excellent posters, product packaging and other design works, and integrating them into an excellent case of enterprises. This is not conducive to cultivating students' ability to operate graphic design software.

3.4. The effect of school-enterprise cooperation in educating students is not good

The integration of production and education and the cooperation between schools and enterprises in vocational graphic design are not effective, which is mainly reflected in the following aspects:

(1) The school neglects to hire corporate graphic designers and artists to participate in campus teaching, which affects the connection between graphic design post skills and professional course teaching.

(2) Enterprises do not participate in the development of graphic design courses, personnel training and teaching evaluation, which leads to some teaching content lagging behind the needs of graphic design talents of enterprises, resulting in students' difficulty in meeting the needs of talents of enterprises and affecting students' employment^[8].

4. The application strategy of micro-courses in the teaching of graphic design in higher vocational colleges

4.1. Elaborately make teaching micro-lessons and broaden the application channels of micro-

lessons

Vocational graphic design teachers should change their teaching concepts, actively learn the skills of making micro-lessons, and use micro-lessons to link up the three major links before, during and after class to form a closed loop of teaching, which can not only guide students to study independently but also understand students' learning progress in time to improve the quality of teaching ^[9]. First of all, teachers should make pre-class micro-lessons according to the teaching content, extract the key and difficult knowledge points in the textbook, and make micro-lessons according to the key and difficult knowledge points. They should combine text, mind maps and pictures to dynamically explain the knowledge of web design, UI design, packaging design, and poster design, flexibly adjust the content of micro-lessons, and assign pre-class homework in micro-lessons. Guide the students to preview before class. Students can collect relevant materials according to the knowledge points of the pre-class textbook, according to the pre-class homework, and use the Internet to search relevant materials to further improve the efficiency of the pre-class.

Secondly, teachers can elaborate micro-lessons for classroom teaching, introduce excellent design works, explain graphic design knowledge combined with the works, guide students to explore according to the content of micro-lessons, and further stimulate their enthusiasm for independent learning. Students can discuss micro-lesson cases, analyze case design concepts, design software used, design highlights, etc., and further master graphic design skills. In addition, teachers can also make micro-lessons for review, record micro-lessons for important and difficult points and graphic design cases, and explain the design steps, so that students can review independently after class according to micro-lessons, and further improve their learning ability of professional courses ^[10].

4.2. Micro-lessons create interesting situations to stimulate students' interest in learning

Graphic design teachers in vocational colleges can use micro-lessons to introduce new lessons, create diversified and immersive teaching situations, further stimulate students' interest in exploring graphic design knowledge

and guide them to explore it ^[11]. For example, in poster design teaching, teachers can collect popular movie posters and Wuhe Kirin posters, and make these posters into micro-lessons to create a teaching atmosphere with a more visual impact effect, to stimulate students' enthusiasm for independent learning. Micro-class can be integrated into the "Wandering Earth 2," "Chang'an Thirty Thousand Miles" movie posters, as well as the "National Memorial," "The Memory of Yuan Longping" and "Return Boat" posters created by Wuhe Qilin, guide students to analyze these poster design highlights, encourage them to appreciate excellent works, and further improve their aesthetic ability and innovation ability. Some students think that "Wandering Earth" is a representative of Chinese science fiction movies, the movie poster to "human choice" as the theme, the sunset under the fighter jets, artillery shells flying, and the main actors looking into the distance. Some students analyzed the National Memorial created by the illustrator Wu He Kirin. The overall color is black and gray. The background of the picture is heavy black clouds and smoke of gunpowder. A monument in the shape of a cross stands straight in the center of the picture. Condolence for the victims of the Nanjing Massacre and a call for people not to forget history and for us to strengthen ourselves. Micro classes can create interesting teaching situations, guide students to explore on their own and deepen their understanding of graphic design expertise ^[12].

4.3. Micro-lessons explain the software operation steps to improve students' practical ability

Vocational graphic design teachers should integrate micro-lessons into the teaching of various design software, record different design software operation tutorials, dynamically explain software steps, and add text descriptions to help students understand software functions and operation steps as soon as possible to improve their graphic design software operation ability ^[13]. For example, when teachers explain the operation of Photoshop software, they can record micro-lessons, explain in detail the retouching skills such as layer superposition and filter, and comprehensively explain the functions and operation processes of the software, so

that students can master the retouching skills as soon as possible and lay a good foundation for graphic design.

First, the micro-lesson can explain the Photoshop menu bar, toolbar, option bar, panel and canvas area, demonstrating the layer editing process, in the layer panel of Photoshop, click the “New layer” button to create a new layer. You can make edits on the new layer, such as drawing, smudging, adding text, etc. You can also change the effect of the layer by adjusting its opacity, blending mode, fill mode and other properties.

Second, teachers can send the tutorial video to students, so that they can practice Photoshop software operation according to micro-lessons after class, master the skills of layer editing, text editing, filter use, image color adjustment and curve adjustment, etc., which lays a good foundation for the subsequent teaching of poster design, illustration design and packaging design. Micro-lessons can help students master the operation skills of graphic design software so that they can review and practice the software operation independently after class to improve their practical operation ability and graphic design ability^[14].

4.4. Integrate design cases into micro-classes to carry out integrated teaching of science and practice

First of all, graphic design teachers in higher vocational colleges should actively collect enterprise design cases and integrate these cases into their teaching with micro-lessons to promote the connection between graphic design post skills and professional teaching, promote the connection between theory and practice teaching, and accelerate the construction of an integrated teaching mode of graphic design major^[15]. For example, teachers can collect cases of enterprise web design, UI design, cultural and creative design and illustration design, and integrate these works into micro-lessons, and use micro-lessons to display these excellent works, clarify the employment direction of graphic design majors, and further stimulate students' enthusiasm for independent learning.

Secondly, teachers can use enterprise cases to carry out project-based teaching, encourage students to form groups freely, let them restore enterprise design cases, and cultivate their craftsman spirit. Each group

can select an excellent case of an enterprise, analyze the design concept and design materials of the case within the group, formulate a project-based learning plan, clarify the division of labor of each group member, and work together to complete the graphic design figure. For example, some groups analyzed the design drawings of cultural and creative products of the Forbidden City, tried to draw folding fans and bookmarks with patterns of Kangxi and Qianlong, drawing with Photoshop software, and designed Q-version of emojis, and submitted the works of the group. Teachers can organize the display of project results, encourage each group to elaborate on design concepts and share design drawings, guide each group to evaluate each other, enliven the classroom atmosphere, and further improve students' innovation ability and graphic design abilities.

4.5. Promote the strategy of integrating production and teaching, and establish a micro-class teaching resource bank

Higher vocational colleges should comprehensively promote the integration of production and education, school-enterprise cooperation, and invite enterprises to participate in the construction of micro-class teaching resources. On the one hand, they can collect enterprise graphic design cases and make micro-class works of graphic design cases to enrich teaching content. On the other hand, they can go deep into the enterprise to shoot practical teaching videos, and the enterprise graphic designer, illustrator, and artist will serve as the “protagonist” of the micro-course, integrating different graphic design post skills into the teaching, and the school and enterprise can jointly build the micro-course teaching resource library to provide high-quality micro-lessons for teachers and students. For example, graphic design teachers can actively cooperate with enterprise graphic designers, collect their excellent design works, and make their design works into micro-lessons, and use them as teaching cases to provide high-quality teaching materials for subsequent project-based teaching and case teaching. In addition, teachers can go deep into the enterprise to shoot practical teaching videos, shoot graphic designers, artists and illustrators work videos, explaining the graphic design software operation process through the lens, let them share the software's quick

operation skills for students, and further improve the quality of practical teaching. The micro-class teaching resource library jointly built by schools and enterprises can facilitate enterprises to integrate job skills into the graphic design teaching of higher vocational colleges, meet their talent needs, thus stimulating their enthusiasm to participate in school-enterprise cooperation, facilitating students to understand the employment direction in advance and master job skills to improve their employment competitiveness.

5. Conclusion

In short, graphic design teachers in higher vocational colleges should make rational use of micro-lessons, independently make micro-lessons, use them to link

up the teaching before, during and after class, guide students to study independently scientifically, integrate high-quality Internet design cases into micro-lessons, let students learn about new concepts and technologies in the field of graphic design on time, and improve their innovation and design ability. At the same time, teachers can use micro-lessons to explain the operation of graphic design software, record all kinds of software tutorial videos, and share the videos with students, so that students can refer to the videos for practice, use micro-lessons to explain excellent design cases of enterprises, promote the connection between graphic design post skills and professional courses teaching, and comprehensively improve the teaching quality of graphic design in vocational colleges.

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Exploration of Soft Motion Control Platform for Real-time Linux System and Ethernet Fieldbus

Haixia Wang, Xumei Wang

Wuhan Huaxia Institute of Technology, Wuhan Hubei 430223, China

**Corresponding author:* Haixia Wang, hxzp@whhxit.edu.cn

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Abstract:

At present, the world's major economic powers have introduced the development strategy of "revitalizing the manufacturing industry," which has promoted a new wave of industrial and technological revolution. China has also introduced the "Made in China 2025" plan to promote the development of high-end manufacturing. As a core part of industrial production, high-quality control systems play a very important role in improving the level of industrial production in China. To adapt to the increasingly complex processing requirements, the operation requirements of the robot are getting higher, requiring it to have a strong openness and easy operability and be able to integrate various types of sensors. At present, the action controller produced by many manufacturers in China lack openness, low-cost performance, not easily integrate all kinds of sensors and other problems, and many core technologies rely on foreign manufacturers lack a certain independent research and development ability, which greatly restricts the development of China's industrial manufacturing industry. Because of the above problems, this paper proposes a soft motion control platform based on a real-time Linux system, designs a soft motion control platform, and gives a solution for building a motion control system, hoping to be a certain reference ^[1].

