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The Embodiment and Application of the Beauty of Artistic Conception in Modern Design under the Background of the Internet

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Abstract: Land subsidence is a significant problem in many rural areas, and its management requires accurate and timely monitoring of the subsidence-prone areas. In this paper, we propose the design of a digital display platform for rural subsidence space optimization from the perspective of national space. The proposed platform leverages remote sensing data and machine learning algorithms to monitor subsidence-prone areas, identify the causes of subsidence, and develop strategies for land management and soil conservation. The platform can contribute to achieving sustainable development in rural areas by improving agricultural yield, enhancing the ecological environment, and promoting sustainable land management.

1. INTRODUCTION

Ink painting is one of the traditional Chinese painting arts and an important cultural essence of China. The artistic conception of ink and wash is a concentrated reflection of the characteristics and philosophical ideas of ink and wash painting, and it is also an important manifestation of the difference between ink and wash painting and Western painting. Modern graphic design emphasizes the transmission of information, with the design object mainly being physical objects. There are differences in expression techniques between the two, but in the creative process, ink art has reference significance for modern graphic design.

Graphic design, also known as visual communication design, uses "vision" as a means of communication and expression, creating and combining symbols, images, and text in various ways to create visual expressions used to express ideas or messages. Modern graphic design not only provides aesthetic enjoyment visually, but also emphasizes conveying a message, concept, or emotion. In China's thousands of years of development history, there are many excellent examples of packaging techniques, materials, and aesthetic forms that have been passed down to this day. The packaging structure of trees, beans, and rice provides people with clever packaging techniques. The leaves, branches, and epidermis of plants are not only natural food packaging materials, but also excellent materials for anti-corrosion and disinfection.

These traditional packaging methods have also become a unique form of continuing traditional culture. There are also various ceramic and wooden packaging, which give people a strong traditional atmosphere. In addition, since ancient times, various interests of Chinese people in "wrapping" have also been applied to the packaging of goods. The main materials for wrapping and folding are paper and various natural materials, such as zongzi leaves, lotus leaves, etc. The Chinese people endow different materials and colors of paper with unique spirituality. While wrapping, folding, and color contrast, they also give people friendly greetings and good wishes, giving the packaging a strong local flavor. This can be seen in many traditional packaging in China, such as gifts during the Chinese New Year, pastries, Mid-Autumn mooncakes, and labels and packaging on traditional wine containers, all of which emit strong emotional factors. Implicit "is one of the ways to express the beauty of artistic conception.

From an artistic perspective, 'implicitness' is a simple, comprehensive, and more memorable omission method adopted without damaging the authenticity of things and reducing the impact on their image. There are many examples of using implicit means to express artistic conception in Chinese landscape painting. Among them, Qi Baishi often uses implicit means when drawing shrimp. If the shrimp is already in water, it should be painted, but he does not draw some waves to represent water. Instead, he chooses not to draw anything, giving people infinite imagination space. In the ancient Song Dynasty, the "Tai Bai Xing Yin Tu" created by Liang Kai fully expressed the temperament and talent of the "poetic immortal" with just a few strokes.

2. THE PROPOSED METHODOLOGY

2.1 The Beauty of Traditional Chinese Artistic Conception

Since ancient times, China has highly valued the creation of "artistic conception", considering it as the highest level of aesthetics, and using the presence or absence of "artistic conception" as an important standard to measure Chinese ink painting art. Ink and wash art utilizes methods such as lines, ink, and color to express the "qi" and "rhyme" inherent in the screen, creating strange artistic effects. It highly summarizes and concentrates real life, breaks through the boundaries of time and space, cleverly utilizes the relationship between virtual and real, and gives people a wonderful artistic realm and infinite imagination space. Graphic designer Wang Xu believes that the greatest inspiration for him from ink and wash art lies in the artist's handling of space and the interrelationships between objects in space. He said, "I really appreciate the ancient people's handling of the relationship between fish and water in ink painting. They didn't draw water, but people still understand fish swimming in water." This reflects the painting philosophy of ink painting, which is "planning white when black," "combining virtual and real," and "there is a wonderful realm everywhere without painting," as well as traditional Chinese philosophical thinking.

Modern graphic design focuses on publicity, and both commercial and cultural graphic design works require

conveying certain information to the audience, that is, enabling them to understand. The subtle transmission of necessary information through image information allows creators and audiences to communicate and exchange in a time and space, which puts forward requirements for the selection of image information. Elements that are too abstract and artistic are clearly not applicable. Ink and wash elements have profound cultural connotations, including philosophical ideas, and can express the author's emotions. Therefore, when choosing ink and wash elements, it is necessary to deeply analyze the essential meaning of the selected elements, make the elements match the theme, and accurately convey the information that graphic design works need to convey.

For example, in Zhang Yimou's new work "Shadow", a large amount of ink and wash elements are used in the poster promotion, especially in the poster of the movie title. A simple "shadow" character written with a brush, which not only conveys the movie title, but also renders the mysterious color of the movie through the transformation of the brush strokes. Combined with the words "Zhang Yimou's works", the audience unconsciously creates a preconceived desire to see it, the publicity effect is very effective. In the analysis of an expression, the first step is to explore its cultural origin. In the analysis of cultural origins, writing is also a fundamental and most effective means of excavation. It is no exaggeration to say that a written culture can establish a kind of thinking and dominate an artistic style.

To study the artistic conception of traditional Chinese poetry, the first step is to excavate it from our Chinese characters. Chinese characters originated from hieroglyphs and are fundamentally different from the widely used pinyin script in the modern West. Ideographic writing places more emphasis on the vividness of expression, while Pinyin writing emphasizes the standardization of expression. It can also be said that hieroglyphs emphasize conveying emotions and meanings, while pinyin scripts emphasize inductive descriptions. In today's globalized commodity economy, packaging and goods have become integrated. Packaging, as a means of realizing the value of goods and their use, is playing an extremely important role in the fields of production, circulation, sales, and consumption. Today's packaging no longer only meets the needs of material functions, but also provides people with spiritual needs based on meeting material functions. The issue of artistic conception beauty in packaging design art can be summarized as that of packaging design art.

2.2 The Beauty of Artistic Conception in Modern Packaging Design

As is well known, painting expresses object images through colors, dots, lines, and surfaces, music expresses object images through melody and rhythm, and the artistic image of packaging design is generated through its various constituent elements and unique small space composition, with its own formal beauty principles. The packaging design formed by the interweaving and fusion of different constituent elements has different artistic forms, and different artistic forms have different artistic beauty. The changes in form, the comparison of material texture and functional structure in the constituent elements are conveyed through visual information, and the goal is to create a harmonious and unified artistic conception in the emotional world of packaging design. For this logo, Mr. Kan Daiqiang has put a lot of effort into it. He not only needs to fully understand the Eastern concept, but also needs to apply it to the design to design such an excellent work.

The patterns in this work imply meanings that can be pondered for a long time and are rich in a strong Eastern cultural atmosphere. At the same time, when discussing the process of creation, Mr. Kan Daiqiang also told us three experiences: conception - the idea comes first, and the action takes the spirit; Innovation - connecting the past and the future, breaking through the old and creating new; Flexible use - suitable for the body, flexible and vivid. This can not only showcase the artistic conception in landscape painting, but also further arouse people's attention to Lao Zhuang's philosophical ideas. The application of ink and wash elements in modern design, while maintaining the expressive form of Chinese ink and wash art of "freehand brushwork in form", is not limited to the traditional black and white system of ink color, but also focuses on expressing the color sentiment and hazy charm of ink and wash.

In some advertising works, the ink and wash forms that are rich in color expression have become clear and bright under the careful treatment of modern digital technology. The design style is simple and concise, the form is beautiful, and the artistic conception is fresh, achieving a supreme artistic conception of "stillness, emptiness, and emptiness", fully demonstrating the inherent spiritual temperament of the work, and leaving a deep impression on the audience. The fusion of Eastern traditional culture and Western modern design makes these works highly visually appealing and culturally significant, creating a design language that is internationally recognized in the high unity of national and global identity.

Ink and wash painting is a pure art of painting, which is the expression of the painter's main emotions and serves the spiritual level of the painter and the audience. The philosophical beauty of "virtual and real coexistence" makes ink and wash painting produce different ideological insights when people appreciate it, and even at different times and different moods, the same person will have different ideological resonance with the same painting. Therefore, ink and wash painting are used for "tasting". Modern graphic design meets the aesthetic needs of modern people. In a fast-paced lifestyle, few people can relax and spend time "tasting" a work. It is already rare to spend a few seconds on a graphic design work, which requires graphic design works to convey as much information as possible in the shortest possible time. In graphic design works, it is necessary to selectively choose ink and wash elements, consider the fit between the two, consider the relationship between form and content, and avoid blindly pursuing the application of ink and wash elements, otherwise it will only backfire.

3. CONCLUSION

Ink painting is a very excellent cultural treasure, with a profound artistic conception and a combination of reality and emptiness. It has been loved by literati and literati since ancient times and has been passed down as a "poetic and painting culture" to this day. In ink painting, one can glimpse the ancient people's research and interpretation of religious philosophy, as well as the painters' thoughts and emotions. There are countless literati who express their feelings for the mountains and rivers, and they have passed down one after another beautiful stories. Discussing the mechanism of the emergence of culture from a sociological theoretical perspective provides a new perspective for the study of culture. This perspective may also provide some inspiration for discovering more connotations and values of culture.

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Research on the Design of Children's Toys Based on Ergonomics and Physiology

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Abstract: Based on relevant theories such as child development, emotional design, and child cognition, the research target is aimed at children aged 3 to 8 years old. The change in the age range of 3-8 years old children from being ignorant to improving their minds is enormous. The application of developmental theory research can better grasp children's demands and characteristics of growth and change. The article designs experiments and uses experimental data to confirm that children of different ages and genders have different needs for colours, shapes, materials, functions, and other aspects. By using experimental methods, one can better grasp the design elements. The experimental evaluation section mainly adopts subjective questionnaire survey method, children's self-rating scale method, semantic difference method, and interview method. On the other hand, organize and analyse experimental data and results.

Keywords: Children's Toys, Ergonomics and Physiology

1. INTRODUCTION

With the relaxation of the second child policy, as a special consumer group, children's furniture has an increasing market share. In the design of children's furniture, it is necessary to use theories such as child psychology, ergonomics, design psychology, and market behavior to design reasonably. Children's furniture design always revolves around the main line of children's physiological and psychological characteristics, to make the development and design of children's products meaningful. Based on the research results of Chinese child psychologists and long-term educational practice experience, the child population is divided into six main stages: infancy, children, preschool children, childhood, adolescence, and early youth.

This article mainly studies furniture design for preschool children aged 3-6 and 7. Attention is a characteristic of understanding things, which mainly refers to the direction and concentration of psychological activities formed by people in the process of understanding things. If there is no conscious participation in all cognitive processes, it forms an absent-minded state. Preschool children are very lively, difficult to concentrate for a long time, and unable to stably engage in a certain activity, which is related to the objects they observe and learn from. Preschool children tend to be more focused on lively, vivid, and distinct objects, while they are more easily distracted from objects with simple, abstract, and complex meanings.

In addition, the attention range of preschool children is smaller than that of adults, so it is important to avoid having children pay attention to multiple objects at the same time and avoid the occurrence of attention disorder in preschool children. With the development of the global economy and the increasing living standards of the people, the material and cultural needs are also becoming increasingly diverse, and the field of children's furniture design has also developed rapidly. Designers have also begun to pay attention to the uniqueness of children's furniture in terms of color, material, and shape .

Based on theoretical research, identify the deficiencies in the current design of children's furniture. Based on the current situation of children's furniture design in China, multiple examples of children's furniture design are studied, analyzed, and compared. Identify some common issues in current furniture design and propose practical design methods. At the same time, combined with specific analysis of design practice, it provides a certain reference and basis for future furniture design of the same type . From the literature review and market analysis in this article, it is found that the current children's furniture is greatly influenced by adult furniture. Designers often overlook the fact that 'children are not shrinking adults', and designed furniture products are difficult to meet the needs of children. At the same time, there is also very little experimental data on the furniture needs of children aged 3-8 and their preference evaluation data.

This chapter mainly analyzes the correlation between children's developmental characteristics and furniture product design elements through experimental design. Summarize children's preferences for furniture shapes, colors, and materials, providing theoretical support for subsequent design principles and practices. The main research method is based on user psychological evaluation, and a children's self-participation experimental design is designed using quantitative analysis. The specific experiments are as follows. According to the functional size range of children's furniture during their growth period, it is best for children's furniture to have the ability to adjust and change functions according to changes in height, so that children are always in the best physiological state during use and extend the life cycle of the furniture. The "Growth Dining Chair" designed by Norwegian designer Peter Powick fully considers the different needs of different age groups, adapts to the height changes of children, and accompanies their growth.

2. THE PROPOSED METHODOLOGY

2.1 Research Methods and Experimental Analysis of Children's Furniture Design

Children's furniture should pay attention to considering their growth potential and can be adjusted in size within a certain range to meet their growth needs. Based on the psychological characteristics of preschool children, the following principles need to be upheld in furniture design: firstly, artistry. Furniture is used in daily life, and its shape is its external manifestation. Preschool children's homes should be lively, concise, generous, lively, symbolic, and artistic. Avoid cumbersome and cumbersome designs. The color of furniture should be simple and generous, harmonious, and eye-catching,

to avoid creating a disorganized visual experience for preschool children. It should be possible for preschool children to enhance their cognitive and intellectual abilities through simple and charming furniture use, stimulate their imagination, and fully tap into their innocent and lively qualities.

Secondly, interest. Excellent children's furniture should satisfy their curiosity, allowing them to unleash their imagination and activate their thinking under the guidance of furniture. Therefore, furniture form design should have a certain level of interest, which can satisfy children's curiosity, enable them to learn knowledge and abilities during the use of furniture, and cultivate independent thinking and practical abilities in the use of furniture. The main behavior of children aged 6-8 is learning, and children begin to understand and understand the world through learning. Therefore, cultivating good learning habits and behavioral patterns in children is very important. Unlike children aged 3-5, children aged 6-8 begin to consciously participate in collective activities. During this period, children often purchase products based on their intuition, and their preferences for products have a great degree of conformity. For example, they are obsessed with cartoon anime, often interested in products with cartoon characters, and have a strong desire to purchase.

Children's cartoon furniture often has a mysterious color, and children can generate imagination during use, satisfying their curiosity. The physical and mental health development of children is of utmost concern to all parents, and children aged 3 to 8 still lack independence and self-protection abilities. Parents usually allow their children to live independently between the ages of 3 and 8 in order to cultivate their children's independence. For children at this stage, the younger the age, the poorer their independence, the stronger their dependence on their parents, and the more important it is to have a sense of security in furniture. Therefore, the safety of furniture design needs to be based on the structure, size, color, material, and other aspects of furniture, combined with children's psychological security, to help children grow up healthily. In the design of furniture for preschool children, based on meeting practical functions, it is also necessary to meet the emotional needs of children. Through various design elements such as shapes, colors, and textures, emotions are integrated into the design work, achieving a high degree of unity between function and spirit.