Keywords:

Real-time Linux system
Ethernet fieldbus
Soft motion control platform
Exploration

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1. Research background analysis

The traditional motion controller is mostly realized by way of a hardware board, the openness and expansibility are poor, and cannot adapt to the current requirements. In order to improve the performance of the controller, network technology has been introduced into the motion

control system in recent years, and Ethernet technology has also developed. With the continuous progress of computer technology and real-time operating system technology, the motion control system with an Ethernet bus as the core of PC has become a general trend ^[2]. Different from the traditional control mode, this project

is based on a PC and real-time system, the important functions of the controller are realized in the way of software, which has the characteristics of high openness, flexible topology, high communication rate, and low cost. In recent years, domestic motion control technology has been greatly developed, but high-end motion control is still relatively backward. Domestic manufacturing enterprises mainly rely on foreign commercial solutions in the key links and have not fully mastered the core technology. Therefore, this paper proposes a flexible motion control platform based on an embedded real-time operating system and Ethernet fieldbus technology, which has high openness and cost performance [3].

2. Functional requirement analysis of soft motion control platform

2.1. Support real-time Ethernet fieldbus

The system takes motion control as the basic function, and its core is to control each device such as servo motor, IO, etc., to achieve the pre-set goals. On this basis, a new control mode is proposed, that is, a new type of bus with high reliability is adopted. There are many types of real-time Ethernet buses, such as Ethernet, Profinet, etc. Power Link, Ethical VIP, etc. [4] Among these buses, Ethernet bus is famous for its high communication speed, high data utilization efficiency and good synchronization performance. Because of its flexible topology and other characteristics, it has become the first choice of many automation manufacturers at home and abroad. To enhance the openness and flexibility of the system, it is necessary to monitor the whole system in real-time, especially the EtherCAT bus.

2.2. Provide motion control library and support algorithm expansion

To ensure the stable operation of the robot, it is necessary to design a complete set of multiple complete robot systems. PLCopen action control technology has been widely used in the world, so it is necessary to design a matching action control for it to reduce the operating difficulties of developers, which has a certain guiding effect on the use of crane control systems. In addition, the flexible action control system has a higher degree of openness, so it is necessary to design a basic control

interface for it so that users can design the corresponding action control strategy according to the actual situation, and carry out the corresponding algorithm expansion [5].

2.3. Support all kinds of sensors

In the modern manufacturing industry, due to the continuous improvement of processing technology and technological level, making its processing technology increasingly complex, not only the motion control ability of the system and the intelligence of the system also put forward higher requirements. To adapt to the increasingly complex control requirements, industrial cameras are usually used in the control system, and more control is completed with the aid of computer vision. In addition, other types of sensing devices have also been widely used in actual production. Therefore, support for industrial cameras and various types of sensors is also a key feature of a high-end motion control platform [6].

2.4. Easy networking

At present, the world is setting off a new scientific, technological and industrial revolution, accelerating the upgrading of manufacturing, Germany took the lead in launching the "Industry 4.0," and many countries around the world have also launched their manufacturing development strategies. The country has formulated the "Made in China 2025" plan to promote the interconnection of industrial equipment and information sharing through the Internet and improve the wisdom of manufacturing. In multiple factories, the mobile control platform, as the main carrier to collect various industrial site information, has put forward higher requirements for its operation mode. Therefore, the action controller that realizes network connection has also become a key technology of modern control systems [7].

2.5. Good man-machine interface

In order to enable the user to carry out the initial debugging of the controlled device, the system parameters and related parameters are set, so there must be a good man-machine interface. In addition, most automatic systems are equipped with a man-machine interface for the user to operate [8]. This requires the system to have a better human-machine interface but also requires it to be convenient for man-machine interaction.

3. The construction of a real-time Linux system

A real-time operating system (RTOS) is an operating environment that can perform a certain job in a certain amount of time. It is divided into “hard execution” and “soft execution” two parts, in which “hard execution” refers to within a certain time limit, to complete a specific task, otherwise, it will produce unforeseeable results^[9]. In addition, finish the work as early as possible, where if you exceed the prescribed time limit, there will be no danger to your life. In the current situation, it is usually used to extend the general operating system in real-time, and the Windows, Linux and other operating systems in real-time extension is a more common method. Compared with Windows, Linux has the advantages of high stability, free open filtering, etc. The paper chooses the parallel extension technology on the Linux platform and builds the Xenomai real-time operating system.

3.1. The factors that affect the real-time performance of Linux system

The concept of universal operating system design is to shorten the average response time of the whole system as far as possible, improve the total number of tasks handled by the system per unit time, pay attention to the overall functional requirements of the system, and achieve better average performance. However, these design concepts run counter to the requirements of a real-time operating system. The factors that affect the real-time performance of Linux systems are mainly as follows:

(1) The scheduling method of process

There are two scheduling methods based on priority and fairness in Linux. The scheduling by priority mechanism allows processes to be arranged according to priority, while the process preemption policy only applies to a process in the user state, and a process in the core state does not guarantee that it will be occupied, so the phenomenon of priority reversal occurs. It does not meet the requirement of real-time. A fair allocation strategy, which ensures that each processing can reasonably use hardware resources such as CPU, makes high real-time processing, which has a great limit on running speed, cannot be prioritized.

(2) Core preemption

Linux’s default core preemption means that a

process cannot be occupied by high-priority processing while the CPU is occupied, which violates the need for real-time. Linux 2.6, although also has priority, but in the critical area or cannot be preempted, in principle, such a mechanism can only achieve “soft real-time”^[10].

(3) Intermittent mask

Linux’s default interrupt is the largest, and when it executes half of an interrupt, it will shut down the interrupt, so that higher interrupts cannot be answered, resulting in increased system failure delays and scheduled delays.

(4) Rough clock granularity

Clock granularity refers to the minimum time interval that the system can achieve, and is the minimum cycle of task scheduling in the operating system. The larger the clock granularity, the slower the response, the higher the network cost, and the lower the network transmission rate. Linux has a minimum clock accuracy of 0. In the actual production process, the requirement of 8 ms is a millisecond level, which cannot meet the real-time requirement.

(5) Virtual memory technology

The operating system generally adopts the way of virtual memory to manage memory and generally adopts the way of paging fragments. If the CPU wants to get the data that is not in the cache, then it will swap the memory pages, which will increase the work delay, so that it cannot complete the task in the specified time.

3.2. Linux system real-time transformation scheme

To solve the problem of poor real-time performance of Linux systems, there are two existing real-time improvement methods:

(1) Internal reconstruction

In this scheme in the case of no great changes, the Linux core source code is directly changed, so as to achieve a complete CPU can be occupied^[11]. However, such a control strategy can only ensure that all kinds of unpredictable effects exist in the actual process without affecting the actual process, so the control strategy proposed in this project has the characteristics of “soft real-time.”

(2) Method of dual kernel

That is to build a real-time kernel in parallel with

the Linux core. The kernel is responsible for all the real-time execution, which ensures the real-time of the system. In the middle of the two operating systems, a just-in-time kernel was built to replace Linux and check-kernel. Using the dual-core method, it can achieve both high real-time and strong real-time, and ensure the stable operation of the Linux system itself. After comparing and comparing the above two ways of implementation, we put forward a solution using a dual-core way, using Xenomai real-time processing technology^[12].

3.3. Xenomai real-time system construction

Xenomai adopts ADEOS (OS Adaptive Domain Environment) to complete the processing and control of hardware-level interruptions. ADEOS adopts the idea of “domain” to realize the control of multiple OS cores, multiple OS cores run in the fields supported by ADEOS, and ensure the priority of work in each field by setting the priority of each field.

Xenomai in the development process uses ADEOS programming language so that it can adapt to a variety of different real-time operating systems^[13]. Each of the functional modules in Xenomai is called Xenomai “skin,” which supports the interface with real-time applications such as vxworks so that software compatibility can be achieved at the source code level, and improve the portability of software. Xenomai company’s RTL (Real-Driver Programming Model) provides an embedded system based on Linux kernel for the core software.

When developing Xenomai, a core with an instant patch must first compiled, the Linux core code used here is 3.18.20, and Linux Xenomai is 2.6.5, and Ubuntu 4.04.6 is its operating system. First of all, to download the Linux core code and Xenomai source code, there are some instant patches, because the workload of this program is relatively large, so to run in an efficient development machine, the specific workflow is like this:

(1) The development machine installs an assembly link and a dependency library with the machine that is running. In Ubuntu 4.04.6, gcc-4.8 is used to edit the compilation link of the linux kernel, which is done on a developer’s terminal.

(2) The core settings in operation were set up, and it was immediately patched. Before start writing Linux code, the functions of your system have to be set up first,

and then you have to run a compiled core on a running machine, so the settings are the same as the running machine, the purpose of this is to copy the conflg file in the running/root directory into the Linux source code to be edited, and then name it conflg. Next, enter the source code for Linux on the command line, and then patch the Linux source code with this script.

(3) Instant settings on the core were performed. Features that negatively affect real-time performance were turned off, such as power-saving management of the Linux core processor, and setting maximum stack memory for real-time systems. Once the configuration is complete, compiling started.

(4) Install the core image on the running machine and install the Xenomai user-space library. On the running machine, the source code of Xenomai-2.6.5 was downloaded, compiled and installed.

The delay time in Xenomai software was detected and its performance was analyzed. The machine adopts an Intel J1900 series chip to play back the high-definition image to improve the system load, and delays the positive and negative delay in the test after 6 hours. The system has a high delay time, and can well meet the requirements of a flexible action control system in real time.

4. Soft motion control platform software architecture

Based on the established embedded real-time operating system, a set of flexible motion controllers is built using two Ethernet buses as drivers^[14]. Its ultimate form consists of two aspects: one is the management tool of the platform, and the other is a functional component. Each module of the system is composed of two levels: the lower communication thread and the user interface library.

On this basis, a new bus network model based on the network is proposed. The corresponding information is generated in the system. The software provides some settings for the host and slave stations, such as the host and slave stations, which can set parameters and produce a synopsis for recording parameters. When the user is designing the application program, the user can get the relevant information through the interface provided by

the platform to achieve the purpose of simplifying the program development. In addition, the software also realizes the monitoring of the software in the process of performance indicators, convenient for users to analyze.

The functional component of the platform is a software ontology of the control platform, which includes its communication thread library and a user interface library for users to use, and the EtherCAT and EtherMAC bus call protocol stack to realize the real-time thread of data exchange between the slave station as the basis. Threads assign individual data to thread II's process variable resources. In a Linux environment, users can use this interface to create their applications. The user interface library mainly includes the control interface, management interface, action control interface and so on. The function of the interface management module of the system is: start stop, stop, stop and so on. The motion control interface realizes the control of the servo system and 10 devices. The number of its adjustment will eventually affect the variable resources allocated by the lower flow plan to the slave program, and then realize the control of the slave program.

The system is designed into two levels, namely the real-time level and the non-real-time level. In the real-time level, it is mainly for some algorithms that require real-time processing. First of all, through the operation of the system, it can realize the operation of the system according to its operating ability. At the same time, the system also provides a lower axis control interface and PDO interface, which can allow users to expand different algorithms according to different applications^[15].

5. Conclusion

To sum up, the motion controller is the “brain” of industrial equipment and one of the most important components in the manufacturing field. The development of advanced motion controllers is the key to improving the level of manufacturing. Nowadays, the manufacturing of all kinds of products is more complex, and the motion controller must constantly meet the current advanced manufacturing process to meet the ever-changing manufacturing needs of the advanced manufacturing industry.

Disclosure statement

The authors declare no conflict of interest.

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Analysis of Talent Cultivation Strategies in Colleges and Universities Based on Rural Revitalization

Yu Bai, Jinlian Liu

City College of Huizhou, Huizhou Guangdong 516000

**Corresponding author:* Yu Bai, sxwlzd@163.com

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Abstract:

In recent years, the rural revitalization strategy has become an important task for China's economic and social development, and it is imperative to carry out grassroots personnel training around higher education. To promote the process of rural revitalization and train an excellent team of rural talents, the corresponding theoretical research is needed to guide practice. As the cradle of talent training, colleges and universities play a key role in rural revitalization, and the innovation of talent training mode has attracted much attention. This paper analyzes the background of the rural revitalization strategy, discusses the necessity of college talent training, and puts forward some innovative strategies to provide a valuable reference for the implementation of rural revitalization.

Keywords:

Rural revitalization
Colleges and universities
Personnel training
Necessity
Strategy

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1. Introduction

Starting from the proposal and background analysis of rural revitalization strategy, this paper discusses the necessity of college talent training in rural revitalization. From the three aspects of rural party organization construction, rural economic construction and rural culture construction, this paper reveals the needs of rural revitalization for young college students. Then, it puts forward a series of innovative strategies, including strengthening the interaction between the government and colleges, clarifying the orientation of grassroots talent training, cultivating the values and employment views of college students serving the grassroots, and

enhancing the grassroots party-building ability and vocational ability of young college students. The specific implementation provides more powerful intellectual support and talent guarantee for rural revitalization ^[1]. The realization of rural revitalization cannot be separated from the cultivation and transportation of talents in colleges and universities. It is also hoped that this study can help the cause of rural revitalization to a higher level.

2. The proposal and background analysis of rural revitalization strategy

The 19th National Congress of the Communist Party

of China decided to deploy the rural revitalization strategy and made clear the general requirements for implementing the strategy, namely, thriving industries, livable ecology, civilized village style, effective governance, and a prosperous life. The recently released Strategic Plan for Rural Revitalization (2018–2022) further mapped out the implementation of the strategy and identified key tasks for each stage. The rural revitalization strategy is a major task for winning a decisive victory in completing the building of a moderately prosperous society in all respects and building a modern socialist country in an all-round way. It is also the main focus of the work concerning agriculture, rural areas and farmers in the new era ^[2]. This strategy is of great significance for realizing rural economic and social modernization and promoting China's efforts to build a modern socialist country in a comprehensive way.

At present, the rural population is generally faced with the problems of young people going out to work, the low proportion of young cadres in rural areas and the low level of education, resulting in the shortage of service and management talents in rural areas ^[3]. In addition, the number of college graduates is constantly increasing, and the competition for jobs is fierce. To cope with the situation, party and government departments at all levels have introduced policies and measures to encourage college students to exercise at the grassroots level. College students' participation in rural revitalization can not only ease employment pressure but also meet the demand for talent in the rural revitalization strategy. It helps solve the problem of talent shortage in rural areas, and can also provide opportunities for college graduates' personal growth and career development, achieving a win-win situation.

For colleges and universities, exploring a new way to cultivate innovative and applied talents from the perspective of rural revitalization will also improve the higher education model and further build a new system of talent training that is targeted, has professional characteristics, and can connect with grassroots cause and vocational ability training ^[4]. In other words, a series of methods and means adopted by colleges and universities to match the strategy of rural revitalization will also promote the modernization and comprehensive

development of their schools, and promote the sustainable development of higher education. In the future, colleges and universities should also adjust the structure and mode of talent training around the rural revitalization strategy, help college students explore and practice grass-roots services, and provide them with more opportunities to participate in the cause of rural revitalization.

3. The necessity of college talent training based on rural revitalization

3.1. The construction of rural organizations needs young college students

At present, there are some problems in the construction of rural party organizations, such as the low cultural quality of party members, aging, insufficient organizational reserve force, and more mobile party members. These problems affect the effectiveness of party building, but also restrict the development of rural revitalization, in this context, young college students play an important role ^[5]. With high ideological and political consciousness and ideological concepts, young college students can timely understand and communicate national policies, and play a demonstration and leading role for grassroots farmers. They are active in thinking and have a strong ability to understand the Party's lines, principles and policies. They can convey correct ideological guidance in rural party organizations and improve the political quality of party members. They receive systematic professional knowledge and ideological education in college, have a broad knowledge vision and theoretical literacy, and can flexibly use what they have learned to provide innovative ideas and problem-solving methods for rural Party organizations and promote the innovative development of party-building work. In addition, young college students have better communication and exchange skills, usually have better language skills and interpersonal skills, can effectively communicate with the grassroots, understand the actual needs of farmers, and promote the effective connection between party-building work and rural development ^[6]. In other words, young students can bring new sources of vitality to rural party building, improve the organizational ability and service level of rural party organizations, and help the

overall advancement of rural revitalization.

3.2. Rural economic construction needs young college students

At present, in China's rural areas, the level of economic development is relatively lagging, and there are problems of unbalanced and inadequate development. The basic principle of the rural revitalization strategy calls for giving priority to agricultural and rural development and realizing agricultural modernization and comprehensive development of the rural economy. To this end, it must also inject new production concepts, methods and technical means, and college students play a key role in the implementation of the corresponding programs. With solid professional knowledge background, young college students can provide professional guidance for the development of the rural economy. They have received systematic professional training in higher education and have acquired certain knowledge and skills in economics, management and agricultural science^[7]. In rural economic construction, young college students can use their professional knowledge to provide professional guidance and technical support for local agricultural production, processing of agricultural products, popularization of agricultural science and technology and other fields, so as to promote the modernization process of rural economy. At the same time, innovation and entrepreneurship education also have an impact on college students' thinking, ability and quality. Young college students' participation in rural revitalization and serving grassroots undertakings means that new thinking models and business models can be implemented, and under the guidance of the spirit of innovation, they can go more stable and long-term, realize the diversified development of rural industries, and promote the rural economy to get rid of poverty and get rich. To sum up, the rural economic construction needs the participation of young college students. Colleges and universities should cultivate outstanding students with professional ability, innovation consciousness and vocational ability, guide them to invest in the cause of rural revitalization, and build beautiful countryside^[8].

4. Innovation of college talent training strategy based on rural revitalization

4.1. Strengthen the interaction between the government and universities

At the government level, more job options and preferential policies should be provided, and more development incentive policies, material incentive policies, and honor incentive policies should be provided for university party members. In addition, it should appropriately raise the subsidy standard and social security intensity for serving grassroots, and provide more preferential policies for career development for college students serving grassroots. This can increase the motivation of college students to participate in rural revitalization and make them more willing to devote themselves to grassroots work^[9]. At the university level, to strengthen the interaction between the government and universities, the relevant needs of college students and the employment situation of grass-roots services should be timely reported to the government. Colleges and universities should also pass on the relevant policies and measures of the government to students, help them understand the specific content of the policies, and stimulate their enthusiasm to serve the grassroots. This will help improve the incentive effect of the policies and make more college students willing to participate in the practice of rural revitalization. On this basis, policy publicity is inevitable, and the interpretation of new policies and documents must be fully and effectively so that more students can understand the corresponding specific content and goals. It is also necessary for the government to establish a feedback mechanism to timely understand the employment situation of graduates at the grass-roots level every year, understand the true thoughts of college students on grass-roots services, and timely feedback the relevant information to colleges and universities. Colleges and universities can optimize and improve the talent training strategy and mobilize more students to actively participate in the construction of rural areas, which will achieve twice the result with half the effort. Building a close relationship between the government and colleges and universities can also promote education development and innovation, and truly implement rural revitalization from the source. To sum up, strengthening the interaction between the

government and universities is of great significance to the implementation of the rural revitalization strategy. Only by forming a close cooperative relationship between the government and colleges and universities and jointly formulating and implementing relevant policies and measures can better conditions be provided for college students to participate in rural revitalization, enhance their willingness to participate, and promote the smooth implementation of the rural revitalization strategy^[10].

4.2. Define the orientation of grassroots talent training

Colleges and universities should be guided by the needs of the national rural revitalization strategy and change their role positioning, not only guiding college students to serve the grassroots but also training talents for rural revitalization. First of all, colleges and universities need to clarify the talent needs for rural revitalization in their enrollment plans and formulate corresponding talent training plans according to these needs. The recruitment should strengthen the absorption of rural students from the source, especially for students with rural backgrounds and career aspirations, and provide more preferential policies and incentive policies to encourage them to choose professional courses related to rural revitalization.