2.2 Design principles for children's furniture products

At the same time, as a gathering place for knowledge elites, Due to the lack of life experience and language knowledge development in preschool children, they mainly meet and understand external things through intuitive expressions. Their main thinking characteristics are specific visual thinking, and their understanding of color is also based on specific things, without a systematic understanding of color formation. Preschool children prefer bright and vibrant colors, such as red flowers, green grass, and blue sky. According to relevant research, preschool children are particularly fond of bright colors such as blue, white, and red, with a particular preference for solid colors. The soft color scheme is relatively attractive to preschool children.

So, when designing the color scheme of preschool children's furniture, it is important to choose the colors that children like, use the colors that children like, and choose a soft color fusion when color matching, to have a visual aesthetic. For example, white can be paired with light blue, white can be

paired with pink, etc., to make furniture more lively and vivid, satisfying the imagination of preschool children. Specifically, similar color matching methods, comparative color matching methods, etc. can be used. To further analyze the relationship between furniture material samples, a multi-scale analysis was conducted on the material samples based on intentional word factor analysis. Multivariate scale analysis is a statistical method used to reduce the number of factors . Because there are many emotional intention factors in each furniture material sample, multiple scale analysis can extract the main factors and determine the main representative intention words of the sample.

After extracting the factors, a feasibility test is conducted to test the scientificity of the experimental method. Playing is a child's nature. It is the common wish of parents and children to enjoy the joy of playing while studying. The friendly, natural, and return to nature characteristics of furniture can effectively help children cultivate attention and diffuse thinking. During the process of playing games, children are involved in behaviors such as rolling, rotating, and climbing. Taking tumbling movements as an example, designers conducted a survey and analysis on children's tumbling movements and found that most children always enjoy tumbling and playing in bed. Cartoon shaped children's furniture is a commonly used technique in children's furniture, and most cartoon patterns directly use cartoon images without modification. To enhance artistic pursuits, simplified cartoon symbols, comparative changes, digitization, and other methods can be used to design and apply cartoon elements; Children's furniture with geometric shapes is loved by parents and children due to its simple and generous appearance. Sharp corners should be avoided in design to prevent harm to children.

In the design of children's furniture, it is possible to use children's personality traits such as liking natural forms and small animals to design simulated and biomimetic children's furniture. Preschool children's furniture design needs to combine the function, color, material, and form of the furniture together to design a unified visual effect and psychological perception. There are three common types of shapes in preschool children's furniture design, namely cartoon shapes, biomimetic shapes, and geometric shapes. Firstly, cartoon style. Cartoon shaped furniture is the application of cute and vivid cartoons from cartoons to children's furniture design, making functional furniture a good companion for preschool children's daily life and spending time with them day and night. Most preschool children are interested in cartoon styling, and cartoon characters are the best companions.

3. CONCLUSION

With the continuous progress and development of society, most families in China are now only children, and children's dependence on their parents has become stronger. We hope to have more and better communication with our parents; Given this phenomenon, we should consider the interaction between children and their parents more when studying children's furniture design. Therefore, in the research of children's furniture design, the use and needs of adults should also be considered. Summarize the correlation between children and furniture design elements from experimental data, so that design practices can meet the developmental psychological, physiological, and emotional needs of children aged 3-8. By conducting research on the shape, color, material, and function of furniture, analyzing experimental data, and establishing design principles. The summary of furniture

product design is mainly summarized from several aspects such as the psychological security, functional needs, and growth potential of the product for children.

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English Learning Goal, Attribution and Motivated Strategies among Chinese

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Abstract: This article aims to provide a comprehensive understanding of the situation of students and teachers. From multiple subjective and objective perspectives, it analyzes the reasons for the lack of English learning motivation among local students and uses attribution theory as guidance. In response to the reasons for their lack of motivation, relevant literature is consulted, and corresponding solutions are provided. It has long been widely concerned by foreign language learning researchers. The study of foreign language learning motivation focuses more on combining motivation theory with school foreign language education scenarios. Only by stimulating learners' English learning motivation and promoting the development of other factors through motivational education can students' English learning be better promoted.

Keywords: Learning Goal, Motivated strategies, English Learning

1. INTRODUCTION

In terms of teachers' own abilities, most of the primary and secondary school teachers in this region are graduates of vocational schools or normal schools, and some even have personnel from other professions unrelated to education temporarily recruited into the teaching team, which seriously affects the improvement of education quality and teaching level. On the other hand, teachers have a single teaching method, monotonous teaching methods, are not good at using modern teaching models, and do not change their own educational and teaching methods, which can also affect students' learning interests and motivation.

On the other hand, the local area is a gathering place for ethnic minorities, and for many students, English is their third language. Compared to their second language learning of Chinese, it lacks the corresponding context and is relatively less used, leading to a lack of interest in English learning among students. The lack of motivation has a significant impact on students' grades in various subjects, but for this region, it has a relatively large impact on English grades. The former consists of basic factors such as observation ability, memory ability, thinking ability, and imagination ability, while the latter includes basic factors such as motivation, interest, emotion, will, temperament, and personality. Nonintellectual factors do not directly undertake tasks such as receiving, processing, and processing information inside and outside the body. The direct constraints of nonintellectual factors on the cognitive process are reflected in their driving and regulatory effects on the cognitive process. In a sense, motivation plays a central role in the structure of nonintellectual factors. Wenden found that learners' learning beliefs fall into one of these three categories, despite their significant changes.

Horwita used a questionnaire on language learning beliefs to obtain the learning beliefs of 32 average level students from different ethnic backgrounds who studied English majors at a key university in the United States. The results showed that 81% of learners believed that people with special abilities were more confident in their own abilities when learning a foreign language. They believe that English is a foreign language of ordinary difficulty, while more difficult languages are everywhere. Through conversations with other teachers and the performance of classmates during the teaching process, it was found that the motivation of applied undergraduate students in English learning decreased. In response to this phenomenon, methods such as teacher-student conversations and survey questionnaires were used to analyze the reasons for the weakened motivation.

The survey found that the motivation of applied undergraduate students to learn English is influenced by many factors, including internal factors such as students' interest in English, difficulties encountered in the learning process, and the level of emphasis placed on English. In addition, external factors such as their love for teachers, English learning environment, and understanding of textbook content are also factors. Through conversations with other teachers and the performance of classmates during the teaching process, it was found that the motivation of applied undergraduate students in English learning decreased. In response to this phenomenon, methods such as teacher-student conversations and survey questionnaires were used to analyze the reasons for the weakened motivation. The survey found that the motivation of applied undergraduate students to learn English is influenced by many factors, including internal factors such as students' interest in English, difficulties encountered in the learning process, and the level of emphasis placed on English. In addition, external factors such as their love for teachers, English learning environment, and understanding of textbook content are also factors.

2. THE PROPOSED METHODOLOGY

2.1 The Theoretical Basis of English Learning Motivation

The awakened state of the original motivation can be caused by internal reasons or external reasons within the individual. The early theory of drive reduction (drive) believed that this primitive driving force was human needs. These needs constitute internal stress, and motivation is a desire to alleviate this pressure to meet the needs. Behaviorism holds that human behavior is governed by external forces. Social constructivism believes that the original motivation for each person's behavior is different, but their motivation is influenced by the social environment. Based on the intensity

of learning motivation, it can be divided into dominant learning motivation and auxiliary learning motivation.

In general, students' learning motivation is not singular, but always consists of a motivational system consisting of dominant learning motivation and several auxiliary learning motivations. The dominant learning motivation is strong and plays a leading role. However, auxiliary learning has weak motivation and plays a secondary and auxiliary role. The dominant learning motivation changes with the growth of learners, and in a certain academic year, there is only one dominant learning motivation, while there may be several auxiliary learning motivations. If the driving direction of both is consistent, meets social requirements, and is conducive to growth, they should be affirmed and encouraged.

The interest of applied undergraduate students in English learning is not strong. Therefore, a questionnaire survey was conducted among students majoring in food and marketing in 2018. According to the survey results, only 11% of the students themselves like English as a subject, while 79% of the students' main motivation for English learning is to pass the CET-4 and CET-6 exams and prepare for the postgraduate entrance examination. 7% of the students want to travel abroad, and English learning facilitates the improvement of communication skills, 2% of students believe that being able to speak English fluently will impress others. From it, for applied undergraduate students, their learning motivation is mostly due to the existence of exam pressure, and they reluctantly learn English to take the exam. However, due to the external factor of exam pressure, the effectiveness of learning English is not satisfactory. It can enhance their motivation for English learning, enable students to develop positive learning behaviors, and persist in learning even in the event of failure.

However, students' attribution methods can also be greatly influenced by their own teachers. Therefore, in daily educational and teaching activities, teachers should actively pay attention to students' attribution reactions and characteristics, conduct specific analysis based on each student's own characteristics, respect their individual differences, and actively help students analyze which internal and controllable reasons lead to success or failure when they need it, What factors are external and uncontrollable, and provide an accurate evaluation of the reasons for success or failure. The concept of control refers to whether an individual considers themselves to be the controller of their own behavior.

The degree to which learners control their own language learning greatly affects whether they continuously invest energy and time in learning. The third factor that affects individual motivation is environmental conditions. Specifically, in terms of teaching, it refers to the individual characteristics, teaching methods, teaching facilities, and textbooks of teachers. The personality traits of teachers can affect students' learning motivation, and teachers who like to have high expectations of students and use praise can stimulate students' learning motivation.

2.2 Goal Strategies for Chinese People to Learn English

On the contrary, if students attribute the success of English learning to external and unstable reasons at this time, while failure is attributed to internal, stable, and uncontrollable reasons, it will reduce their motivation for English learning in the next step and even generate negative emotional reactions.

Therefore, the unreasonable attribution of students will also have a series of negative effects. According to the theory of Williams and Burden, the greater the value given by the target task itself, the greater the incentive value it provides to individuals. Therefore, individuals tend to decide to complete the task and are willing to continue to put in effort. Eels believes that task value consists of four parts: interest, achievement value, utility value, and estimated cost.

Interest (intrinsic value) is determined by the happiness brought to individuals by completing tasks. The value of achievement is determined by the importance of the task itself. The practical value is determined by the rewards brought by completing the task. The estimated cost refers to the cost of energy, material, and time spent on completing a task, which is the negative value of the task. Firstly, regarding learning concepts, the survey shows that most top students live and learn in a second language environment. To learn a second language well, middle school students emphasize learning grammar and vocabulary in the text. Students with poor grades mainly rely on their personal qualifications or self-awareness developed during their studies.

Secondly, regarding motivation, we can find that most top students have clear learning motivations, such as going to college or being interested in this language or preparing for their future. Middle school students learn a second language mainly to pass exams or find a good job. And those with poor grades only learn a second language to pass exams or under pressure from teachers or parents. In response to issues such as students' weak interest in English learning and a weak learning atmosphere, teachers should not only improve their professional quality, but also make teaching adjustments based about each class of students. They should design some links to stimulate students' enthusiasm, such as pre class speeches, watching TED speech videos, discussing questions, and expressing opinions, etc., to stimulate students' interest in learning.

In addition, the emergence of new media has also established a platform for interaction between university teachers and students. Teachers can arrange preview homework, distribute task decomposition, arrange homework after class and other ways through WeChat group, WeChat official account, QQ group and other media to change the mode that students only obtain knowledge from teachers in English classes into students' autonomous learning mode. Thus, creating a good learning atmosphere, which over time drives the learning atmosphere of the entire class, forming a virtuous cycle. Attribution style is a relatively stable attribution tendency formed by individuals during the long-term attribution process. Because each student has their own personality traits, life experiences, and cognitive styles, their attribution to learning may also differ.

3. CONCLUSION

When teachers try to improve students' motivation, they should not only pay attention to the specific motivational factors that have a significant impact on motivational behavior, but also comprehensively consider the relationships between different motivational factors. Teachers can consciously improve teaching methods to enhance students' sense of achievement in foreign language learning, to achieve the goal of changing students' learning attitudes. Previous research and this survey have fully demonstrated the importance of these three factors in the process of second language acquisition. Therefore, teachers should help students change their learning

concepts, stimulate their maximum learning desire, and teach them how to effectively apply learning strategies.

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Online Video Super-Resolution Optimization of English Ecological Teaching Based on Information Display Cloud Platform

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Abstract:This information platform has a reasonable layout and good user experience. In order to solve the different division of labor among departments at all levels, a concise data table of authority allocation has been developed, so that users can more intuitively see the statistical functions of the information platform. The column chart relies on the data mining technology of artificial intelligence to analyze the characteristics of learners, and uses technical means to design smart classrooms, promote language learners' autonomous learning, and establish dynamic and complete learner files, so that the language learning process is no longer a linear process. On the basis of convex set optimization, an efficient and robust video sequence resolution enhancement algorithm is proposed by making full use of maximum posterior probability and convex feature projection technology.

Keywords: Online Video Super-Resolution, English Ecological Teaching, Information Display Cloud Platform

1. INTRODUCTION

In recent years, major breakthroughs have been made in artificial intelligence technology. After the Internet and the Internet of Things, big data, cloud computing, speech recognition, [1] and deep learning have become new hotspots. Driven by relevant information and communication technologies, artificial intelligence uses new algorithms and educational ecology to study various educational phenomena and their causes based on ecological principles, especially the principles and mechanisms of ecosystems, ecological balance, and co-evolution [2]. An interdisciplinary subject that grasps the law of educational development and explains the trend and direction of educational development.

The college ecological English classroom regards teachers, students, and the educational ecological environment as an interrelated and interactive educational ecosystem [3]. Compared with the traditional classroom, its most notable feature is that its teaching is based on the basic principles of education ecology, and education informatization plays a prominent role in promoting the innovation of teaching methods and the reform of teaching process [4]. Through the use of information technology, teaching resources have been optimized and integrated, especially today when information technology is widely used in all walks of life [5].

Cloud service is the increase, use and interaction mode of Internet-based related services, usually involving the provision of dynamic, scalable, and often virtualized resources through the Internet, and the application layer obtains the required resources and Service, service can be IT products [6]. In the past 10 years, for the writing teaching mode of undergraduate English majors, based on Internet +, corpus, online and offline mixed teaching, flipped classroom, micro-class, online automatic review system and other network platforms and modern information technology. The teaching mode of English writing has received extensive attention [7].

In order to obtain high-definition images, the super-resolution (SR) algorithm was first proposed in the literature [8], which uses signal processing technology to obtain a high-resolution (HR) image from multiple low-resolution (LR) images. Since then, the resolution enhancement method has become a research hotspot in image processing and video communication [9]. The author uses the spatiotemporal features between video frames to optimize the fast-learning reconstruction algorithm based on deep convolutional neural network and proposes a VSR reconstruction algorithm based on spatiotemporal features and neural network [10].

Improve the level of urban comprehensive management, further increase, and improve the functions required for grid-based and information-based social management in the new era, realize a people's livelihood service system based on people's livelihood security [11], a stability maintenance prevention and control system with early warning and prevention as the first step, and achieve efficient A comprehensive command system that requires smoothness. Improving the resolution of images through signal processing technology is the worthiest of in-depth research and discussion. In this method, signal processing can be performed on multiple low-resolution images observed. Get high-resolution images [12].

This resolution enhancement technology. At the Boa Forum for Asia in April 2018, the speech of the guests was instantly converted into text and translated into English in real time on the big screen [13]. This is after AlphaGo, artificial intelligence has once again attracted widespread attention from the global public. The educational ecosystem refers to the mutual influence, interaction, harmonious symbiosis, dynamic balance, and impact on the external environment formed by various elements in accordance with certain laws, interaction and dependence, energy conversion, material circulation and information transmission through regular movement. A unity that adjusts accordingly [14].

Emphasize the role of students' main body in practice, and build a harmonious, free, fair, united, cooperative, and mutual learning atmosphere for college students, so as to achieve the purpose of improving classroom teaching efficiency and enhancing teaching effects [15]. English teachers in higher vocational colleges should adapt to the trend of the times, think deeply about ecological factors such as teachers, students, and teaching environment, and think about how to

establish an information-based English classroom, so that each "ecological factor" can form an interdependent and interconnected ecosystem [16].

Establish a cloud environment including data, computing, storage, network, service, software, security system, etc. Tobacco commercial applications in various cities no longer need to deploy the underlying physical environment, data environment and security environment [17], through front-end development and cloud platform The common interface can realize the relevant application and service requirements. Therefore, it is an urgent task for college English writing teaching to explore the integration of network platforms and modern information technology with English writing teaching, to create a sustainable writing teaching mode suitable for Chinese English learners, and to truly improve college students' English writing ability [18].

2. THE PROPOSED METHODOLOGY

2.1 The Information Display Cloud Platform

Based on the theory of education ecology and combining the characteristics of business English teaching, the author tries to construct a holistic, dynamic, harmonious, and balanced business English ecological teaching mode, in order to help improve the quality of business English talent training and the innovation of business English teaching mode. With the application of information technology, the concept of higher vocational English teaching is also in a state of rapid development.

Novel and advanced teaching methods are widely used in practical teaching. Although the industry is gradually unifying the core business process informatization work platform, there are still many self-built systems developed by municipal-level tobacco industrial and commercial enterprises based on their actual needs. These independent information systems cost a huge amount of money. On the one hand, a set of basic environments is configured according to a set of systems. Association mapping learning is to learn the association relationship between high- and low-resolution image blocks, which is used to achieve the goal of super-resolution image blocks. The deep convolutional neural network is used to learn this relationship, which makes full use of the superior fitting performance of the deep convolutional neural network for nonlinear relationships. Through the demand analysis of this platform system,

The function of the platform system has been basically determined. Based on the data flow of the JAVA platform, the data flow is drawn into a data flow diagram. The purpose of the data processing process and data flow is to solve and discover the problems that occur in the operation of this data in the system. In the research of super-resolution reconstruction technology of video image sequence, this paper studied the existing algorithms, and found that most of the existing video super-resolution reconstruction methods are based on motion estimation super-resolution reconstruction technology. Understand the advantages of intelligent algorithms in the optimization process.

2.2 The English Ecological Teaching

The educational ecosystem refers to the mutual influence, interaction, harmonious symbiosis, dynamic balance, and impact on the external environment formed by various elements in accordance with certain laws, interaction and dependence, energy conversion, material circulation and information transmission through regular movement. A unity

that adjusts accordingly. College English, as a basic course for undergraduate language learning, is a quality education course that leads students to experience the world's advanced culture and cultivates international awareness. It plays a vital role in the future development of Chinese college students.

Therefore, the content of education should be continuously enriched and improved in college English classrooms, and mobile learning should be integrated to improve the comprehensive application ability of college students in English. Think about the difference between traditional teaching methods and information-based ecological classroom teaching mode through open classes and discuss the learning effect by analyzing students' learning situation. Decentralized development and construction inevitably enhance the intersection between all levels of the industry, development, and suppliers, and increases the risk of engineering, material, and service procurement projects. It is difficult for the supervision and discipline inspection force to carry out the detailed inspection of many informatization projects from evaluation, project establishment, implementation, acceptance, application, etc., and it is easy to breed corruption.

A total of 90 students from the 2019 English-major undergraduate teaching class of Qingdao Binhai College were selected as the research objects to carry out research on the construction of an English ecological teaching model with a total of 16 weeks and 64 hours in one semester. Among them, two tasks are completed in the first and second weeks. Teachers and students have their own characteristics and personalities. Different from traditional classrooms, the evaluation standards and methods become more diverse. This requires teachers to respect the differences of students and build a harmonious and equal teacher. In the college English ecological classroom, a more complete, objective, and scientific student's learning situation, grades and learning situation in the classroom, in the classroom and outside the classroom can be obtained through the mobile learning platform. This not only breaks the barriers of traditional single evaluation, but also effectively solves the problem of missing data in college English evaluation.

2.3 The Online Video Super-Resolution Optimization for English Ecological Teaching

Only an open ecosystem can realize free energy conversion, material circulation and information transfer between internal elements and the external environment. Therefore, under the business English ecological teaching mode, the teaching objectives will be adjusted in time according to the changes in social needs. The construction of a multi-dimensional interactive English teaching environment is an important starting point for the construction of an information-based higher vocational English classroom ecological teaching. The ecological classroom teaching view holds that the interaction between teachers, learners and teaching environment is the main process of foreign language learning.

In the learning process, although the neural network with more network layers and smaller convolution kernels helps to obtain better learning effects [7], in order to better balance the cost of time and efficiency, the author uses three layers. The convolutional neural network learns the association mapping between high- and low-resolution image patches. The low frequency information is contained in the approximate component. Therefore, the algorithm does not perform the convex set projection operation in the image space domain but

uses the information in the adjacent frames to update and increase the high-frequency wavelet coefficients of the current frame in the wavelet domain to achieve the purpose of super-resolution reconstruction. Optimization refers to finding a set of parameter values under certain constraints, so that some performance indicators of the system can be maximized or minimized. Optimization technology has played a huge economic benefit in industry and people's daily life [43, 44]. Post it to the WeChat group for students to learn and think about. At the same time, the teacher uploads a video about the investigation status of college students using mobile phones in different colleges and universities in the WeChat group or makes a micro-lecture video in advance. In order to more accurately describe the relationship between the sets of similar graphics blocks to be fused by matching, balance the extracted spatiotemporal features, the geometric mean is used to calculate the fusion weight of the image block to be fused.

3. CONCLUSIONS

In this paper, an improved video sequence super-resolution reconstruction algorithm is proposed. The algorithm uses a combination of a simple spatial domain preprocessing gradient estimator and wavelet domain inter- and intra-frame POCS reconstruction. The theory of educational ecology allows people to re-examine the teaching relationship, discover the beauty of life personality, respect the diversity of life, and pay attention to the all-round development of students; analyze the various ecological factors in the classroom teaching ecosystem from an overall dynamic perspective. The purpose of fast super-resolution video frame is realized. In order to further utilize the spatiotemporal relationship between frames to optimize the reconstruction results, the author adopts spatiotemporal feature similarity and structural similarity to describe the complementary redundant relationship between video frames.

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Dynamic Fusion of Social Network Simulation Algorithms in College Education System

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Abstract:According to the user's social relationship, the joint distribution model of time and location of social network user nodes is constructed, and the cross-adaptive learning method is used to mine social network user preference information and detect related features. and its deep influence on the survival and development of people and the construction of social relations in the Internet age; based on the correlative theory of communitarianism. This paper proposes an innovation system for ideological and political education in colleges and universities from the perspective of big data, and further adopts the method of structured system analysis. From the perspective of big data, the network education system of colleges and universities has carried out in-depth research on layer-by-layer decomposition.

Keywords: Dynamic Fusion, Social Network Simulation Algorithms, College Education System

1. INTRODUCTION

With the development of network information technology, people's space-time distance in cyberspace is shrinking [1]. People can make friends, chat and share information through various social networks. In the networking design and operation management of social networks [2]. Research topics, the key is to grasp the hot spots and focus on the frontier. "Hot frontiers are key issues in the development of ideological and political education theory and practice [3], focusing on the discussion of the theoretical difficulties of the discipline and the exploration of emerging things, which contain many issues worthy of exploration and discussion [4].

At present, the research of social network in China is still in its infancy, and more is to analyze and study its market value from the perspective of network communication and marketing [5], use social network in education, especially in college students to use social network to carry out ideology and politics There is relatively little theoretical research and practice in education [6]. Some scholars also believe that it is necessary to explore the use of mobile community concepts or network community thinking to promote ideological and political work, and to conduct in-depth research and use of Internet mobile community [7] rules to realize the education method from the traditional top-down "object-shaping" to an equal and interactive one. The transformation of "subject participation" [8].

There are many types of new media, mainly including information websites, search engines, online communities, etc.; new entertainment media such as online games [9], digital video, and webcasting; new social media such as QQ, Weibo, and WeChat; new life such as online shopping and electronic payment Service media [10]. In 2006, Germany began to make all official German information databases on toxic and hazardous substances and German climate change forecast maps freely available to the public. In addition to the above major countries, South Korea, Australia [11], Singapore, India, etc. have all implemented their own national big data development strategies and carried out certain big data actions. The focus of this paper is to clearly clarify the frame structure and constituent elements [12] of the network ideological and political education platform in colleges and universities, accurately judge the development status of the network ideological and political education platform [13] in

colleges and universities, and propose strategies for optimizing the network ideological and political education platform in view of the actual problems [14].

As Manuel Castell pointed out: "Whether society can master technology, especially the strategically decisive technology in each historical period [15], has shaped the fate of society to a considerable extent."11 When we make full use of Internet technology at times, ideological and political education is more of an opportunity than [16] a challenge. Paying attention to method practice is a tradition that ancient my country insisted on. In ancient my country, the method and practice of data were very rich [17]. First, the method and practice of data in ancient my country is first reflected in the operation of data, which mainly involves arithmetic, system and calculation of numbers [18]. At present, the definition of "virtual knowledge community" in academic circles is still incomplete, and usually it appears in the form of "academic forum" and "online learning community" [19].

Wang Dong (2010) believes that virtual knowledge communities are more professional and knowledgeable than ordinary virtual communities [20] in terms of communication objects and content. Combined with the group intelligence analysis of social network, the adaptive optimization control method is used to realize the intelligent recommendation design of social network [21]. At present, the typical algorithm mainly includes the fuzzy grid recommendation method. In human Internet practice, with the Internet practice activities with the increasing integration of life, with the increasing popularity of the Internet knowledge system, the Internet spirit of "openness, equality [22], cooperation, speed, and sharing" has become more and more popular, subtly adjusting and changing people's thinking in the Internet age. The interaction of social networks [23], Openness and quickness are affecting the formation of new values of college students. The social network breaks the class consciousness of the traditional network, and helps college students to establish an equal and free communication platform through equal interaction and communication [24]. People in cyberspace also want to fulfill higher-level needs such as love and belonging, respect and self-actualization. The "virtuality" of the network virtual society corresponds to the "reality" [25] of the human real society, and it mainly points to the difference between the cyberspace constructed by computers and the

Internet compared with the tangible and visible physical environment of people's daily life. Visibility and the absence of the human body [26].

2. THE PROPOSED METHODOLOGY

2.1 The Social Network Simulation Algorithms

To explore the process of my country's historical development, it has gone through stages such as body-speaking communication - symbolism - handwriting communication. With the invention and creation of printing technology, printing communication greatly improved the communication efficiency of ancient people. In the traditional Chinese concept, the core work of ideological and political educators in colleges and universities is teaching. Coupled with the long-term influence of past empiricism, the educational concept of "emphasizing management and neglecting service; emphasising education and neglecting self-education" has emerged. Concept still occupies an important place in the current ideological and political education in colleges and universities. Cognitive level is one of the subjective factors that affect the formation of people's thoughts, that is, people's ability to obtain information, judge and evaluate information and apply information.

Today, with the popularization and application of computer network technology, the learning methods, educational methods and educational channels of the educated have changed. Rapid iteration is a prominent feature of Internet technology development. The Web is the most important information application technology platform on the Internet, and the technology upgrade has gone through 1.0-2. □ 0-3.0 three stages. Webl. The essence of O is a digital, multi-media composite hypertext information medium, which is shared and interactive. This statement vividly compares a large number of observation methods to be a correct and effective method to explore the regularity of social phenomena.

Francncis Galton once measured and calculated ability and virtue, and proposed the correlation and regression of the two variables for the first time. The value orientation and value pursuit of ideological and political education. The new environment and new characteristics of the Internet era require that the value concept of network ideological and political education in colleges and universities should pay more attention to the main body of students in adhering to the leadership of teachers. With powerful functions of information release and transmission, social networks meet the needs of ideological and political education and have unique advantages. You can easily reprint or publish all kinds of information ranging from national policies to people's lives without needing a long discussion. As the results of this questionnaire survey show, young college students currently studying at school have a high degree of concern for the online community.

2.2 The Dynamic Integration of Higher Education System

The main driving factor of the degree of dependence and dependence is that the online community can meet its diverse needs to a large extent, such as acquiring massive and diverse information, expanding online communication, especially group communication.

The impact of the new media era on ideological and political education in colleges and universities is also reflected in the teaching methods. The traditional indoctrination education model has become difficult to do in the new media era. The concepts and cognitions of college students are no longer limited to the knowledge content in books and the complicated media. In this open and shared educational environment shaped by big data, the education of ideological and political education in colleges and universities can easily lead to students' dissatisfaction. Disgust, which forces colleges and universities to transform other education-oriented education into education that combines other education and self-education. Colleges and universities should not only allow students to obtain knowledge in the university. We only need to focus on analyzing the elements of the network ideological and political education platform. Hierarchical structure, and then go deep into the functions of different elements presented by the interaction of various elements of the online ideological and political education platform, reveal and grasp the integrity of the online ideological and political education platform, and optimize and maximize the overall effect of the online ideological and political education platform. change.

The former is a broad understanding of network ideological and political education, and the question raised is how to develop traditional ideological and political education from concept to content, means, mechanism and organization in the networked social environment, which is the construction of a comprehensive system of ideological and political education. question. The latter is a narrow understanding of network ideological and political education. An intelligent group algorithm is established in conjunction with social activities to carry out the integrated recommendation design of social networks, and the recommendation information is projected into the high-dimensional phase space F for feature reorganization and information fusion processing to improve user information. The ability of automatic matching and identification of network information. Social networks are deeply loved by college students for their openness, convenience and interactivity, and have penetrated into all aspects of college life.