Secondly, colleges and universities should focus on building a rural-oriented talent training model. This requires universities to adjust their majors and curriculum offerings and offer more professional and practical courses related to rural revitalization. At the same time, cooperation with rural-related enterprises should be strengthened to provide more opportunities for students to practice innovation and entrepreneurship, cultivate their ability to cope with rural problems in practice and improve their social adaptability and innovation ability^[11]. In addition, in the ideological and political education work in colleges and universities, the ideal and belief education of college students in the new era should be strengthened. By strengthening the publicity and explanation of the rural revitalization strategy, students should realize the importance of rural revitalization to the country and the people, and then transform the attraction of grass-roots policies into the intrinsic needs of students. To sum up, it is an important aspect of the implementation of the rural revitalization

strategy to clarify the orientation of grassroots talent training. Colleges and universities should take the rural revitalization strategy as the guide, make innovations in enrollment plans, personnel training plans, majors and curriculum settings, and cultivate talents suitable for rural areas. At the same time, they should strengthen ideological and political education to provide intellectual support and talent guarantee for rural revitalization.

4.3. Cultivate college students' values of serving the grassroots

Based on the cultivation of values of serving the grassroots of young college students, it must be rooted in the ideal goals and career planning of college students, leading them to devote themselves to the cause of patriotism and national construction, realizing the great Chinese dream, connecting personal dreams with the development of the country, and fully realizing students' values. First of all, college education should pay attention to the education of socialist core values. Through classroom teaching and ideological and political education activities, students should have a deep understanding of the importance of rural revitalization strategy to national prosperity and rejuvenation. At the same time, it is necessary to strengthen the cultivation of students' sense of citizenship and social responsibility, so that they realize that grassroots posts are an important platform to show their talents and serve the country, and stimulate their enthusiasm to contribute to the grassroots and the country.

Secondly, colleges and universities should pay attention to cultivating students' practical ability in teaching. Through practical teaching and social practice activities, students can feel the importance and significance of grassroots work and enhance their sense of identity for grassroots services^[12]. At the same time, students are guided to take the initiative to participate in social practice projects, so that they can understand the actual situation of grassroots work and cultivate the practical ability of serving grassroots. In particular, through the research of agricultural assistance projects and practical activities, students are inspired to innovate and start businesses, innovate and practice, truly create a happy life with their own hands, and build a beautiful and charming countryside. When conditions permit,

students are actively provided with more internship and employment opportunities related to the grassroots. It is important to have strengthened cooperation with relevant departments such as the government, enterprises and public institutions to provide students with practical opportunities to participate in rural revitalization. At the same time, good contacts and communication channels will be established with grassroots institutions to understand the needs of grassroots talents and provide students with employment guidance and support for employment and entrepreneurship to help them better serve the grassroots. To sum up, it is very necessary to cultivate the values of serving the grassroots of college students, which is an important cornerstone for setting up the lofty ideals of young college students to further revitalize rural industry, economy and culture. Colleges and universities should take the core socialist values as the benchmark, guide students to establish the correct values of serving the grassroots through various ways such as education, practice and providing opportunities, stimulate their enthusiasm and sense of responsibility, and contribute to the cause of rural revitalization^[13].

4.4. Strengthen young college students' capacity for community-level party building

Strengthen the grassroots party-building ability of young college students, promote the core competitiveness of college students, and lay a solid foundation for the grassroots service cause. To this end, colleges and universities should take a series of actions, and make full use of available resources, conditions, etc., to train college students in rural party building work ability level. Through Party course education and theoretical study, college students should improve their understanding of the basic knowledge of the Party, the Party's guiding ideology and the rural revitalization strategy. Guide college party members to deeply understand the importance and characteristics of rural party building work, and enhance their sense of responsibility and mission in participating in rural party building^[14]. When conditions are available, the network party member education resources should be actively utilized to enhance the party spirit of college party members. Online platforms should be used to carry out online Party classes, online discussions and other activities,

strengthen ideological guidance and political education for college party members, and help them establish a correct sense of party membership and party spirit. To sum up, to enhance the grassroots party-building ability of young college students, colleges and universities should enhance the theoretical basis of party-building and workability of college students by strengthening training and education, using network party member education resources and other ways, and cultivating their core competitiveness in rural party building work^[15].

4.5. Enhance the grass-roots vocational ability of young college students

To promote rural revitalization as soon as possible, colleges and universities should take a series of measures to help students improve their work serviceability, prepare for careers, and provide talents with practical abilities for rural revitalization. First of all, starting from the curriculum, add some adaptive electives to train and exercise students' grassroots work skills. In addition to learning professional knowledge, students should also choose courses related to grassroots work and learn the ability to lead rural areas to become rich. Through the training of organizations and cadres, students' ability in organization and management, language expression, and emergency handling can be improved, to provide methods and means for solving rural conflicts. In addition, colleges and universities should also promote social practice and practical courses to cultivate students' practical ability and promote the accumulation of relevant work experience. Through organizing practical activities such as grassroots research, volunteer teaching and science popularization, students can accumulate experience in grassroots work practice, understand the actual situation in rural areas, and cultivate a strong will and ideological preparation to adapt to rural grassroots work. To sum up, colleges and universities should re-plan the curriculum, provide practical opportunities and training opportunities, cultivate students' grassroots work skills, and provide outstanding talents with practical experience for rural revitalization.

5. Conclusion

In short, rural revitalization is an important direction

of China's future development, and college talent training is a key factor in the implementation of the rural revitalization strategy. By strengthening the interaction between the government and colleges, making clear the orientation of grassroots personnel training, cultivating the values and employment outlook of college students serving the grassroots, and enhancing the grassroots party-building ability and vocational ability of young

college students, more intellectual support and talent guarantee can be provided for rural revitalization. It is believed that with the joint efforts of colleges and universities and the government, the rural revitalization strategy will be truly implemented, and a "beautiful countryside" will be built, and our beautiful hometown will also be achieved.

Disclosure statement

The authors declare no conflict of interest.

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Analysis of Risk Management of Inclusive Finance Credit Business of Commercial Banks under the New Normal of the Economy: Taking HZ Rural Commercial Bank as an Example

Ke Tan*

City College of Huizhou, Huizhou Guangdong 516001, China

**Corresponding author:* Ke Tan, hsjkkjzs@163.com

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Abstract:

Finance is the core of modern economy. With the influence of economic globalization, financial risk has a more profound impact on political economy, social and people's livelihood, and spreads more rapidly. As the most active factor in the financial system of the country, commercial banks play a key role in stabilizing the financial market and promoting economic development. Inclusive finance is a major asset business of commercial banks, which plays an important role in helping enterprises rescue, rural revitalization, and assisting small and medium-sized enterprises ^[1]. This paper takes HZ Rural Commercial Bank as an example, based on the elaboration of the development status of the bank's inclusive financial credit business, analyzes the problems and deficiencies in the bank's current credit business risk management, especially in the post-loan management, and puts forward corresponding improvement and optimization measures.

Keywords:

Commercial bank
Inclusive finance
Credit risk control
Post-loan management

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1. Introduction

The concept of financial inclusion was introduced by the Consultative Group on Poverty Alleviation (CGAP) at the UN's Annual Conference on International Microfinance in 2005, and since then financial inclusion has become an important financial practice worldwide ^[2]. Inclusive finance is a new type of financial service model and a social and economic activity that embodies the concept of equality and humanistic care. In order

to promote inclusive finance nationwide, the state has issued a series of policies to regulate and promote the development of inclusive finance, which is the need of the state to promote the transformation and upgrading of the financial industry under the new normal of the economy, promote its high-quality development, and serve the needs of social and economic development and improve people's production and living standards.

2. Development status of inclusive financial credit business of commercial banks

2.1. The policy of inclusive financial credit business has been continuously optimized

After the CPC Central Committee formally proposed the development of inclusive finance at the Third Plenary Session of the 18th CPC Central Committee, the relevant policies of inclusive finance have been continuously improved, and the corresponding credit business policies have also been continuously optimized ^[3].

In 2021, the first central document proposed the development of rural digital inclusive finance for the first time. In 2022, the government work report pointed out that more funds should be directed to key areas and weak links, and the coverage of inclusive financial credit business should be expanded. Subsequently, the central government reviewed and adopted the “Implementation Opinions on Promoting the High-quality Development of Inclusive Finance” to clarify the direction and goals for the next stage of inclusive finance development in China.

2.2. The scale of credit business of inclusive finance has gradually expanded

As of May 4, 2023, the 2022 annual performance of 12 non-state-owned listed joint-stock banks has all been released, and the achievements of joint-stock banks in inclusive finance business in 2022 have also been announced ^[4]. According to the “two increase and two control” caliber of the Banking and Insurance Regulatory Commission, from the perspective of loan balance, as of the end of 2022, China Merchants Bank won the first place with 678.349 billion yuan of inclusive small and micro enterprise loan balance, and then Minsheng Bank and Ping An Bank ranked second and third with 549.051 billion yuan and 528.226 billion yuan respectively. According to the annual report data of listed banks, in 2022, the overall scale of inclusive financial credit of commercial banks continues to maintain an incremental expansion trend, the service structure continues to optimize, the precision of service in key areas continues to improve, and the overall loan interest rate remains stable, which promotes the overall goal of gradually reducing the comprehensive financing cost of small and micro enterprises. In 2022, the total balance of inclusive

small and micro loans of 12 joint-stock banks will reach 3.99 trillion yuan, an increase of 12.49% year-on-year. Compared with joint-stock banks, the total balance of loans to inclusive small and micro enterprises of the six major state-owned banks in 2022 was 8.54 trillion yuan, a year-on-year increase of 31.99 percent. No matter in terms of scale or growth rate, state-owned banks are still the main force and leading goose of inclusive finance business in China ^[5]. From the perspective of consolidation, the balance of loans to inclusive small and micro enterprises of state-owned large banks and equity banks exceeds “half of the sky,” but the majority of small and medium-sized banks also contribute nearly half of the total. The non-performing loan ratio of inclusive financial credit business is the most important indicator to measure the quality of credit business, and only 6 of the 12 equity banks disclosed the non-performing ratio of inclusive small and micro loans in their annual reports. From low to high, it was 0.63% Industrial Bank, 0.67% Everbright Bank, 0.98% Zheshang Bank, 1.33% Bohai Bank, 1.48% Huaxia Bank and 1.70% Minsheng Bank.