2.3 The Dynamic Integration of College Education System Based on Social Network Simulation Algorithm

By building a communication platform through social networks, educators and college students have shortened the distance, and in the process of ideological and political education, the interaction between teachers and students has been improved. What's more, it will also bring a sense of information indifference and information silence, that is, choosing to refuse to click and read "unread" information in the group. For some information producers, in order to be able to "stand out" from the massive information, avoid missing valuable information. The difference between big data and previous data processing technologies is that the overall sample replaces the partial sample. If ideological and political educators want to gain insight into a student's ideological and behavioral tendencies, they must comprehensively collect some data related to college students as much as possible. In the Internet environment, the enrichment of information resources, the diversification of information dissemination channels, and the speed of information dissemination have greatly reduced the difficulty of obtaining information for college students. Schools and teachers are no longer the only way for them to obtain information. College students can Obtain a large amount of information from many network channels. First, we must strengthen administrative leadership and work force building.

Since Yiban has been elevated to a national strategy, a national-level ideological and political work leading group should be established to plan and guide online ideological and political work, including coordinating and promoting the national co-construction of Yiban, formulating annual work plans, formulating co-construction standards and assessment mechanisms, etc. In the era of big data permeating every industry and business field today, all fields attach great importance to tapping the potential of data. This has led to a new development of data-based educational decision-making, and has gradually demonstrated its development potential and advantages in the upsurge of educational informatization. In this way, using linked data as the basis of the recommendation system can fully mine user needs, fully mine the information contained in knowledge, and fully express user needs, solve the problem of cold start and matrix sparsity, and enhance the knowledge recommendation ability of the recommendation system.

3. CONCLUSIONS

Combined with the group intelligence analysis of social network, the adaptive optimization control method is adopted to realize the intelligent recommendation design of social network. This paper proposes a cross-layer fusion intelligent recommendation algorithm for social networks based on fuzzy spatiotemporal information perception. The network ideological and political education platform in colleges and universities is an important position for the network ideological and political education in colleges and universities, and its quality directly affects the effect of the network ideological and political education in colleges and universities. This is the basis for providing personalized knowledge services for virtual knowledge community users. The evaluation system of personalized knowledge recommendation effect in virtual knowledge community is constructed.

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The Impact of Technology Change in Work, Employment and HRM

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Abstract:Rapid technological change has had a huge impact on transforming employment, work, and human resource management. Technological innovations have led to the rise of automation and new types of work. HR practices are undergoing a transformation towards remote working, algorithmic decision-making, and so on. However, the integration of technology into organisational production inevitably creates challenges in terms of inequality and ethical concerns. To address these challenges, the article offers a series of practical recommendations for possible interventions by HR departments.

Keywords: HRM, technology change, work, employment

1. INTRODUCTION

The rapid advancement of modern technology has significantly altered the nature of work, employment practices, and human resource management (Omar, 2021). Rapid technological change has created a new break in automation, artificial intelligence (AI), machine learning, and digitization (Dwivedi et al., 2021), which are altering the way organizations operate and the nature of jobs. This article will critically review the influence of technology development on work and employment along with HRM practice, examine the accompanying challenges and opportunities, and provide efficient strategies.

2. TECHNOLOGICAL TRANSFORMATION OF WORK AND EMPLOYMENT

The rapid advancement of technology has resulted in significant changes in the job market and employment scene. This transformation is visible in three important areas: automation and job replacement; remote work and digital connectivity; and the gig economy and platform work.

Firstly, the automation and job displacement. With the rapid development of technology, the automation of daily tasks is achieved through the use of artificial intelligence (AI), robotics, and machine learning. Automation has replaced tasks that were traditionally manual and time-consuming. Although this has enhanced efficiency and output (Agrawal et al., 2019), it has also generated worries about job displacement and a shift in the sorts of skills required of the workforce (Autor, 2015). Autor (2015) also stated that technological developments polarize the job market, enabling either high-skill, high-wage employment or low-skill, low-wage jobs while decreasing the number of middle-skill jobs. According to the Mena Report (2016), automation and machine learning could replace at least 5% of manufacturing, technology, sales, and marketing workers over the next three years.

Secondly, the remote work and digital connectivity. The development of technology has drastically changed the traditional corporate job model, and digital networking tools have made remote work a reality. Because of the broad usage of digital communication tools, collaboration software, and cloud platforms, enterprises have been able to quickly accept and utilize remote working, a trend that has been pushed in particular by the advent of the COVID-19 pandemic. Remote work has a positive impact on improving employee job satisfaction and well-being. Remote employment has been shown to improve employees job satisfaction and well-being. As it relieves knowledge workers of workplace distractions and commutes, allowing employees to manage their schedules more flexibly (Delanoeije et al., 2019) and focus on particular tasks (Kelliher & Anderson, 2009). However, because of the less independent collaborative duties, remote work might cause technical stress and job unhappiness (Suh & Lee, 2017). Furthermore, feelings of alienation, loneliness, and fear caused by physical distance will have a detrimental impact on employee productivity (Collins, 2005).

Finally, digital platforms contributed to the emergence of the gig economy (Graham et al., 2017), a model that cuts labor costs by classifying workers as "independent contractors" and therefore avoiding employment-related liabilities such as insurance and paid time off (Josserand & Kaine, 2019). More freelance employment is available in the gig economy, offering workers more autonomy and flexibility (Kaine & Josserand, 2019). However, because of its high flexibility, the gig economy has prompted worries about the lack of typical work benefits such as health insurance, retirement plans, and job security (Wood et al., 2018).

3. TRANSFORMATION OF HUMAN RESOURCE MANAGEMENT

The development and proliferation of digital technologies have had an inevitable impact on the digital transformation of the workplace. This transformation is particularly pronounced in the areas of recruitment and talent acquisition, as well as employee training and development.

Firstly, digital transformation has enabled online platforms and AI-driven algorithms to be increasingly used to search for and screen candidates, thereby streamlining the recruitment process. Firms implementing algorithmic decision-making can achieve cost and time savings, minimise risk, increase productivity, and increase decision-making certainty (McDonald et al., 2017). In addition to these economic reasons, organisations seek to reduce human bias (e.g., prejudice and personal beliefs) through the application of algorithmic decision-making, thereby increasing the objectivity, consistency, and fairness of the HR recruitment process (Langer et al., 2019). However, relying solely on algorithms to complete recruitment decisions may carry the

risk of bias and unfairness (Lindebaum et al., 2020). Algorithms can produce discriminatory or biased results if they accept inaccurate, biased, or unrepresentative input data. Thus, if algorithms have biased input data, they are prone to produce or replicate biased decisions (Köchling & Wehner, 2020).

Secondly, employee training and development. With the rapid development of technology, companies are turning their attention to upgrading the skills of their employees in order to remain competitive in the digital transformation process. The automation of routine tasks is threatening traditional workflows by gradually replacing some traditional work tasks through the use of technologies such as artificial intelligence and robotics, forcing many traditional workflows and tasks to undergo fundamental changes (Agrawal et al., 2019). In the face of this change, employee mastery of new technologies, tools, and software is particularly important to remain competitive in dealing with a fast-changing environment. This requires continuous learning to ensure that employees are able to embrace and adapt to new technologies and ways of working. Research suggests that training will be a key strategy for organisations to meet the demand for the necessary knowledge and technical skills by providing training to employees (Aguinis & Kraiger, 2009). During the training process, the HR department is responsible for connecting the direction of employee training with the organization's required skills. To improve the efficiency of training, organizations can offer remote delivery. Technologies like virtual reality and augmented reality can be used to simulate real-world workplace scenarios, which not only improves the interactivity of the training but also strengthens employees' hands-on skills (Zhao et al., 2005).

4. CHALLENGES AND EFFICIENT STRATEGIES

While digital change has facilitated workplace employment, it has also created a range of challenges and implications for human resource management. The main concerns are in the areas of inequality and ethical concerns.

Inequality and digital divide

Although technological breakthroughs have enhanced productivity, they have also increased job inequality and the digital divide. This problem is exemplified by the digital divide, which is produced by variations in individual access to digital technology (DiMaggio et al., 2003), and it has the potential to worsen already existing socioeconomic disparities. As a result, it is critical to identify strategies to involve and equally expose everyone to all stages of technological advancement. A multitude of factors, including cultural background, economic status, and educational level, might contribute to the digital divide across groups (Van Dijk & Hacker, 2003). Specific groups of individuals have been identified as being particularly disadvantaged in terms of ICT uptake, including those with poor incomes, those with low education or literacy levels, the elderly, and those living in distant or rural locations (Cullen, 2001). They are frequently already disadvantaged in terms of education, finances, and health status, and the substantial cultural disparities between developed and developing regions result in low rates of exposure to and acceptance of new technology (Cullen, 2001). The exclusion of these groups from the process of technological change due to a lack of appropriate technological training and opportunities for its use not only places limitations on their competitiveness in the labour market, but also restricts their scope for economic and social advancement, thereby increasing socio-economic disparities between groups.

In order to narrow the digital divide and increase equity. HRM professionals could provide more equal training opportunities to help employees learn and master digital technologies. In addition, organisations can increase the effectiveness of training by offering employees inclusive support resources and targeted assistance to disadvantaged groups of employees to meet the needs of employees from different culturally proficient backgrounds. Moreover, social and governmental institutions can increase the inclusiveness of digital technologies to ensure that everyone has access to education. Specific measures can be taken to reduce the digital divide by providing quality education on digital technologies and encouraging enterprises to actively participate in social awareness programs on digital technologies.

Ethical concerns

While using AI and automation to improve the efficiency of decision-making, people have overlooked their potential ethical issues. This includes issues of algorithmic bias and data privacy (Hagendorff, 2020).

First, algorithmic bias. It is believed that human decision-making is usually considered subjective and biased, whereas the use of algorithms increases the objectivity of decision-making (Pessach & Shmueli, 2023). However, the introduction of algorithms does not help one address this problem because the predictive model may actually be inherently biased as it learns and retains historical biases (Kleinberg et al., 2017). As a prominent example of the current debate around bias and fairness in algorithmic decision-making, the hiring algorithm applied by Amazon resulted in an extreme disadvantage for female applicants, which ultimately led to Amazon shutting down the full algorithmic decision-making for hiring decisions (Dastin, 2022). In addition to this, the perceived fairness of the algorithmic decisions made by job applicants during the recruitment and training process will affect their performance in accepting the job offer as well as later on in the workplace. It has been shown that employees who feel that they have been treated fairly are more likely to exhibit dutiful behavior and altruism (Cohen-Charash & Spector, 2001). Conversely, candidates who feel unfairly treated may damage the employer's image, for example, by posting unfavourable comments about the employer's company on social media platforms.

To reduce unfairness in the algorithmic decision-making process and enhance the candidate experience during the application and training process. HR departments can reduce the risk of input data bias by increasing data diversity. Besides, regular evaluation and testing of algorithms should be increased, as discriminatory results from algorithmic decision-making are only detected after the decision has been made. Therefore, regular monitoring is beneficial for detecting potential biases and enabling timely corrections. In addition, multi-perspective evaluations can help detect possible biases. The fairness of algorithms can be assessed from multiple perspectives, and timely adjustments can be made by selecting people from different backgrounds to participate in the development and testing phases of the algorithms.

Secondly, the data privacy. The promise offered by data analytics to monitor employee behaviour and performance in

the workplace is increasingly appealing to companies, sometimes even extending to non-work-related behaviours. COVID-19 has even accelerated the process of data monitoring of employee behaviours, such as monitoring the social distance of factory and warehouse workers (Vincent, 2020). However, some of the big data analyses in human resource management seriously affect employee privacy and can lead to privacy breaches and infringements (Nguyen, 2019). The right to privacy underpins and is closely related to other fundamental rights at work and beyond, such as freedom of association and expression. Excessive monitoring and involving employees' privacy will have a negative impact on employees' job satisfaction. This is because, according to Maslow's theory of needs, the third level of an employee's needs is threatened, which is the sense of belonging, and due to excessive monitoring of the employee's privacy by the organisation the employee's privacy is compromised, which in turn affects the employee's commitment to the organisation (Mcleod, 2023).

To ensure that employees' privacy is respected, HR departments need to follow the laws and regulations that apply to employee data privacy, such as the European General Data Protection Regulation (GDPR). In addition, the HR department can provide clear notification to employees before data collection and give employees the right to refuse data collection. In addition, organisations should inform employees of the purpose and use of data collection in a timely manner and seek their consent before collecting data. Finally, for data retention, HR departments should put in place secure storage measures such as data encryption and access control to avoid the risk of unauthorised access, leakage, and misuse.

5. CONCLUSIONS

Rapid technological change has had a huge impact on transforming employment, work, and human resource management. Technological innovations have led to the rise of automation and new types of work. HR practices are undergoing a transformation towards remote working, algorithmic decision-making, and so on. However, the integration of technology into organisational production inevitably creates challenges in terms of inequality and ethical concerns. To address these challenges, the article offers a series of practical recommendations for possible interventions by HR departments.

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Metaverse New Media Digital Twin Assists the Construction of College Students' Educational Intelligence Platform

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Abstract:With the help of metaverse technology, the new media industry will undergo profound changes, and immersive media will become a new direction for the development of the new media industry, which will generate innovative reporting scenarios. The theoretical and technical foundations of learner portrait construction are expounded. And according to the data fields of the smart classroom learning platform and the characteristics of primary school science classrooms, a model for primary and secondary school science learners in the smart classroom is designed, and the students are determined around the "basic attribute characteristics-psychological attribute characteristics - behavior attribute characteristics - ability attribute characteristics. The five feature dimensions of "result attribute characteristics" are used to profile learners. Using big data mining technology and integrating artificial intelligence technology, the integration of multi-source information data is realized, and a five-dimensional digital twin system is constructed.

Keywords: Metaverse New Media, Digital Twin, College Students, Educational Intelligence Platform

1. INTRODUCTION

On October 29, 2021, Mark Elliot Zuckerberg announced at the FacebookConnect developer conference that the company name was changed to "Meta", and the stock code was changed from "FB" to "MVRS" from December 1, 2021 [1], indicating that it will transform into a "Metaverse" company in the next five years. However, the current power generation enterprise system architecture and information system construction are difficult to meet the needs of intelligent construction, and the system architecture and intelligent system construction of smart power plants have become urgent problems to be solved [2].

The fifth chapter of the "14th Five-Year Plan", "Accelerating Digital Development and Building a Digital China" proposes: In order to meet the digital age and activate the potential of data elements, it is necessary to promote the construction of a network power country and accelerate the digital economy with a production method driven by digital transformation as a whole [3]. A series of problems such as low data utilization, difficult data fusion, and incomplete data mining caused by different data formats, data types, and data storage methods bring inconvenience to the integrated control, overall management, and maintenance decisions of the platform [4].

The history of journalism shows that updates in media technology often have a crucial impact on international communication. However, in the face of the new technological conception of the Metaverse [5], some scholars believe that it is a "new-style utopia", a digital phantom of "drawing water from a bamboo basket". It is an opportunity to enhance the communication effect of mainstream media and accelerate the promotion of digital industrialization. It is also a challenge [6].

The purpose of this paper is to interpret the meaning of the metaverse from a triple perspective, and to expound the construction of a new multi-dimensional and cross-dimensional information dissemination pattern for the socialization of the human metaverse, thereby changing the passive position of mainstream media in industry competition [7]. Digital development builds digital China", giving full

play to the advantages of massive data and rich application scenarios, giving birth to new industries, new formats and new models, and for the first time listing "virtual reality and augmented reality" as one of the key industries in the digital economy [8].

1] With the further development of the Internet, the next blue ocean of the digital information technology revolution is about to emerge. The literature of core journals can represent the highest level of research in this field. Therefore, in this study, CSSCI journals in the field of educational technology are mainly selected for the retrieval analysis of "Smart Classroom" [9], namely "Modern Educational Technology", "China Electronic Education", "Smart Classroom". "Electrical Education Research", "Distance Education Journal", "Open Education Research", the era of big data has come, and portrait is a term that is often mentioned in human-computer interaction. The earliest proposer [10], AlanCopper, defined "UserPersona" as "the virtual representative of real users". User portraits are used to connect real users and describe and describe various characteristic elements of real users in a visual way. "Modern Distance Education" Research" [11], "China Distance Education". Through the investigation, Professor Zhang Yi found that information attitude, electronic lesson preparation ability, network teaching and research ability, teacher-machine ratio, ability to use digital resources, information technology training content, and ability to use network communication will all have a greater impact [12].

On this basis, it puts forward suggestions for improving the application level of teachers' informatization. Many technology companies and social media, including GREE, have successively adopted various methods such as mergers and acquisitions, large-scale investment and registered trademarks to actively deploy the "Metaverse" [13]. There are various signs that 2021 has become the "Year of the Metaverse". , to guide or reduce part of human labor [14]. The essence of the Industrial Internet is to collect the data of industrial objects through digital twin technology, through the interconnection of industrial objects, and establish an industrial data analysis model for specific business needs [15].

As an intensive and compact urban development model, urban underground space includes underground transportation, commercial facilities, warehousing and logistics, municipal pipelines, underground garages and other fields [16]. The cyber-physical system CPS is a multi-dimensional complex system that integrates computing, network and physical environment. The advantages of reliability, safety, efficiency, and real-time collaboration have attracted widespread attention in various industries. As a new technology in the field of cyber-physical system fusion, digital twin [17].

2. THE PROPOSED METHODOLOGY

2.1 The Metaverse New Media

The Metaverse originated in science fiction. In 1992, science fiction writer Neil Stephenson first proposed the concept of Metaverse in the novel "Avalanche". On January 18, 2022, Microsoft Corporation announced that it is acquiring Activision Blizzard in an all-cash transaction valued at $68.7 billion, the largest deal ever in the gaming industry.

Microsoft is working on building an "enterprise metaverse," Chief Executive Satya Nadella said, noting that a metaverse where Microsoft's cloud computing service (Microsoft Azure) "shines into reality" is reaping the benefits At the same time of high attention, it has also triggered academic debates and theoretical assumptions about its concept, core, representation, content, technology and many other elements in academia and industry. Some scholars place the metaverse in the field of media studies, and continue McLuhan's assertion that "media is an extension of human beings", which is constructed by the interaction of human beings with other people's "digital embodiment" and system "virtual human" in multi-dimensional and cross-dimensional space. The audio-visual environment will become an important source of diversity and diversification in the "metaverse" multi-dimensional digital virtual space, and professional media organizations are organized. In 2018, Spielberg's sci-fi film "Ready Player One" is considered to be the most in line with the metaverse form. .

After the hero in the movie puts on the VR helmet, he instantly enters an extremely realistic virtual game world - "Oasis". Professor Yu Guoming believes that the Metaverse is the ultimate digital medium that integrates and integrates all digital technologies of the present and the future. It will connect the real world and the virtual world to form a future ecological picture of a mediated society. In addition to the above assertions, various theoretical concepts such as game theory, economic theory, and efficiency theory have been successively proposed for the metaverse from different perspectives and based on different theories. As time progresses, new concepts emerge in an endless stream, fully reflecting the dynamic vitality and infinite potential of the metaverse as a new thing. The formation of the "metaverse" multi-dimensional and cross-dimensional audio-visual communication ecology will break the existing new media audio-visual communication pattern, trigger the decline and disappearance of the control power of traditional social organizational units, and lead to the handover and reshuffle of old and new dominant forces.

2.2 The Construction of Intelligent Platform for College Students' Education

With the support of modern information technology and the development of relevant learning analysis theories, precision teaching has been given new vitality. Zhu Zhiting et al. proposed a breakthrough from the early precision classroom teaching based on the behaviorist learning theory that only focuses on the learning results to the accurate classroom teaching mode that focuses on the learners themselves with the support of information technology.

Digital twin refers to constructing digital objects corresponding to physical entities in the real world through digital means, and realizing the understanding, analysis and optimization design and integration of the corresponding physical entities through the research of digital objects. As a necessary part of teaching, kindergarten teachers need to design information-based teaching and plan how to integrate technology into teaching. The design and fusion dimension is composed of 7 factors, and the survey statistics are as follows in Table 3-9: Quantitative methods are used to combine multiple characteristic elements under each dimension. In this study, descriptive statistical analysis and quantification of cluster analysis are used. Methods The data were analyzed and processed, and the basic attribute dimension, learning style dimension, behavior attribute dimension, and inquiry ability dimension of learners were analyzed.

In contrast, colleges and universities have adopted a variety of methods to promote the generation of smart classrooms, such as the use of smart learning platforms such as Chaoxing Fanya Learning Platform and Rain Classroom, which have greatly improved classroom efficiency. However, smart classrooms in primary and secondary schools are often limited to smart classrooms. This equipment problem that cannot be solved in a short time has become an obstacle for primary and secondary schools to explore smart classroom teaching. Select the number of class notes recorded, the number of rush answers, the number of votes, the number of classroom test submissions, and the number of experimental operations within a month, and the K-means clustering method in SPSS19.0 software is used to model the deep-level behavioral attributes of learners. . Take visit statistics, check-in, number of group task participation, number of rush answers, and number of responses in discussion forums as independent variables, and test scores as dependent variables for stepwise regression analysis. After the model is automatically identified, the remaining visit statistics and the number of rush answers are a total of 2 items in the model.

3. CONCLUSIONS

Thinking from the development of the media itself and the steady development of the Metaverse, we will gather more technology enthusiasts and future experiencers to learn the application of advanced technology in the media, and give full play to the role of the main force of the media. The application analysis of life cycle management shows that digital twin technology can better simulate, monitor, diagnose, predict and control the formation process and behavior of power plants in the real environment. Focus on seeking the current rapid popularization of smart classroom construction models in most universities Therefore, the Chaoxing Fanya platform is used for teaching, paying attention to the dynamic learning data generated by it, and establishing an analysis model to study the teaching effect.

4. ACKNOWLEDGEMENT

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Intervention Paths and Strategies for Psychological Crisis of Higher Vocational College Students in the New Media Era

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Abstract: The research on early warning and intervention of college students' psychological crisis has become an important issue of concern to the country, society, universities, and college students themselves. Compared to timely intervention and handling of crisis events, it is more important for universities to establish a comprehensive and systematic crisis warning and intervention system. Based on the characteristics of the new media era and the theory of psychological crisis warning and intervention, universities should strengthen the training of student education managers on the use of new media and network information mining technology and make new media an important platform for psychological crisis warning and intervention of college students in the new era.

Keywords: Intervention Paths, Psychological Crisis, New Media Era

1. INTRODUCTION

The college stage is a critical psychological period for individuals to develop from adolescence to adulthood. When faced with complex life issues, their unstable psychological state and lack of problem-solving ability make college students prone to psychological crisis. If they do not receive timely and effective intervention, it can easily lead to serious consequences.

In 2016, the mobile internet accelerated the integration process of traditional media and new media, and central and local media actively utilized the "two micro and one end" to transform into new media. The new media era, mainly manifested in the forms of blogs, Weibo, QQ, WeChat, and live streaming, has already or is affecting the values and psychological conditions of college students. According to the 38th "Statistical Report on the Development of China's Internet" (referred to as the "Report") released by the China Internet Network Information Center (CNNIC), as of June 2016, China's instant messaging users reached 642 million, with WeChat Moments, QQ Space the usage rates of Weibo are 78.7%, 67.4%, and 34.0%, respectively. Currently, a new media model centered on individuals has gradually formed, and it is urgent to build a psychological crisis warning and intervention system for college students in the new media era.

With the popularization of the Internet, "online loan consumption" has gradually penetrated major universities. College students feel very novel about this new type of internet finance, and some have developed a variety of mentality such as comparing, showing off, enjoying themselves, and being ahead. Many e-commerce online lending platforms have identified their unique consumption concepts and are offering online loans to college students. Online loans not only have a small amount of funds, but also have very simple procedures to handle. These advantages are highly sought after by college students, who have become the main group of online loan consumers. Many e-commerce online loan platforms induce students to apply for loans through mobile apps on online loan platforms and loan companies, with loan amounts ranging from thousands to tens of thousands of yuan. Some students cannot resist the temptation and go astray.

At the same time as online loans, college students also bear enormous psychological pressure, feeling anxious every day.

If they cannot repay on time, the online loan platform will contact their families, and students are worried about being blamed by their families. Under such psychological pressure, it will seriously affect their normal learning and life. The impact of new media on the mental health of college students mainly has five aspects. One is the impact of new media on the personality of college students. The positive impact lies in the fact that new media encourages individuals to express themselves freely, which is conducive to the strengthening of individual consciousness, the development of personality, and the establishment of "self-identity" among college students. The adverse impact is that new media is prone to group polarization and group anomie, manifested as college students being one online and another in real life, causing personality fragmentation. The second is the impact of new media on interpersonal relationships among college students.

2. THE PROPOSED METHODOLOGY

2.1 Determination of Early Warning Indicators for Psychological Crisis of College Students

The positive impact is that the anonymity of new media is beneficial for introverted and shy individuals to find trusted friends in the online space, eliminate loneliness in real life, and promote mental health. The impact of development space on the employment quality of college students shows a significant positive correlation. The larger the development space, the higher the job satisfaction of college students, especially those who have prepared employment plans. When seeking a job, they value their future career development space more, do not pay much attention to the starting salary, and have some psychological preparation for the difficulty of the job. Therefore, students who pay more attention to development space when seeking a job have relatively higher job satisfaction. There is also a positive correlation between interests, majors, and job satisfaction among college students. Most college students can find jobs that match their interests and hobbies, and their job satisfaction is relatively high.

Professional matching reduces the employment threshold for college students and provides them with greater development space for their future career development. Therefore, college students who find professional matching jobs also have higher job satisfaction. Individual information indicators refer to

individual characteristics that can influence or predict the development of crisis situations, including personality traits, physiological symptom indicators, cognitive indicators, emotional indicators, and behavioral indicators. Personality traits refer to the relatively stable internal psychological characteristics formed by individuals during their growth experiences; Physiological symptom indicators refer to the physical reactions that an individual experiences during a certain period, especially when facing stress events. Cognitive indicators refer to the reactions that an individual experiences during the process of acquiring and applying knowledge when facing stress events, such as sensation, perception, memory, thinking, language, attribution, etc.

Emotional indicators refer to an individual's emotional experience, emotional behavior, and emotional arousal towards stressful events; Behavioral indicators refer to a response system composed of a series of reaction actions that an individual produces when responding to stress events, which are manifested in various aspects such as learning, life, and interpersonal relationships. The second key step in warning college students of psychological crisis is to clarify the warning objectives. The Opinions of the Ministry of Education, the Ministry of Health, and the central committee of the communist youth league on further strengthening and improving psychological health education for college Students clearly state that efforts should be made to build and improve a warning mechanism for high-risk groups of college students with psychological problems. Therefore, conducting research on the early warning and intervention of psychological crisis among college students in the context of new media is a central topic that educators need to consider and explore.

In real life, individuals establish good interpersonal relationships through varying degrees of self-disclosure to meet their needs for integration into society. The group of college students in adolescence is even more so. According to social information processing theory and clue reduction theory, individuals engage in interactions on new media, due to a lack of body language, and need to provide more information to establish interpersonal trust. Therefore, college students will reveal more personal information on new media platforms.

College psychological counseling centers, departments, and classes can all participate in publicity work, establish themed education windows, cultivate students' correct value orientations, promptly and quickly detect abnormal situations, implement interventions, and help students alleviate complex emotions. To do a good job in ideological and political work for college students, it is necessary to adapt to the situation, advance according to the times, and innovate according to the situation. Universities need to further leverage the positive role of new media in the early warning of psychological crises among college students. One is to increase the training of new media technology for university student education managers. Student education managers in universities may use new media, but they are not familiar with many of its functions, making it difficult to deeply integrate new media with student education management.

Universities can organize specialized training on the use of new media platforms such as WeChat, QQ, and Weibo in student education management. Universities should strengthen career planning education for college students, starting from their first year to their fourth year, from academic career planning to career planning. Through career planning education, students should broaden their employment perspectives and help them establish diverse employment

perspectives. In response to the phenomenon of college students gathering in government agencies and state-owned enterprises to seek employment, universities should provide education on the employment perspective of college students and help them establish a diverse employment perspective. By conducting social practice activities, students can have the opportunity to practice and learn at grassroots work positions, helping them establish a correct understanding of grassroots work. We can also expand students' employment channels, provide opportunities for independent entrepreneurship, and improve their job satisfaction through methods such as crowdsourcing spaces, small and micro enterprise incubation parks, and school enterprise cooperation in education.

2.2 The Early Warning and Intervention System for Psychological Crisis of College Students in the New Media Era

The anonymity of cyberspace can also reduce individuals' self-awareness and increase their identification with the online environment, resulting in more and more self-disclosure in cyberspace than in real life. Although the longer the job search time and cost, the more job opportunities there are, the relatively lower the job satisfaction of college students. The higher the cost that college students spend on the job search process, the higher their expectations for the job. If the job they find is not satisfactory, their job satisfaction will greatly decrease.

The impact of workplace on the employment quality of college students is becoming smaller and smaller, because with the gradual deepening of reform and opening, the degree of urban modernization in first tier and second tier cities is gradually shrinking. College students are becoming more rational when choosing workplace, and many students choose workplace based on their actual situation, no longer flocking to Beijing, Shanghai, and Guangzhou. Set up hierarchical network information screening personnel to effectively observe, screen, and summarize based on warning indicators.