3. HZ Rural Commercial Bank inclusive financial credit business development status

HZ Rural Commercial Bank is a small and medium-sized commercial bank established in prefecture-level cities to serve the local economic development. As the main force of inclusive financial development in the local financial market, it needs to fully play its role in supporting the real economy ^[6]. HZ Rural Commercial Bank has so far launched sixteen inclusive financial credit projects, including business loans and consumer loans for individuals, new citizens’ business loans for individual industrial and commercial enterprises, science and technology loans for small and micro enterprises, risk compensation fund loans for small and micro enterprises, and live pig mortgage loans for farmers with facial features. Rural Commercial Bank has the slogan of “born for agriculture, for reality and foundation,” the bank has changed its development ideas, followed the development trend, and constantly increased the financial support for inclusive financial credit business. By December 2022, the scale of inclusive financial credit

lending of HZ Rural Commercial Bank has exceeded 20 billion yuan, accounting for 33.76% of its total credit business volume.

4. Problems in the risk management of inclusive financial credit business of HZ Rural Commercial Bank

4.1. The post-loan risk management process of inclusive financial credit business is not sound, and credit defaults occur from time to time

The post-loan management of inclusive financial customers refers to a series of operation and management processes in which commercial banks conduct early warning, monitoring, verification and disposal as well as continuous marketing from the beginning of the customer's use of bank credit to the termination of the credit ^[7]. This includes monitoring and warning, on-site inspection, customer relationship management, maturity management, guarantee management, risk classification, file management, risk monitoring and management, supervision, inspection and evaluation and other links. However, in the process of post-loan management, HZ Rural Commercial Bank lacks a strict risk prevention and supervision mechanism, and the tracking and feedback of the inclusive financial credit business is not timely, especially the implementation of the post-loan management has shortcomings, and the follow-up collection is usually carried out after the credit is overdue, which makes the default risk of the inclusive financial credit business of the bank frequently occur. This reduces the quality of the loan business. HZ Agricultural Commercial Bank classifies the loan quality according to the borrower's repayment ability, which is divided into five categories: normal loan (default rate 0%), concerned loan (default rate 0–30%), subprime loan (default rate 30–50%), suspicious loan (default rate 50–80%) and loss loan (default rate 80–100%). The bank defines the latter three types of loans as non-performing loans of banks, and the non-performing loan rate is an important indicator to measure the quality and effectiveness of inclusive financial services. In recent years, the scale of inclusive credit of the bank has grown by leaps and bounds, and the corresponding risks are also increasing each year. The generation of non-performing

loans has become a prominent bottleneck restricting the high-quality development of banks. According to the credit business data of HZ Rural Commercial Bank in the past three years, the loan quality of inclusive financial credit business is not good, and the non-performing loan rate for personal entrepreneurial loans has reached 10.80%. Ways to effectively solve the non-performing loan rate has become the urgent task for the bank to develop inclusive financial credit business with high quality ^[8].

4.2. Improper use of post-loan risk management strategies for inclusive financial credit business

Inclusive financial credit business is an extension of traditional credit, and the risk nature of inclusive financial credit is the same as that of traditional credit business. The risks of credit business are caused by both internal and external factors, and the economic foundation of the customers of inclusive financial credit business is relatively weak compared with the traditional credit customers, and the ability to resist risks is relatively weak. In order to cope with the possible default risk, HZ Rural Commercial Bank did not formulate risk management strategies according to the external environment and individual business characteristics, so as to effectively identify, prevent, disperse and avoid risks, so as to reduce the losses caused by customers' default ^[8]. HZ Rural Commercial Bank has not yet built a risk monitoring and early warning tool, the combination of human control and machine control is low, and the risk control effect is not ideal.

4.3. Digital means are not used enough in the post-loan risk management of inclusive financial credit business, relying too much on third-party control

HZ Rural Commercial Bank has insufficient application of fintech in the risk management process of inclusive financial credit business, and the risk management and control process still relies on third-party companies. First of all, the customer body of inclusive financial credit business is different from the traditional credit business, mainly facing small and micro enterprises and low-income groups. The financial data provided by such customers may not meet the requirements of timeliness

and comprehensiveness, and the bank cannot predict the future solvency of such customers based on these data, which will lead to low efficiency of risk control in post-loan management. Secondly, the collection time span of the post-loan risk information of credit business is too long, and the timeliness of the data is difficult to grasp, which cannot provide reliable information and decision support for the post-loan risk prevention and control work^[9]. Finally, the construction of risk prevention and control information system is relatively lagging behind, the information means are not comprehensive, and the risk management process is more “human control” rather than “numerical control,” which makes the actual risk management efficiency unable to meet the expectations^[2].

4.4. The internal rating method and supervision of inclusive financial credit business are not perfect

Due to the wide range of inclusive finance audiences and different loan needs, HZ Rural Commercial Bank grades customers' credit status by referring to the current mainstream rating model, but this rating method is general and not applicable to all inclusive finance loan customers^[10]. In addition, the bank has not set up an independent credit rating department for the time being. The bank staff responsible for pre-loan approval and post-loan management of inclusive finance credit business are proficient in traditional business, but they have not been specially trained for inclusive finance credit business, which inevitably leads to inaccurate rating results and inadequate follow-up supervision.

5. HZ Rural Commercial Bank's post-loan risk management optimization suggestions for inclusive financial credit business

5.1. The leadership of the bank should exert great importance to, accurately grasp the risk management concept of inclusive financial credit business, and continuously improve the digital operation capability

The head office and branches should adhere to the concept of “customer-centered,” and continue to improve the risk control management mode in

combination with the operation and management practice of inclusive financial credit business. First, it is necessary to establish a risk control model that combines public and retail businesses to improve the quality and efficiency of management. According to the characteristics of inclusive business, establish the management concept of the integration of public and retail, promote the implementation of post-loan intensive management mode, and carry out work in accordance with the management idea of “full customer system detection - centralized processing of risk customers - on-site inspection of key customers.” The second is to gradually change from post-loan risk management to comprehensive customer service. Post-loan management is an important part of the whole process of credit business. It is not only necessary to identify risks in time and effectively resolve risks, but also to tap potential demand through effective customer contact, strengthen customer relationship management, and thus improve the ratio of customer retention and its comprehensive contribution ability^[11].

5.2. Improve the means of risk monitoring and improve the effectiveness of risk management

The management departments of inclusive financial credit business at all levels shall clarify their responsibilities, monitor the change trend of risk indicators of inclusive financial credit enterprises, identify, analyze and evaluate risk matters such as key regions, product and model tool application, formulate risk control objectives and risk control strategies, and effectively prevent credit risks^[12]. All credit business outlets should use the new generation of credit management information system (CMIS), to the public unified collection system (N-DAM), inclusive finance real-time data display platform and other detection system tools to carry out regular risk monitoring and analysis, for the problems found in the monitoring and analysis should take countermeasures, and timely report to the superior management authority.

5.3. Establish a digital risk control monitoring platform, use the scorecard model to refine customer stratification, and deeply integrate online monitoring with on-site inspection

HZ Rural Commercial Bank should rely on digital

technology to establish a comprehensive risk monitoring and warning platform (RAD), and use the data platform to carry out comprehensive risk monitoring on all inclusive financial credit customers and businesses within its control during the loan duration, and check, identify and predict risks and hidden dangers through automatic system detection, institutional batch detection and manual detection. This takes corresponding control measures. At the same time, the platform detection and on-site inspection should be integrated, and the score card mode should be used to refine the hierarchical management and control of customers. Customer stratification is the basis of differentiated post-loan management. Each sub-branch bank should comprehensively consider the actual credit issuance of the bank, and reasonably divide customers according to the proportion of collateral (pledge) and credit loans. When selecting the customers to be checked, the following points should be followed: after the loan, the operating settlement flow in the branch is very small with poor comprehensive management ability or asset quality. When carrying out on-site inspection, it is necessary to closely focus on the inspection points of “real business operation and reasonable credit demand,” investigate the basic situation of customers, understand the actual business situation and credit changes of enterprises, and judge whether the solvency of enterprises has changed. To judge the authenticity of customers by understanding the actual controller, shareholders and the reasons for their changes, at the same time, it is important to judge the authenticity of operation through the situation of employees, on-site operation and sales income and judge demand and rationality of fund use by invoice, contract or other bank account ^[4]. After the on-site inspection, the account manager and post-loan management post and other relevant personnel should be based on the collected information, timely assessment of customer compliance risks and solvency, for the confirmation of potential risks, import RAD platform for follow-up management.

5.4. Improve credit customer touch management, enhance customer stickiness, and improve risk management and control capabilities ^[13]

HZ Rural Commercial Bank should further improve

customer relationship management ^[14], and improve customer access in the following ways: For customers who need on-site inspection, the customer manager should carry out the customer access work simultaneously in the post-loan on-site inspection process; For small customers using the score card mode, according to the principle of customers' autonomy and willingness, collect information through online channels, and push the relevant feedback information of customers to the corresponding account manager or handling agency by the system; For other customers, the account manager will visit each customer by phone, video and make relevant records ^[5]. It accurately grasps customer needs through touch, strengthen product and policy marketing publicity, and improve the close cooperation between banks and enterprises. At the same time, it should comply with the requirements of laws and regulations, regulatory rules and business systems, fully and objectively disclose information, fully reveal risks, and minimize the probability of default risk while safeguarding the interests of customers ^[15].