In universities, network information screening personnel are set up level by level according to dormitories, classes, majors, grades, and departments. Dormitory and class information screening personnel can be held by students, and information screening personnel for majors and above need to be held by psychological counselors or experienced teachers. The screening content of dormitory information screening personnel is the comments made by dormitory members on QQ space, chat, WeChat, Weibo, and other online media. The screening standard is an early warning indicator system. Once abnormal comments are found, they are reported to the class information screening personnel. The class information screening personnel then summarize and report the information within the class level to the professional information screening personnel, and so on, and report it level by level, The department level establishes a psychological crisis warning database based on information collection.

For students with special psychological problems, they can use mobile phone information, online email, and other methods to provide private psychological assistance and guidance to alleviate their anxiety and anxiety. Using new media to provide education and guidance through the following methods: Firstly, the school has established counselor Weibo as an auxiliary classroom for college students' mental health education, analyzing and inspecting students' reading and response situations, and communicating with them online to form a one-to-many communication model. Secondly, establish an online psychological and

emotional care consultation hotline for one-on-one counseling. Third, play video clips about beautiful soul regularly on WeChat official account. Fourthly, full-time, and part-time psychological teachers conduct live broadcasts of psychological courses on Weibo, with a "bullet screen" where students can speak freely and actively utilize the advantages of the internet to carry out mental health education work.

3. CONCLUSION

In practical work, we have found that using new media for psychological crisis intervention requires more time and effort from the intervener and requires higher quality of the intervener. Colleges and universities need to implement the requirements of adapting ideological and political work to different situations, advancing with the times, and adapting to new circumstances. The quality of employment for college students is related to the reputation of universities and the future development of students. Colleges and universities should guide students to establish correct employment values, rationally view factors such as career compensation, career development space, job stability, and work location, help college students establish diverse employment values, and improve the quality of their employment.

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Modern Design Intelligent Training Assistance Platform based on Lingnan Architectural Image Generation Algorithm

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Abstract:Modern design intelligent training assistance platform based on the Lingnan architectural image generation algorithm is studied in the paper. In order to make the network better train unpaired image samples, this paper introduces a loss function composed of the same mapping loss term and perceptual loss term on the basis of the original loss function. Then, the novel style transfer algorithm is designed. We propose CycleGAN without training on paired datasets, and the network employs two general generators and two discriminators, respectively. Two generators are used to then convert between the two domains, and two discriminators are used to distinguish the true and false images in the two domains. Then, the designed model is implemented with the novel intelligent training assistance platform and consider the factor of the Lingnan issues. Through the experimental simulation, the performance is validated.

Keywords: Image generation; image processing; intelligent training; computer platform; architectural image mining

1. INTRODUCTION

Early non-parametric image style transfer is a method of then analyzing style images, drawing a physical model or a mathematical statistical model according to the style, and then synthesizing the texture of the transferred image to make it more in line with the established model [1, 2, 3].

This method requires the establishment of complex models, which has high theoretical requirements, and each style needs to be modeled separately, which is time-consuming and labor-intensive [4, 5, 6]. Compared with the deep learning methods, non-parametric image style transfer methods show more and more shortcomings. Image style transfer initially appeared as a research problem in the field of image processing. Before the rise of neural network, rendering images with different styles was a very difficult image task, which required both style learning and style rendering [7, 8, 9, 10].

It lacked the image representation of the explicit semantic information and could not separate images from styles. Hence, for the efficient analysis, we consider listed issues.

(1)Combining the content of one image with the style of another image jointly minimizes the feature reconstruction loss, which is also based on a trained convolutional network to extract features. Similar methods have been used for texture synthesis. Their method produces high-quality results but is then computationally expensive because each step of the optimization problem needs to be passed forward and backward through a pretrained network [11, 12, 13].

(2)Randomly select a moderately exposed normal image and load it into the trained model, respectively obtain a low-exposure image and a high-exposure image with HDR detail color, and synthesize the two with the original image into an HDR file; then through tone mapping, get the final image as the general image after HDR style transfer.

(3)The task that CycleGAN wants to accomplish is to transfer the image style in domain A to domain B. Two GANs are used. In order to achieve unpaired training of data, it is not only necessary to calculate the loss functions of two GANs. In the figure 1, the framework is defined [14-19].

Slow neural style transfer based on the image iteration defines two types of loss functions: content loss function and style loss function. Among them, the style loss function is the key to the neural style transfer, and is subdivided into the following two categories according to the different style loss functions: methods based on the statistical parameters and methods based on non-statistical parameters [20, 21]. Deep learning model is difficult to see the internal structure, but for convolutional neural network, it can see the internal feature representation in the form of visualization [22, 23].

Three common visualization methods are convolution kernel output visualization, convolution kernel visualization and heat map visualization. The visualization method can make it easier for the convolution kernel to feel the image and locate the position of the object in the image through the heat map. Accordingly, we will discuss the novel issues in the next sections considering different scenarios.

2. RELATED WORK

As the main form of the information received by human beings, visual information with digital images as the carrier accounts for 85%. The quality of the image may be degraded in the collection, transmission, and processing of digital images, which directly affects the quality of the information contained in the extracted images [24, 25, 26].

Effective image enhancement techniques have always been an important research topic in the field of computer vision. After the HDR image corresponding to the dynamic range of the actual scene is generated, since the equipment used for direct display of HDR image is not yet mature, it is necessary to obtain images that can be displayed by the general LDR equipment through HDR-LDR mapping. The premise of the effective implementation of HDR-LDR mapping is that the generated HDR image must be a real mapping of the scene, which requires the highest possible dynamic range, and the HDR image needs to have a linear relationship with the scene brightness. The generator should cheat the discriminator as much as possible. The two networks confront each other and constantly adjust the parameters. The ultimate purpose is to make the discriminator unable to judge whether the output

result of the generator is true or not. In short, the optimization process of discriminator and generator is a minimax problem, also known as zero sum game. However, the optimization of discriminator and generator can not be carried out at the same time, because the data involved in training is limited. If the discriminator is optimized first, there will be the over fitting phenomenon, resulting in the model can not converge.

3. THE PROPOSED METHODOLOGY

3.1 The Image Style Transfer Algorithm

The current mainstream neural style transfer algorithms can be divided into two categories according to the different image generation methods: (1) slow style transfer based on image iteration; (2) fast style transfer based on model iteration. Among them, the slow style transfer based on image iteration generates stylized images by performing pixel iteration on noisy images, and can be subdivided into methods based on statistical parameters and non-statistical parameters according to different stylization methods.

In the process of visualizing convolution kernel, low-level convolution check is interested in the general color and edge information of the target image, and the extracted features are simple detection points and lines. With the deepening of the level, the content becomes more and more abstract and also complex. The convolution layer perceives the object position in the image more accurately, and the extracted features are usually complex specific objects. Among them, Pix2Pix uses paired data as input, that is, one-to-one corresponding source domain style data and the target domain style data, uses the generator to transform the source domain data, and then uses the discriminator to discriminate between real target domain data and fake data. Pix2PixHD is a high-definition version of Pix2Pix, using a multi-layer pyramid to generate high-definition images defined as the figure 2 [27-29]. We designed a cycle-consistent adversarial network for the image style transfer. This is the first time that GAN has been applied to the field of image style transfer, and achieved very good results. Class problem, and CycleGAN's learning data is unsupervised, small in number, and does not require pairing.

3.2 The Modern Design Intelligent Training Assistance Platform with Image Analyziung Algorithms

A parallel vision frame structure that provides real and artificial image data with parallel images as the viewing angle. Firstly, the artificial image is used to expand and supplement the actual image, and the parallel image "big data" combining virtual and real is obtained. Then, various visual models are then learned and evaluated through computational experiments.

Finally, with the help of the parallel execution of online optimization of the visual model, the intelligent perception and understanding of the complex environment is realized. In the figure 4, the parallel model is defined.

When the SAGAN model is trained, the details can be generated using cues from all feature locations, that unlike traditional convolutional GANs that only generate the high-resolution details from spatially local points in low-resolution feature maps. The discriminator can also check for consistency of highly detailed features in the distal part of the image. The improvement of general information technology is the key to intelligent design. At this stage, although there are many types of software related to architectural design, there is the problem of difficult information interaction. At the same

time, some intelligent design software is reverse design, which wastes time and resources, and has no substantial effect on promoting the project. To solve the above problems, we must continue to enrich model plug-in tools based on the forward import of the architectural design, and further standardize digital interaction protocol standards, and achieve high integration and sharing of life cycle information of engineering projects such as design, construction, and operation. In the figure 5, the details of the considered model is demonstrated [30-31].

3.3 The Integration of the Lingnan Architectural Image Generation

The transition space of Lingnan modern architecture is the intermediary area where the inside and outside of the building are combined. It is open and transparent and highly integrated with the environment. These transition spaces have different numbers of effective enclosure interfaces, blurring the indoor and outdoor boundaries through general spatial organization connections such as sight lines and streamlines. The design methods of the transition space are various to provide users with a variety of space experiences. From the space type, it can be divided into the following three categories: "grey space", external extension space, and internal open space.

The overall design method is based on the second-generation design methodology, emphasizing the multi-party participation and overall coordination, and believes that the system is an organic whole composed of several elements with certain new functions. The overall design emphasizes that the design process is a dynamic, open, and progressive process, rather than a static, closed, and final result while paying attention to the ambiguity and diachronicity of the design, and its form and function can be adjusted with time and external conditions. The depth, breadth and integrity of the overall design are greatly expanded, and the dimensions of design objects, design subjects, design goals, design processes and also design mechanisms are also greatly enriched. The layout of traditional buildings in Lingnan has accumulated wisdom and experience in the use of low-tech buildings under the natural climate conditions, so that it can not only realize the building's moisture removal and heat dissipation, but also meet the building's shading and cooling. Its functions are interlinked. Each component complements each other, all of which are exerting their general excellent traditional Lingnan architectural culture.

The combination and restraint of the layout elements, as well as the importance of the cold alley in the layout thinking, formed the unique architectural layout thinking of Lingnan, which has survived to this day. Among them, ecological wisdom and ecological perception still have strong vitality for the adaptability of buildings to natural climate at this stage, which highlights the research value and significance of the Lingnan traditional architectural culture.

4. CONCLUSIONS

Modern design intelligent training assistance platform based on the Lingnan architectural image generation algorithm is the core aspect of the paper. From the comparison of experimental results, it can be found that under the same number of iterations, the method in this paper can achieve style transfer faster and achieve a more realistic style transfer effect. We integrate the DenseNet module in the converter as part of the CycleGAN generator, which reduces parameters, reduces computation, avoids overfitting, and improves image generation quality. In the future, we will apply the designed model into more real scenarios.

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AR-Based Clothing 3D Simulation Design Online Smart Curriculum System Design and Mobile Software Implementation

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Abstract:This article studies the computer-aided realization of the online smart classroom of clothing design and its mobile software from the perspective of big data. The application of AR in the production of three-dimensional clothing models is described, the current situation of computer-aided design in clothing design is analyzed, and some application strategies are proposed. Promote the innovative development of the apparel design industry. Combining the background of big data, this paper proposes an innovative clothing design strategy based on AR three-dimensional model. Starting from the various elements of clothing design and discovering fashion elements from the perspective of data mining, it can achieve the purpose of clothing design innovation to meet the ever-changing social needs.

Keywords: AR, 3D Simulation, Online Smart Curriculum, Mobile Software

1. INTRODUCTION

In the 21st century, with the development and promotion of computer networks, mobile Internet and other technologies, computer technology has been fully integrated with social production and life, and "data" has penetrated into all aspects of people's lives [1]. Information data continues to grow massively [2], and human society has entered the "big data era". Applying big data-related information technology theories to clothing design is a major trend for clothing companies to respond to the continuous changes in market consumer demand [3]. Innovating traditional clothing design thinking and brand management concepts, proposing and optimizing clothing [4] design models under big data, can guide clothing companies to avoid market risks, prevent blind product development [5], improve the company's ability to respond to emergencies in the market, and also help Broaden the development [6] direction of enterprises and improve their competitive advantages in the market. Compared with traditional clothing brands [7], apparel e-commerce brands have achieved more rapid development and grasped the needs of consumers in a timely and accurate manner. To a certain extent, this is due to the former's effective use of information technology related to big data [8].

How to calmly respond to the increasingly mature needs of consumers under various changes is becoming a new challenge to test the construction of a rapid response system for every apparel company [9]. Popularity means that a certain thing spreads widely in a certain area for a period of time and is quite popular. In modern social life [10], it can be said that nothing (except epidemic diseases) is more prominent than the popularity of clothing [11]. A certain color and a certain style will be popular in the entire region in a short time, and will be replaced by new models [12] and new colors in a short time. Its spread and update speed [13] is fast, and it involves a wide range of people [14]. It is other Things beyond reach. Therefore, it can be said that popularity has become one of the important characteristics [15] of clothing. With the progress of material civilization and the improvement of people's cultural literacy and aesthetic appeal [16], clothing, as a special product that can show personal status, cultivation, and personality, its popular characteristics [17] have become more

and more prominent, and it has also become a must for the prosperity and development of the clothing industry. condition. The popularity of clothing is not only [18] reflected in the fact that a certain style has changed from the dress of a few people to the dress of the majority, and it has become the most common dress in a certain area at a certain period [19], that is, the popularity of fashion; at the same time, it is also manifested in the replacement of new styles in terms of fashion changes. The old model, the new color [20] replaces the old color, the new and the old change, that is, the evolution of fashion. The popularity of clothing is firstly based on human physical and psychological factors [21].

This paper uses 3D character modeling to control the behavior of the model to improve the realistic and smooth effect of 3D virtual animation. Augmented reality [22] (Augmented. Reality, AR for short) is bringing changes to the world, even though it is currently only an emerging technology. A report issued by the investment bank [23] Digi-Capita in 2015 believes that the AR market in five years will reach 120 billion U.S. dollars, which will change the fields of games, variety shows, medical care, education [24], online shopping, sports events, military, news, etc. m. At present, MagicLeap is the world's most watched augmented reality company, with a valuation of at least US$4.5 billion. Google, Microsoft, Sony and other technology giants and investors are paying attention to the AR field. It is one of the research hotspots of many well-known technology companies, universities and research institutions at home and abroad in recent years. It represents the future of technology. Image cartoonization the third type of realization method is to use the material in the material library to match or replace the facial features of the face image to obtain the cartoon image.

In the clothing display, it must be combined and regularly changed by multiple design elements of the same group; the fashion trend in the clothing design process belongs to the link where single or multiple content elements change with the changing aesthetics of the times. For this reason, in the construction and improvement of the actual clothing fashion trend optimization model, it is necessary to efficiently innovate and create design elements in the process of correctly grasping the clothing fashion trend. Clothing design

elements mainly include silhouette, color, and material. At the same time, after the above clothing elements are confirmed, details should be taken as an important content to actually distinguish popular elements.