6. Conclusion

Under the new economic normal, the inclusive financial credit business continues to develop, and the number of people who benefit from it is also increasing. For HZ Rural Commercial Bank, the development of inclusive financial credit business is an important starting point for its transformation and upgrading to achieve high-quality development. The bank can improve its customer structure and diversify its business risks by vigorously developing inclusive financial credit business. In post-loan risk management, whether it is the identification, measurement or management of credit risk, it is a continuous and dynamic process. In practice, it is often necessary to evaluate and reflect on the effectiveness of the risk management strategy adopted, and constantly improve the corresponding control measures to control the credit risk of commercial banks within a controllable range.

On February 28, 2022, the 24th meeting of the Commission for Deepening Overall Reform of the CPC Central Committee deliberated and adopted the Implementation Opinions on Promoting the High-quality Development of Inclusive Finance, which clarified

the new direction for the development of inclusive finance in China. Looking forward to the future, HZ Rural Commercial Bank should establish a long-term mechanism to improve the risk management of inclusive

financial credit business, and contribute financial strength to better serve the development of local real economy and help people achieve common prosperity.

Disclosure statement

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Research on the Construction of a Long-Term Mechanism for College Students' Mental Health Education from the Perspective of Home-School-Community Collaboration

Lingjie Tang*

Zhejiang College of Security Technology, Wenzhou 325016, Zhejiang, China

*Corresponding author: Lingjie Tang, wchsgpg@126.com

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Abstract:

The purpose of this paper is to explore the construction of a long-term mechanism for college students' mental health education from the perspective of home-school-community collaboration. By analyzing the current situation and challenges of mental health education for college students, this study proposes a set of systematic solutions from the three dimensions of family, school, and society. As the first classroom for individual growth, the education method and atmosphere of the family have a profound impact on the mental health of college students. Schools are responsible for professional education and psychological intervention and need to establish a sound mental health education system and crisis intervention mechanism. At the social level, by strengthening policy guidance, community service, and media publicity, strong support for college students' mental health education can be formed. Through case analysis and empirical research, this study verifies the effectiveness of the home-school-community collaboration model and puts forward specific suggestions on how to further optimize the mechanism and improve the educational effect. The results show that the close cooperation between home, school, and community is the key to building a long-term mechanism for college students' mental health education, which is of great significance for promoting the all-round development of college students and maintaining social stability.

Keywords:

Home-school-community collaboration
University student
Mental health education
Long-term mechanisms
Construct your research

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1. Introduction

With the increasingly fierce social competition, college students, as important reserve talents of the country and society, are facing many psychological pressures and

challenges, and mental health problems such as anxiety and depression have gradually surfaced, posing a serious threat to their healthy growth. The traditional school-centered mental health education model has indeed

played a certain role in the past, but due to the constraints of limited resources, insufficient professionals, and insufficient coverage, it can no longer meet the actual mental health needs of current college students. In this context, it is particularly urgent and important to construct a long-term mechanism for college students' mental health education from the perspective of home-school-community collaboration.

2. The theoretical basis of home-school-community collaborative education

2.1. Definition and development of home-school-community collaborative education

Home-school-community collaborative education refers to the coordination and cooperation of the family, the school, and society to play a joint role in educating people, and jointly assume educational responsibilities, to promote the all-round development of students. Its definition emphasizes the close integration and synergy of the three aspects of education, intending to make more effective use of educational resources. From the perspective of the development process, home-school-community collaborative education has undergone continuous exploration and improvement in China.

Taking Guangdong Province as an example, as early as 1983, the country's first parent school was established in Guangzhou, marking the real implementation of the concept of home-school co-education. After more than 40 years of development, Guangdong has moved from home-school co-education to home-school-community collaborative education, forming a new pattern of diversified education with high-level government coordination, cooperation between departments, specific leadership of schools, full participation of parents, and active cooperation of society. This development process reflects the continuous expansion and deepening of home-school-community collaborative education in line with the requirements of the new era. In summary, home-school-community collaborative education is an effective education model with a solid theoretical foundation and a clear development process, which provides an important reference for the construction of a long-term mechanism for college students' mental health education.

2.2. The relationship between home-school-community collaborative education and mental health education

Theoretically, home-school-community collaborative education is closely related to mental health education. Ecosystem theory points out that students' mental health development is affected by the school, family, and socio-ecological environment. This theory provides a solid theoretical foundation for home-school-community collaborative education, emphasizing that the three parties should work together to create a rich growth environment for students and pay attention to their individualized development. Sociocultural theory further states that students' learning and growth are not only influenced by educational institutions but also by the socio-cultural environment in an all-round and lasting way^[1].

Therefore, in promoting students' mental health, home-school-community collaborative education needs to involve a wide range of participants from all walks of life to form a synergy. Pedagogical theories also guide the combination of home-school-community collaborative education and mental health education. It emphasizes the principle of the social and all-round development of education and requires the three parties of family, school, and society to pay attention not only to the academic performance of students but also to the cultivation of their physical and mental health and comprehensive quality in the process of collaborative education. This educational philosophy is highly consistent with the goal of mental health education and jointly promotes the all-round development of students. To sum up, home-school-community collaborative education and mental health education have theoretical foundation.

3. Analysis of the current situation of mental health education for college students

3.1. Current mental health status of college students

According to the "2022 Survey Report on the Mental Health Status of College Students" in the "2022 China National Mental Health Report" jointly released by the Institute of Psychology of the Chinese Academy

of Sciences and the Social Sciences Academic Press, the survey results of nearly 80,000 college students aged 15–26 in 31 provinces (autonomous regions and municipalities directly under the central government) including Shandong and Hebei presents that the current mental health status of college students shows a worrying trend. Among the 80,000 college students nationwide, the risk detection rate of depression is as high as 21.48%, the risk detection rate of anxiety is 45.28%, and more than 70% of college students have mental health problems of varying degrees.

These problems are mainly manifested in depression, anxiety, sleep disorders, and sensitive interpersonal relationships, which seriously affect the learning and quality of life of college students. With the rapid development of economic globalization and informatization, college students are faced with multiple pressures such as academics, employment, and interpersonal relationships, which not only come from academic competition and career planning but also from the conflict between traditional values and modern culture. Additionally, some college students are confused about their self-orientation and lack of willpower and self-control, which leads to frequent mental health problems. Although colleges and universities have made efforts in mental health education, there are still problems such as insufficient educational resources and underqualified teachers, which make it difficult to meet the growing mental health needs of students. Therefore, it is particularly important to construct a long-term mechanism for college students' mental health education with home-school-community coordination.

3.2. Problems in the mental health education of college students

At present, many problems need to be solved urgently in the mental health education of college students. Firstly, the distribution of educational resources is uneven. Some colleges and universities have a low number of mental health education teachers, and the availability of professional psychological counselors is limited, making it difficult to meet the needs of the majority of students. Secondly, the content and methods of education are relatively simple, focusing on the teaching of theoretical knowledge, and lacking practical and

targeted psychological counseling and intervention. Moreover, the coordination mechanism between home, school, and society is not perfect, and the cooperation between families, schools, and society in mental health education is not close enough, and it is difficult to form an effective synergy. Furthermore, college students themselves also have misunderstandings about mental health, often regard psychological problems as personal privacy, avoid medical treatment, and lack the awareness of actively seeking help. These problems not only affect the college students' mental health education, but also harm the healthy growth of students, and it is urgent to take effective measures to solve them to build a perfect long-term mechanism for college students' mental health education.

3.3. Current problems in the mental health intervention of college students

Currently, mental health interventions in colleges and universities have exposed obvious problems in multiple dimensions. In terms of ideology and cognition, some colleges and universities confuse mental health education with ideological and political work, ignoring its unique significance in shaping students' personalities and improving psychological quality, resulting in insufficient attention and resource investment. In terms of the education system, the curriculum lacks a systematic, targeted, and effective curriculum, which cannot meet the diverse needs of students. Moreover, there are great differences in institutional construction, capital investment, and work promotion among universities, and the integration of resources is poor, making it difficult to form a joint force in education. The teaching staff is not optimistic, the number of psychological counselors is insufficient, and the teaching staff of some colleges and universities is unstable. Due to the lack of behavioral norms, some licensed teachers have disrupted the order of education such as abusing test scales in their work. Students do not pay enough attention to mental health, have weak awareness, lack knowledge, and are reluctant to seek help even if they have psychological problems. The intervention mechanism is lagging, and there is a lack of scientific evaluation and individualized programs. There are also problems of poor communication, unclear responsibilities, and inadequate resource integration,

which seriously weaken the effectiveness of education. Solving these problems is crucial to improving the level of mental health interventions in universities.

4. The role of home-school-community coordination in the mental health education of college students

4.1. The basic role of family in mental health education

As the primary environment for individual growth, family plays a vital role in the mental health education of college students. The family is not only an emotional harbor but also the primary place for shaping an individual's personality and psychological characteristics. From the perspective of mental health education, the harmony of the family atmosphere and the educational methods and attitudes of parents have a profound impact on the psychological development of college students^[2]. Through the bits and pieces of daily life, families subtly convey values, emotional expressions, and strategies for coping with stress. A warm, supportive, and understanding family environment helps to cultivate positive self-awareness, good emotional regulation, and mental resilience among college students. On the contrary, undesirable factors such as family conflict, neglect, or overprotection may become potential triggers for psychological problems in college students. Therefore, the role of the family in mental health education cannot be ignored. It is not only an important line of defense to prevent psychological problems, but also a solid backing to promote the mental health growth of college students. To construct a mental health education mechanism for home-school-community coordination, it is necessary to pay full attention to and give full play to the basic role of the family.

4.2. The leading role of schools in mental health education

School is a key place for college students' mental health education, shouldering the important responsibility and leading role of knowledge transfer and cultivating a sound personality. Most of the mental health education work in colleges and universities at the school level is based on the pattern of "big ideology and politics"^[3]. The

school helps students' mental health through diversified ways, one is to set up a compulsory course titled "Mental Health Course for College Students" to systematically teach mental health knowledge. The second is to set up a psychological counseling center with professional counselors. In particular, it is worth mentioning that Zhejiang Security Vocational and Technical College has a psychological counseling project every Wednesday, and doctors from Wenzhou Seventh People's Hospital are invited to conduct on-campus counseling and answer students' questions promptly. The third is to hold regular lectures and activities, invite experts to popularize scientific knowledge, carry out psychological development, and enhance students' psychological adjustment ability. Lastly, teachers need to pay close attention to students' psychological states in their daily teaching interactions and intervene in time once problems are found. The school also establishes mental health files for students and conducts psychological assessments regularly to dynamically grasp the mental health status of students.

4.3. The supporting role of society in mental health education

Society plays an important supporting role in the mental health education of college students. Firstly, society provides a variety of resources, and various psychological counseling institutions can provide students with professional services, such as mental health lectures, public welfare activities, dissemination of knowledge, and practical opportunities. Secondly, social public opinion and the media have a far-reaching impact, and positive publicity can guide college students to establish a correct concept of mental health and take the initiative to pay attention to their psychological conditions such as the notion that negative information can have a negative impact. Thirdly, social organizations and institutions work closely with schools and families to integrate resources and form a joint force. For example, providing professional training for schools to improve the quality of education and provide guidance to parents to improve their educational capacity. The multi-party collaboration of these societies in mental health education can create a good atmosphere and promote the long-term development of mental health education for

college students.

5. The construction of a long-term mechanism for mental health education from the perspective of home-school-community collaboration

5.1. Construct a theoretical framework and stabilize the foundation of a long-term mechanism

From the perspective of home-school-community collaboration, the construction of a long-term mechanism for college students' mental health education relies on a solid theoretical framework. The framework is student-centered, aims to improve students' mental health literacy, and emphasizes the integration and complementary advantages of multiple resources such as families, schools, medical institutions, and society. By building a platform for information sharing, resource sharing, and responsibility sharing, the optimal allocation and efficient utilization of educational resources can be realized ^[4]. Specifically, the theoretical framework includes the following core elements: first, it is student-centered, focusing on their mental health needs and development; Second, the deep integration and close cooperation of multiple subjects such as families, schools, medical institutions, and society; Third, the establishment of an information sharing platform to ensure that all parties can obtain accurate information promptly; Fourth, strengthen teacher training and professional construction, and improve the quality of mental health education; Fifth, enrich the content and form of education and stimulate students' enthusiasm for participation; Sixth, improve crisis prevention and intervention mechanisms to ensure the safety of students' mental health. This theoretical framework not only provides students with comprehensive, systematic, and professional mental health support but also lays a solid foundation for the in-depth implementation of the home-school-community collaborative education mechanism.

5.2. Implement practical strategies and promote the operation of long-term mechanisms

Firstly, it is necessary to establish a regular communication mechanism to ensure that information

is shared among families, schools, and society, and to communicate the dynamics of students' mental health on time. Secondly, we will implement personalized mental health education programs to provide customized counseling and support for different students' psychological characteristics and needs. In addition, it is necessary to strengthen the construction of mental health education teachers, improve teachers' professional quality and psychological counseling ability, and ensure the quality and effectiveness of education. At the same time, promote the socialized sharing of mental health education resources, and use online platforms, community services, and other channels to broaden the channels and coverage of education. Finally, a mental health education effect evaluation system should be established, and the education strategy should be continuously optimized through regular evaluation and feedback to ensure the effective operation and continuous improvement of the long-term mechanism. The implementation of these practical strategies will provide a strong guarantee for the mental health education of college students.

5.3. Gain insight into practical challenges and explore long-term mechanisms

In practical application, the mental health education of college students from the perspective of home-school-community collaboration faces many challenges. First of all, establish a regular communication mechanism between parents and schools, and enhance mutual trust and cooperation between parents and schools through parent-teacher meetings and home-school contact manuals. Second, it is necessary to build a platform for the integration of social resources, introduce professional mental health service institutions, and provide schools with mental health education and training, consulting services, and other support ^[5]. Simultaneously, strengthen the construction of mental health education teachers, improve teachers' professional quality and serviceability, and ensure the effective implementation of mental health education. Through these measures, we aim to promote the formation of a joint force between parents, schools, and communities to jointly build a long-term mechanism for mental health education for college students.

5.4. Improve the development mechanism and promote the professional advancement of the team

In the mental health education of colleges and universities, it is very important to build a home-school collaborative education team with excellent professional quality. At the moment, there is room for improvement in the professional knowledge reserve, practical operation skills, and home-school communication and collaboration skills. To improve the professional development mechanism, the construction of the teacher training system should be strengthened, professional training courses on mental health education should be carried out regularly, and experts in the industry should be invited to provide guidance. Concurrently, a professional assessment and incentive mechanism for the home-school collaborative education team should be established to enhance the enthusiasm and sense of responsibility of members. In addition, it will build a platform for exchange and learning to promote experience sharing and common growth. By improving these mechanisms, the professional level of the education team can be effectively improved, and a solid human guarantee will be provided for the mental health education of college students.

5.5. Improve assessment feedback and optimize long-term mechanism guarantees

The evaluation and feedback of the long-term mechanism of mental health education is the key to ensuring its effective operation. The evaluation should cover the comprehensiveness, pertinence, and effectiveness of the implementation of the mechanism, and collect the opinions and suggestions of students, parents, schools, and the community through questionnaires, interviews, data analysis, and other means. The feedback mechanism should be based on the evaluation results, timely and accurately reflect the problems and deficiencies in mental health education activities, and put forward specific

improvement measures. Simultaneously, it is necessary to ensure that the feedback channels are unimpeded and all parties are encouraged to actively participate to form a virtuous circle. In addition, the evaluation and feedback work should also focus on long-term and systematic, regularly review and summarize the operation of the mechanism, and constantly adjust and improve it to adapt to the changes in the mental health needs of college students. Through scientific evaluation and effective feedback, the long-term mechanism of mental health education from the perspective of home-school-community collaboration will be continuously optimized, providing a more solid guarantee for the healthy growth of college students.

6. Conclusion

The mental health of college students is crucial for achieving personal growth and self-worth and influencing the nation's and society's long-term development. In today's increasingly competitive society, coupled with the growing influence of family environments, relying solely on school-based mental health education is insufficient to address the complex and diverse psychological needs of college students. Therefore, it is essential to establish a comprehensive, long-term mental health education mechanism that integrates contributions from families, schools, and society. By leveraging the foundational role of families, the leading role of schools, and the supportive role of society, we can build a strong framework to support the mental health of college students. This approach will foster an environment conducive to their growth, enabling them to maintain a positive and healthy mental state in both learning and life. Ultimately, this will empower college students to contribute their knowledge, skills, and energy to society, injecting vitality into the nation's and society's development.

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The Innovation Strategy of Enterprise Economic Management Under the New Situation

Yang Zhang*

Chongqing Zongheng Engineering Design Co., LTD., Chongqing 401100, China

**Corresponding author: Yang Zhang, 350505850@qq.com*

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Abstract:

In the actual operation and management of enterprises, economic management can play a considerable role, serving the development of various work, such as decision-making, resource allocation, risk management, and performance management. Economic management has considerable value in the process of improving the production and operation efficiency of enterprises, and at the same time can enhance the overall profitability of the enterprise and empower the process of enhancing the overall market competitiveness of enterprises. Therefore, enterprises should form a correct understanding and attention to the value of economic management, and analyze their own needs in economic management based on the current new situation, to achieve more targeted innovation in economic management. Therefore, enterprises should re-examine the connotation of economic management, and grasp the value of innovative economic management to meet the new situation, to provide theoretical guidance for the practical process of adopting strategies to promote economic management innovation.

Keyword:

New circumstances
Business management
Economic control
Management innovation

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1. Introduction

With the overall shift of the domestic social economy to high-quality development, the stock competition in all walks of life is gradually fierce, which has become an external stimulus to promote the internal operation and management of enterprise innovation. There is no doubt that economic management occupies the key position in the internal work of enterprises, and it also has considerable practical value for the process of meeting the

new situation to realize overall sustainable and innovative development. However, the traditional economic management mode has been difficult to adapt to the current environment, and cannot fully realize its value, enterprises need to pay attention to economic management innovation, through the innovative management mode to reactivate the vitality of economic management, to serve the orderly realization of the long-term development goals of enterprises. In this regard, enterprises should give

priority to their own economic management status quo and solve the existing problems, to create conditions for economic management innovation.

2. Interpretation of enterprise economic management

2.1. Definition of enterprise economic management

To analyze the economic management innovation of enterprises under the new situation, enterprises should give priority to the definition and characteristics of enterprise economic management, and form a more real cognition of its related connotation, to point out a clear direction for the subsequent analysis and research of related innovation. Enterprise economic management refers to all management behavior of enterprise economic activities, covering more management content, such as resource allocation optimization, business strategy implementation, decisions, etc., the ultimate goal is author efficiency, promote the enterprise's overall core competitiveness, for the enterprise to achieve long-term sustainable development goals. With the support of effective economic management, enterprises can timely adjust their economic activities according to market competition and changes, maintain the ideal market competitiveness, and enable overall orderly innovation and development.

2.2. Characteristics of the enterprise's economic management

In a long-term, dynamically changing environment, enterprises need to scientifically adjust their economic management programs and strategies based on their development situation, capabilities, and decisions ^[1]. Therefore, enterprises should prioritize understanding the characteristics of economic management to ensure the effectiveness of adjustments. First, economic management is goal-oriented. It consistently aims at achieving economic objectives, such as maximizing an enterprise's economic benefits. These goals serve as guiding standards throughout the entire process, highlighting the goal-oriented nature of economic management. Second, economic management is comprehensive. It encompasses various aspects and requires the

integrated use of diverse tools and methods to achieve its objectives. Through holistic management, enterprises can enhance the effectiveness of their economic strategies, showcasing their comprehensive characteristics. Third, economic management is dynamic. The internal and external environments of an enterprise are constantly evolving, necessitating frequent adjustments to economic management practices. This adaptability ensures effectiveness, emphasizing its dynamic nature. Finally, economic management is objective. It does not rely on the subjective judgment or experience of managers but instead focuses on data collection, objective analysis, and targeted implementation. This reliance on data-driven decision-making underlines its objective characteristics.