2. THE PROPOSED METHODOLOGY

2.1 The AR Technology

AR allows users to use the sophisticated 3D polygon modeling tools provided by 3ds Max to create models in an augmented reality environment. Air-Modeling provides a CAD (Computer Aided Design) interface that allows users to create virtual conceptual models in an augmented reality environment through some gestures. The modeling methods used in these systems are actually the same as those in traditional modeling tools, which is very difficult for children to master. Bergig et al. proposed a framework for constructing three-dimensional scenes in an augmented reality environment. This framework allows users to create common mechanical systems from some simple hand-drawn drawings. However, their system is only limited to some simple three-dimensional models and some specific attributes, which makes this system more suitable for certain specific application scenarios such as those related to mechanical systems. Augmented reality, English translated as augmented reality, referred to as AR in the industry.

Early augmented reality book cases require specific tools to be realized, and learners need special glasses tools to watch 3D scenes and animations. This is the case with Magic Book, the earliest example of using this technology in the education field. With the continuous maturity of technology, the combination of augmented reality technology and the application of mobile terminals has achieved a three-dimensional animation effect on the mobile phone screen. For example, Poonsri's research on the effectiveness of The Seed Shooting Game, the use of AR technology in 3D pop-up books, combined with storytelling skills, provides students with a fun way to learn English. Andreas Dünser and Eva Hornecker passed two AR books Big Feet and Little Feet and Looking for the Sun conducted experiments on how children realize interactive reading and how to independently use AR technology. The research results show that most children can use AR books independently without too much help, especially when the story in the book has a clear structure and interactive sequence (which can be used to reproduce or promote the storyline) . As AR technology has a more prominent impact on visual and auditory stimuli, Valéria Farinazzo Martins and others have studied Music-AR in order to train children's awareness of environmental sounds. Music-AR uses a series of dialogue games to cultivate children's perception of music. Through comparative experiments, it is shown that children can learn about pitch, sound intensity, duration and timbre through AR technology, so that they can prepare for music cognitive exercises in advance.

2.2 The Online Intelligent Course On Clothing 3D Simulation Design

Traditional clothing design work, more adhere to the past design methods, through hand-drawn design sketches, and then a series of design work, did not apply computer technology to the design work, and did not fully realize that computer-aided design in clothing Role in design. In addition, the application of computer-aided design does not fully reflect the style and aesthetic characteristics of clothing, so that computer-aided design is still subject to traditional clothing design concepts and cannot fully reflect the superiority of computer-aided design. Designers have not conducted in-depth research on computer-aided design, and their application in design is not enough, which also affects its role.

We can understand that in the first-level optimization process, the nature elements, model profile properties, color properties, material properties, and details of popular clothing are processed; the second-level optimization process is to perform corresponding clothing on the shape elements of popular clothing. The main points are highlighted; the three-level optimization process is to perform in-depth fashion element processing on the composition of the clothing according to the two elements of fashion clothing, and carry out the design and production of new products when the content conforms to the fashion trend elements. In the real clothing aesthetics and consumption awareness of clothing, the selection and arrangement of popular materials corresponding to clothing design element models is also in the process of effectively developing modern clothing design, and the corresponding elements of clothing design are carried out. Optimize and improve.

For clothing consumption, fashion depends on the stage at which consumers intervene. The degree of fashion of consumers depends on their own values and aesthetics. Different values, aesthetics and economic conditions determine whether they are in the initial period and climax period. Or add to the trend of fashion during the recession. Under normal circumstances, the individual consumer's fashion level remains unchanged, so we see that some people around are always fashionable, while others are always out of date.

2.3 The Mobile Software Realization of Online Wisdom Course System

At present, most of augmented reality is in the experimental demonstration stage, and there is no large-scale popularization application. It is necessary to solve the technical problem of registration and positioning first, and its huge application potential may be realized. Registration is one of the most basic problems currently restricting the application of augmented reality technology. In augmented reality, the corresponding objects in the real world and the virtual world need to be aligned with each other, or even precisely (the error is less than a millimeter). For example, in medical probe biopsy, if the virtual target is not aligned with the tumor, the surgeon may find the wrong tumor location and cause the operation to fail. If augmented reality lacks precise registration and positioning, it will not be accepted in many practical applications.

Computer-aided design also has richer colors, which can break through the limitations of pigments on design, so that clothing design can show more colors and increase people's aesthetic experience. Designers can use a variety of color patterns for bold collocation design, show the designer's artistic imagination, give play to the designer's artistic creativity, and inspire more design inspiration. The traditional clothing design method relies on hand-painting, and a large number of places need to be filled in the drawing. This will consume a lot of time and energy of the designer, the design efficiency is low, and the accuracy of the drawing cannot be guaranteed.

the application of sports APP helps to solve the contradiction between the shortage of national fitness venues and the low utilization of a large number of social stadiums, and even the idle waste. It improves the information level of the sports industry and effectively promotes the construction of the

sports industry informatization. process. In the process of developing national fitness exercises, many areas of our country have seen such a phenomenon. On the one hand, residents feel that the venues and facilities for sports, fitness and leisure are not enough; on the other hand, the utilization rate of a large number of sports venues in society is even lower. Quality is an important indicator of clothing products. The design of different materials can make clothing products show different attributes. With the design support of computer-aided technology, the fabric parameters can be defined to analyze the relationship between the fabric and the clothing product in the actual application process.

3. CONCLUSIONS

This article analyzes the 3D clothing design model based on AR. In the research on the optimization model of fashion design elements, we learned that in the actual development of the design and change of the three elements of clothing silhouette, color, and material, through the analysis and combination of the trend of each link, and according to the actual development the overall cultural direction and brand style of the clothing brand. In the process of online smart classroom, computer technology is used as a scientific support for the trend optimization model of clothing design, and the mobile software is managed by layers.

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A Two-Stage Process Discovery Algorithm Capable of Identifying Duplicate Tasks

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Abstract:Process Mining is a novel technology for discovering process-related information from business data, aiming to discover, perform compliance checks, and improve business processes. The discovery of business processes is the first step in process mining. Due to the inability of traditional algorithms to identify task instances with the same name but different execution semantics, i.e., duplicate tasks, this paper proposes a new process discovery method. Its main principle is to leverage the feature of transition systems that can track the pre- and post-execution states of tasks. This feature is used to distinguish tasks with the same name under different execution states. Subsequently, it constructs a set of directed flow relations that describe the predecessor and successor relationships between tasks. Then, it employs an inductive discovery algorithm, Inductive Miner, to transform the set of directed flow relations into a process tree for identifying complex relationships between concurrent, choice, and other tasks, which are then transformed into a Petri net. Experimental results demonstrate that this method not only identifies duplicate tasks but also reduces the number of implicit transitions in the model. This significantly improves the accuracy of the discovered process model compared to the Inductive Miner.

Keywords: process mining; business process discovery; duplicate task identification; transition system

1. INTRODUCTION

Business process discovery is one of the most challenging research areas within the field of Process Mining (PM)[1-3]. Its primary goal is to construct a process model that reflects real-world business processes based on event logs containing actual business execution information. This model extends beyond the control flow dimension, describing the sequence of tasks, to also incorporate additional attributes related to task execution. These attributes can encompass resources, time, roles, and organizational aspects.

The term "duplicate tasks" refers to tasks with the same name but different conditions or objectives during their execution within a business process. In other words, these are instances of the same task with varying contextual significance. Currently, existing process discovery algorithms do not support the identification of duplicate tasks[4-6].

To address this challenge, this study introduces the concept that the context of duplicate tasks[7-9], including the sets of tasks executed "before" and "after," task multisets, and task sequences, is different. In other words, the context of duplicate tasks is distinct. To achieve this distinction, a transition system is introduced to identify the states before and after task execution. In the transition system, tasks are represented as events, and the states before and after task execution are represented using sets, multisets, or sequences. Leveraging this characteristic, the study extracts the order relationships between input transitions and output transitions under the same state. This allows for the construction of a set of directed flow relations that describe the "predecessor" and "successor" relationships among duplicate tasks.

Subsequently, the advantages of the inductive discovery algorithm (Inductive Miner, IM)[10] are utilized to construct a process tree based on this set of directed flow relations. This enables the discovery of more complex task relationships within the set of direct follow relations. Finally, the output is a Petri net that can recognize duplicate tasks.

Experimental results demonstrate that this method significantly improves precision compared to traditional IM algorithms. In other words, it enhances the model's ability to accurately describe event logs.

The remainder of this paper is organized as follows. Section 2 discusses the related work. Section 3 introduces background knowledge. Section 4 introduces two-stage business process discovery algorithm. Section 5 describes the tool implementation. Section 6 describes the data set used in the experiments, introduces the experiments and shows the results of the evaluation. Finally, Section 7 draws conclusions and points our future research scope.

2. RELATED WORK

In the domain of Process Mining (PM), there are primarily four categories of business process discovery algorithms:

1. Direct Arithmetic Methods:

The first category involves direct arithmetic methods that analyze the sequential relationships between tasks. Examples of this category include the Alpha series algorithms, as seen in references [11-12].

2. Two-Stage Methods:

The second category encompasses two-stage methods[13]. These methods construct a low-level model, such as a transition system or hidden Markov model, and then transform it into a high-level model capable of describing complex relationships between tasks. An example is the Multi-phase mining algorithm.

3. Intelligent Computing Methods:

The third category employs intelligent computing methods, utilizing machine learning, deep learning[17], reinforcement learning, genetic algorithms, and continuous iterations to fit a process model that aligns with the event log. An instance is the Genetic Miner algorithm.

4. Local Methods:

The fourth category, known as local methods, focuses on discovering rules and frequent patterns between tasks and task sets rather than covering a complete process from start to finish. An example is the Declare model discovery method based on temporal logic language.

A transition system is a specific type of Finite State Machine (FSM). Its minimal components consist of the state before transition triggering, the transition itself, and the state after transition triggering. Each transition system defaults to the premise that any event can trigger a transition. After an event is triggered, a new state must be generated, and any state originates from the same initial state. Various characteristics of transition systems include subsets of different types of states being subsumed into different domains (regions), providing a method for synthesizing Petri nets.

Inductive Miner (IM) algorithm emerged in 2013 and is currently the only algorithm capable of making the discovered model perfectly match the event log. Therefore, it is often used as part of the business process discovery architecture. For instance, it discovers hierarchical business processes and can also discover cross-organizational business processes. The main principle of IM involves analyzing the sequential relationships between tasks and task sets to construct a process tree. This tree is then transformed into a Petri net. The process tree is a block-structured workflow net, where the leaf nodes represent tasks, and parent nodes are operators describing relationships between sub-trees. While IM ensures fitness of the model, it forces the model to record behaviors not present in the event log, sacrificing precision. Additionally, it cannot distinguish duplicate tasks, which is a significant factor leading to irrelevant behavior in the model.

To address these drawbacks, this paper introduces the use of transition systems to track task execution states. By distinguishing duplicate tasks based on the differing execution statuses of tasks with the same name, and leveraging the IM algorithm, the paper aims to enhance precision while ensuring fitness.

3. BACKGROUND KNOWLEDGE

Definition 1: Event. An event is the smallest element composing log data, representing an instance of a task's execution in a business system. It is denoted as e = (a, cid, resource, start, end, other), where A is a set of activity names, and 'a' represents the activity executed in the event. 'cid' denotes the unique identifier of the running instance, 'resource' indicates the resources required for the event's execution, and 'start' and 'end' represent the start and end times of the event's execution. Additionally, events can have more detailed attributes in different scenarios, such as education or healthcare, where event attributes may vary. 'Other' refers to additional properties. Let N be the set of events containing attribute sets.

Definition 2: Classifier. If there exists n ∈ N, for any event e in the set, #n(e) represents the value of its attribute n. Let UC be the set of cases, UA be the set of tasks, UL be the set of lifecycles, and UT be the set of timestamps. It is assumed that for any event e, it contains the following attributes: #case(e) ∈ UC, representing the case to which event e belongs (each event belongs to one case only); #act(e) ∈ UA, representing the activity name of event e; #trans(e) ∈ UL, containing lifecycle-related information for event e; #time(e) ∈ UT, indicating the timestamp when event e occurred.

Definition 3: Trace, Case, Event Log. A trace is a finite sequence of events. Let * be the set of all finite event sequences defined over a set, and a case is a finite sequence of events *, denoted as =<e1, e2, e3, ..., e||>, satisfying the conditions that each event can occur only once, i.e., for 1 ≤ j < k ≤ ||, (j)(k), and every event in a case has the same case identifier, i.e., e1, e2, #case(e1) = #case(e2).

An event log is a collection of finite event sequences, defined as L*. Here, L = {1, 2, ..., |L|}.

Definition 3: Multiset. A multiset is a collection in which elements can appear multiple times. Let m = [p3, q2] be a multiset defined over the set S = {p, q}, where m ⊆ B(S), m(p) = 3, and m(q) = 2 represent the number of occurrences of elements. B(S) denotes the universal set of multisets over S. Multisets are used not only to track the execution status of tasks but also for modeling event logs. A trace appearing in different cases can be represented using multisets.

Definition 4: Petri Net. A Petri net is used to represent the evolution of processes and can capture the control flow relationships between entities. It consists of a triple N = (P, T, F), where T represents a finite set of transitions, P represents a set of places, and F ⊆ (P × T) ∪ (T × P) is the set of arcs representing control flow in the Petri net. A marking (M) of a Petri net (N, M) is a multiset of tokens, where tokens are represented by black dots. M ⊆ B(P) indicates a multiset defined on places, representing the tokens held in the places. τ is an implicit transition introduced to ensure modeling correctness and can represent the silent execution of tasks.
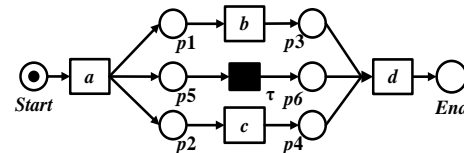
Figure. 1   The Petri net

Definition 5: Firing Rule. The firing rule describes the conditions under which transitions in a Petri net can occur. For x ∈ P ∪ T, •x = {y | y ∈ P ∪ T ∧ (y, x) ∈ F} is the pre-set of x, and x• = {y | y ∈ P ∪ T ∧ (x, y) ∈ F} is the post-set of x. A transition t in a Petri net N with a marking m satisfies the following condition: for any place p ∈ •t: m(p) ≥ 1. In such cases, transition t is enabled, can fire, and produces a new marking, denoted as (N, m)[t→(N, m'). If all input places of a transition contain sufficient tokens, the transition is enabled, can fire, and consumes one token from each input place, producing new tokens in the output places. In Figure 1, assuming the initial marking is a multiset [start4], after firing 'a,' it leads to [start3, p1, p2], 'a' is still enabled, and after firing 'a' again, it results in [start2, p12, p22], and so on. 'b' and 'c' become enabled simultaneously.

4. TWO-STAGE BUSINESS PROCESS DISCOVERY ALGORITHM

The algorithm proposed in this article essentially transforms the transition system into a collection of direct follow relations. It then applies the inductive miner algorithm to discover a model. The steps of Inductive Miner is shown in Figure 2.