3. Value of enterprise economic management innovation under the new situation

3.1. Corresponding to the sustainable development goals of enterprises

To find a way forward, enterprises need to adopt higher-quality economic management strategies ^[2]. In the current context, innovative economic management holds significant value. It aligns with the sustainable development goals of enterprises, improves economic benefits, and helps maintain competitiveness in market development. Achieving these outcomes requires enterprises to effectively grasp and implement innovative strategies. Innovating economic management in this new environment necessitates the adoption of modern concepts and methods. This approach enhances control over internal economic activities. By integrating new economic management concepts and models, enterprises can adapt their production and operational processes to market changes, enabling innovative adjustments. Furthermore, these new management approaches foster a supportive environment for innovation within the organization, encouraging employees in various roles to actively explore and implement creative solutions in their work. In summary, the value of innovative economic management in addressing new challenges lies in the adoption of advanced concepts and methods, which support the realization of sustainable development goals and drive enterprise growth.

3.2. Ensure and improve the economic benefits of enterprises

From the above connotation analysis, it is evident that the focus of economic management is on all aspects of economic activities within the enterprise. By analyzing financial statements, which accurately reflect the state of economic activities, enterprises can evaluate the specific impact of current resource allocation on these activities. This analysis helps identify directions for optimizing resource allocation. By adapting to new circumstances and implementing innovative economic management practices, enterprises can further enhance the effectiveness of internal resource allocation. This ensures that optimization efforts are more targeted, enabling enterprises to maximize the use of limited resources, improve production efficiency, reduce production costs, and ultimately achieve and sustain economic benefits. Moreover, through innovative economic management, enterprises can strengthen supply chain management. This involves improving the connection between upstream and downstream elements of the supply chain, enhancing overall operational quality, and achieving significant improvements. These efforts help reduce supply chain operational costs while simultaneously increasing economic benefits. In addition, economic management innovation plays a crucial role in financial management. It fosters the standardized transformation of financial practices, creating favorable conditions for improving economic performance.

3.3. Maintaining competitiveness in market development

Effective innovation stimulates the vitality of economic management, ensures the high-quality implementation of various economic management measures, and facilitates the orderly achievement of enterprise strategic development goals ^[3]. Through innovative economic management, enterprises can leverage modern intelligence and introduce advanced digital technologies distinct from traditional approaches. This enables the digital transformation of production processes and management models, optimizing resource allocation, reducing production costs, enhancing economic management effectiveness, and boosting production efficiency. In the context of the rapid development of the circular economy, innovative economic management also incorporates

new technological elements to support the construction of ecological civilization. This helps enterprises better fulfill their social responsibilities in ecological and environmental protection, driving sustainable and green development through innovation. In summary, economic management innovation not only enhances internal efficiency but also helps enterprises adapt to external environmental changes and maintain competitiveness within the industry market.

4. Effective strategy of enterprise economic management innovation under the new situation

4.1. Adjust the management concept for innovative economic management

By adapting to new circumstances and innovating economic management, enterprises can strengthen their economic management practices to a significant extent ^[4]. Enterprises should prioritize adopting innovative economic management concepts. Based on these concepts, they should adjust organizational structures, explore ways to improve the economic management system through innovative practices and enhance the value and performance of the economic management framework. This includes diversifying economic management methods and models while fostering transformation through innovation. Additionally, enterprises should focus on continuously building and strengthening their economic management teams. Among these efforts, adjusting the economic management concept is particularly critical, as it lays the ideological foundation for promoting other economic management innovations. This adjustment should be prioritized for exploration and implementation. Enterprises must enhance the driving force of innovation in economic management and emphasize its importance to normalize innovation within the organization. Encouraging employees to actively propose innovative suggestions during the implementation of economic management can empower the overall innovation process, ensuring it remains orderly and effective. Since economic management encompasses many aspects, enterprises should monitor the impact of innovation and adjustments throughout the entire process. By doing so, they can strengthen the guiding role

of innovative management concepts through effective oversight and control.

4.2. Adjust the organizational structure based on economic management innovation

All aspects of economic activities within an enterprise are the focus of economic management. Consequently, the organizational structure of the enterprise significantly impacts the quality of economic management. Under traditional multi-level management structures, economic managers often face excessive workloads, which can hinder efficiency. To innovate economic management in response to new circumstances, enterprises should prioritize the scientific design of their organizational structure. By ensuring and improving its scientific form, enterprises can establish a foundation for the orderly implementation of economic management innovations. Specifically, applying principles of flat management can help. By reducing hierarchical levels, enterprises can create a more flexible and streamlined organizational structure. This approach minimizes the steps required for decision-making and execution, thereby improving efficiency. Such a structure allows enterprises to significantly reduce the workload and pressure on economic managers, ensuring they have sufficient time and energy to focus on implementing economic management innovations.

4.3. Improving the economic management system based on innovative practice

Enterprise economic management focuses on the control and management of various economic activities within enterprises. It helps ensure that enterprise decisions are more accurate and reasonable, thereby promoting the overall healthy development of the organization^[5]. In practical economic management, the management system plays a significant role. On one hand, it provides guidance to economic managers by outlining clear ideas and directions for their work. On the other hand, it establishes effective constraints on work awareness and behavior, ensuring the orderly implementation of economic management tasks and offering institutional support. When adapting to new circumstances and innovating economic management, enterprises should place high importance on improving the economic

management system. This includes normalizing changes in economic management practices and using tools like problem lists to provide a solid foundation for revising system provisions. These efforts ensure that the economic management system comprehensively addresses all aspects of management practices. After improving the provisions of the economic management system, enterprises should continuously monitor its implementation and make adjustments based on practical outcomes. This approach ensures that a robust financial management system is maintained and can effectively support economic management efforts.

4.4. Attach importance to and enhance the construction of the economic management performance system

In actual economic management practices, the construction of an economic management performance system is particularly critical. It provides a clear direction for employees at all levels to achieve economic activity objectives and offers a clear set of performance indicators for assessing the effectiveness of economic management personnel. Therefore, when innovating economic management, enterprises should focus on enhancing the economic management performance system to strengthen the guiding role of performance management. To achieve this, enterprises should prioritize current economic management practices and establish clear performance appraisal objectives, covering key areas such as finance, market development, and innovation. This approach will better guide employees in completing specific economic tasks while aligning their efforts with the enterprise's long-term development goals. Simultaneously, enterprises must continuously evaluate the scientific nature of the economic management performance index system. This involves analyzing whether the performance indicators effectively measure the success of economic activities and ensuring they are accurate. Furthermore, enterprises should promote the innovation and optimization of performance indicators based on criteria such as comparability, quantifiability, and operability.

4.5. Promote the diversification of economic management methods and modes

To gain a larger share in the fiercely competitive industry

market, the economic management of enterprises must be scientific and reasonable ^[6]. The new environment not only intensifies market competition but also fosters the emergence of new economic management methods and models, offering fresh possibilities for enterprise economic management innovation. When selecting and implementing new economic management models, enterprises should objectively assess whether these approaches meet their specific needs, focusing on effectiveness. This ensures that the innovation of economic management methods is both orderly and scientifically grounded. For instance, in the preparation of financial statements, enterprises can leverage technology to facilitate the immediate collection of financial data from business activities and perform cloud-based preprocessing. This enables financial management personnel to prepare financial statements more quickly and accurately, providing a solid foundation for economic managers to complete their tasks more effectively.

4.6. Innovate and explore the ideas of digital and intelligent transformation of economic management

In the current era of digital intelligence, various new technological elements have been widely applied in enterprise management. As a result, the transformation and development driven by digital intelligence have become core aspects of innovation and growth. The same holds true for economic management innovation in enterprises. Enterprises should align their strategies with the overarching trends of the digital intelligence era and explore development ideas tailored to their unique characteristics. In this process, they should prioritize reviewing and refining their existing economic management processes. Innovation and optimization should be pursued with the foundation of building an information platform, which will support the construction of a digital economic management system. Simultaneously, enterprises must focus on digital intelligence innovation and knowledge sharing in financial accounting. By integrating financial data through information technology, enterprises can streamline accounting processes, reducing the need for separate investments in traditional accounting treatments. This approach enhances both processing efficiency and

effectiveness.

4.7. Continuously strengthen the construction of economic management personnel

The continuous development of the social economy and science and technology has driven the innovative progress of various industries, making economic management innovation a key factor in enabling industries to transition toward high-quality development ^[7]. In the process of economic management innovation, enterprises should recognize that personnel at all levels are the primary drivers of work implementation and the core foundation for fostering innovation. Therefore, after innovating economic management practices, enterprises should promptly integrate changes into their operations, organize training sessions for economic management personnel, and ensure the effective implementation of these innovations. Given that the transformation driven by digital intelligence has become essential for innovation, enterprises must also enhance the information literacy training of their economic management teams. This will help them adapt to the evolving work modes of information-based economic management.

5. Conclusion

To summarize, in the current environment of increasingly fierce market competition across industries, the orderly innovation of internal operations has become crucial for enterprises to maintain and enhance their core competitiveness. Many enterprises have already achieved certain successes in innovating their internal processes. Among these, economic management plays a particularly critical role and has always been central to the development of enterprise management. In this new context, enterprises should place a high priority on economic management and focus on exploration and innovation when improving their internal operations. This will ensure their competitiveness in the market. In practice, economic management encompasses various aspects of management, and innovation should be approached from multiple dimensions. This ensures that the results of management innovation can further enhance economic management's role in supporting the enterprise.

Disclosure statement

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