(a)Event log

Phase 1

(b)DFG

Phase 2

step1.sequence({a},{b, c, d, e, f})
step2.exclusive({b, c},{d, e, f})
step3.parallel({b},{c})
step4.loop({d, e},{f})

Phase 3

(d) Petri net

(c) Process tree
$M = \to(a, \times(\wedge(b,c), \circlearrowleft(\to(d,e), f)))$

Figure. 2   The steps of Inductive Miner

Following the rules of the inductive miner algorithm, the process tree is further transformed into a Petri net. Additionally, let L={[1=<A,B,C,D>, 2=<A,B,C,A,D>]}.The primary principle of this method in the article involves traversing each trace in the event log, simulating the execution of the trace, and tracking the past and future states of each task within the trace. It assumes that the starting point of each trace's execution in the transition system is an empty set, denoted as `start`. Each task is represented as an event `e`. If, after executing the current task, the "future" state of the current event already exists in the transition system, the algorithm proceeds to the next task. If it does not exist, a new state is added to the transition system.The transition system generated from L is shown in Figure 3

(a) TS based on set state

(b) TS based on multiset state

(c) TS based on sequence state
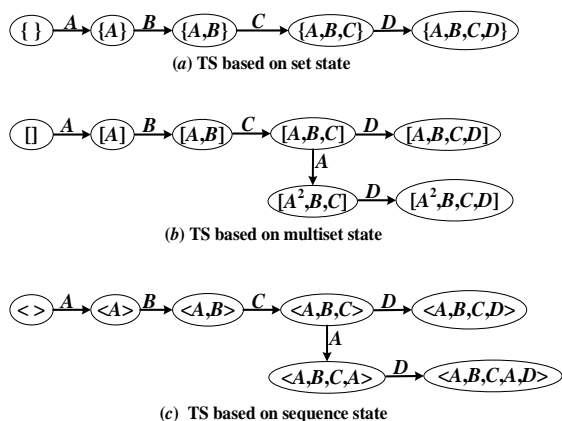
Figure. 3   The transition system generated from event log L

Because the collection of direct follow relations serves as the input for the inductive mining algorithm to discover the process tree, the transformation of the transition system into a collection of direct follow relations is the most crucial part of the two-stage discovery algorithm in this article. The main implementation principle involves two steps, firstly, traversing the set of transitions to assign different numbers to events or tasks with the same names in different transitions. This is done to distinguish events with the same name but different pre and post-execution states. Secondly, Traversing the set of states in the transition system, where the input events for a state become the predecessors of the direct follow relations, and the output events become the successors.Finally, the execution example of the two-stage discovery algorithm is shown in Figure 4.
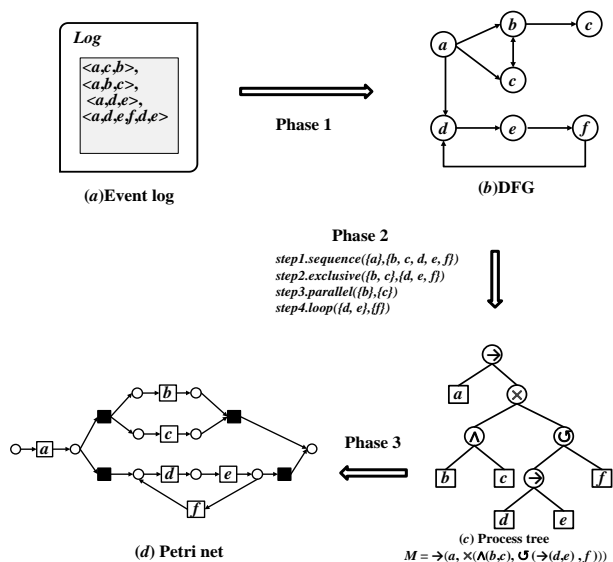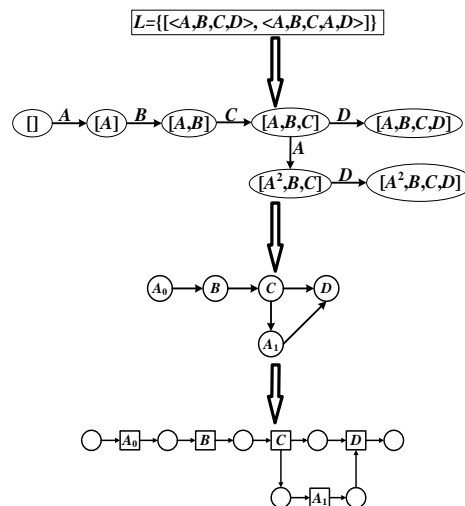

Figure. 4   Execution example of the two-stage algorithm

5. TOOL IMPLEMENTATION

In this experiment, we use a laptop with a 2.70 *GHz CPU*, *Windows* 10 Professional, *Java SE* 1.8.0_281 (64-bit) , Python 3.7.6 (64-bit) and allocate 12 *G*B of *RAM*. In addition, the drawing software *Origin* 2021 *Pro* version is used to show the experimental results.

The open source process mining tool platform *ProM* provides a fully pluggable experimental environment for process mining. It can be extended by adding plugins and currently contains more than 1600 plugins. The tool and all plugins are open source. Set coverage sampling approach proposed in this paper has been implemented in *ProM* platform as plugin, which called *Two-stage process discovery algorithm capable of identifying duplicate tasks*. The snapshot of this tool is shown in Figures 5. It takes an original event log as input and outputs a model.

Figure. 5   The instance of *ProM* plugin

6. EXPERIMENTAL EVALUATION

6.1 Experimental data sets

The data used in this article is sourced from reference [16]. In this chapter, online learning of "Microprocessor System Design" is used as a case study. To ensure user anonymity and privacy protection, the data has been appropriately formatted and cleaned. The original logs contained data records from the client system every second.This article selected relevant attributes and presented the data in a format suitable for process mining. The data attributes include chapters, student identifiers, and identifiers for each exercise practice. Each CSV file corresponds to a specific chapter or a specific student, and each file contains several exercise practices for that session. Each exercise practice

includes specific learning behaviors, and the performance data comprises two CSV files: final grades obtained from the end-of-course exams and stage grades obtained from student homework assessments in each class.An overview of the cleaned

event log is shown in Table 1. The "id" column represents a unique numerical identifier for a student participating in the online course.

Table 1. Online learning event log overview

Event log	Trace number	Event number	Event types number
Session1	77	71836	28
Session2	82	83014	38
Session3	87	60412	48

6.2 Experiment results

The fitness[14] results of both the algorithm in this chapter and the IM algorithm are 1, so no further records are made. The precision[15] comparison results are shown in Table 2. It can be observed that the algorithm proposed in this paper significantly improves the precision of the model while ensuring model quality. This ensures the use of a reliable process model for future process analysis. Additionally, it enhances the efficiency of model analysis, providing decision-makers with more valuable and accurate information.

Table 2. The algorithm evaluate results

Event log	IM	Two-stage	TS state type
session1	0.32	0.39	set
		0.42	multi-set
		0.42	sequence
session2	0.25	0.54	set
		0.52	multi-set
		0.49	sequence
session3	0.47	0.61	set
		0.58	multi-set
		0.62	sequence

7. CONCLUSIONS

This article introduces a novel process discovery method, the main principle of which is to leverage the capability of tracking the pre and post-execution states of tasks using transition systems. This feature helps distinguish tasks with the same name under different execution states. Consequently, it constructs a collection of directed flow relationships to describe the predecessor and successor relationships between tasks. Subsequently, it employs the inductive mining algorithm (Inductive Miner, IM) to transform the collection of directed flow relationships into a process tree. This process tree is used to identify complex relationships between tasks, such as concurrency and choice, and then further transform them into a Petri net.Experimental results demonstrate that this method not only identifies duplicate tasks but also reduces the inclusion of implicit transitions in the model, resulting in significantly improved accuracy compared to the Inductive Miner algorithm. In the future, further optimization of the identification of duplicate tasks within the transition system from a contextual perspective could lead to even more accurate process models.

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Integration of Structural Resilience, Loading Conditions, and Cost-Effectiveness in Optimizing pile-supported Quay Design

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Abstract: The article presents a comprehensive investigation into the design intricacies of quays in coastal regions, with a specific focus on open-type and closed-type quay structures. The study acknowledges the strategic importance of ports in such areas and their vulnerability to seismic and hydrodynamic forces. By synthesizing insights from diverse research endeavors related to the seismic behavior of wharves, the article elucidates the methodologies employed to assess stability and performance. The research is centered around Chamkhaleh Port and underscores the significance of innovative design strategies, especially in light of the vulnerabilities observed at the nearby Bandar Anzali port. The article meticulously analyzes design considerations, load distribution mechanisms, and cost-efficiency aspects, particularly in relation to pile diameters and lengths. The findings highlight the necessity of tailored design approaches to ensure the structural robustness of quays and to mitigate risks arising from various forces. The research not only offers valuable insights to engineers and stakeholders engaged in port infrastructure development but also advocates for safety, sustainability, and cost-effectiveness in the realm of port design and construction.

Keywords: component; Pile supported quay; Numerical analysis; Numerical analysis; Optimization.

1. INTRODUCTION

Coastal areas frequently host significant and strategic infrastructures, such as ports and facilities for industrial or tourist activities. Meanwhile, a considerable number of ports around the world are situated in regions susceptible to seismic and tsunami events, compounding the risk due to two intertwined factors: the pivotal societal function served by these ports and their vulnerability to natural hazards. Effective structural design plays a pivotal role in minimizing vulnerability and, by extension, reducing risk.

Numerous studies have been dedicated to examining the seismic behavior of wharves. For instance, Dodds et al. (2004)(Dodds et al., 2004) utilized elastic-perfectly plastic models to assess the seismic stability of the Kings Wharf in Suva, Fiji, incorporating site soil materials and piles. Similarly, Smith et al. (2004)(Smith et al., 2004) adopted a comparable modeling approach to evaluate a novel design for a wharf at the Port of Vancouver in British Columbia. Another illustrative instance involves the work of Roth et al. (2003)(Roth et al., 2003), who modeled several wharves along the West Coast of the United States. Their model integrated elastic perfectly plastic soil models and elastoplastic beam elements that could develop plastic hinges at predetermined locations. Similarly, Na et al. (2009)(Na et al., 2009) followed a similar modeling procedure to formulate fragility curves, characterizing the response of a typical pile-supported marginal wharf structure to ground motions generated under the SAC Project (FEMA 2000)(FEMA, 2000), which was a collaborative effort involving the Structural Engineers Association of California (SEAOC), the Applied Technology Council (ATC), and the Consortium of Universities for Research in Earthquake Engineering (CUREE). Lastly, Donahue et al. (2005)(Donahue et al., 2005) investigated the seismic performance of the wharf structure at Berth 24/25 of the Port of Oakland during the 1989 Loma Prieta earthquake. Shafieezadeh et al.(Shafieezadeh et al., 2012) investigated the

modal properties and vulnerability of such structures by using advanced structural and soil modeling procedures to perform two-dimensional nonlinear plane-strain seismic analyses using time histories of ground displacement and excess pore water pressures within the underlying soil embankment.

Quays establish a logical and coherent connection between the maritime and terrestrial sectors, selected and designed based on their utilization type, whether it's for cargo, passengers, or other various parameters. Apart from the quay's placement within the port, quay types can be divided into two categories, vertical face and open. (PIANC, 2001)

In open-type quays, the quay deck surface extends over the water with a forward slope. Water flows beneath it, and the deck surface transfers the loads from the upper superstructure elements to the load-bearing ground sections located in the depth. Generally, the quay's front edge should maintain a sufficient distance from the ground level to ensure adequate depth for vessel berthing. As a result, the decks are extended to the appropriate depth, or the quay's foundation is lowered to achieve the required depth. Since these quays advance further into the water, facing challenges from dryness and stable or sometimes unstable slopes, necessary measures should be considered to stabilize the shoreline slope, especially when sedimentation and periodic dredging are concerns during the quay's operation. (PIANC, 2001)

Another aspect of designing open-type quays is ensuring their structural integrity against various loads. According to valid maritime regulations, the structural elements of the quay must withstand loading scenarios such as dead loads, live loads, seismic loads, equipment and machinery loads, as well as forces generated by vessel berthing and mooring, including forces from fenders and bollards. The operational surface of the quay should not be jeopardized. Particularly significant for open-type quays is their lateral stiffness against horizontal forces resulting from fenders, bollards, and earthquakes, as

lateral loads are generally resisted by bending frames or diagonal structural elements. Therefore, structural modeling and analysis of the quay must accurately assess the lateral load-bearing capacity of deep foundations (piles) from the perspective of soil as well. In some cases, due to inadequate soil-bearing capacity, the construction of such quays might not be justified.

Another aspect related to these quays is their construction method. If open-type quays are initiated from the seaward side, employing barges, cranes, and pile drivers, the construction costs will significantly increase. Starting from the land side, the construction method is different. Seaward progress depends on installing piles, constructing the slab and beams, and ensuring that cranes and pile drivers can move forward onto the initially built deck. Therefore, the decision to construct such quays is generally made by considering all factors and their mutual impacts on the execution of the work. (PIANC, 2001)

2. STUDY AREA

This research centers on the Chamkhaleh Port, located in the southwestern quadrant of the Caspian Sea at coordinates 37.2155 degrees latitude and 50.2769 degrees longitude. Notably, the port features two rubble mound breakwaters, strategically positioned at the outlets of the Shalmanrood and Langaroud rivers, measuring approximately 530 meters and 430 meters in length, respectively. Since the construction of these breakwaters, significant sedimentation has occurred in the northern and southern parts, resulting in a considerable reduction of available water space to 190 meters and 130 meters for the northern and southern breakwaters, respectively. The sedimentation margin spans about 2 to 3 kilometers with a maximum width of 420 meters and a minimum of 80 meters.

Considering the planned capacity of one million tons and the current efficiency of the existing quays in Chamkhaleh, in this phase, the design and initial estimation have been conducted for one multipurpose service quay post and one developmental service quay post. Additionally, plans been outlined for another service quay post for fuel, a recreational quay post, and another multipurpose quay post.

in a recent study, Joushideh et al. (Joushideh, Majidi, et al., 2023) highlighted that the Bandar Anzali port is at risk of sinking and collapsing. They stress the need for new and creative designs to address this serious problem. Considering the close proximity of Bandar Anzali to Chamkhale, it's important to note that a similar situation could apply to Chamkhale as well. Therefore, when designing, it's crucial to take this into account.

3. QUAY LENGTH

The length of the quay is contingent upon vessel size, potential variations in the specifications of berthing vessels over the operational life of the quay, and the composition of berthing vessels (within port complexes). The designed vessel for Chamkhaleh Port is 140 meters in length, and 17 meters in width, with a required draft of 6.4 meters, accommodating a maximum of 15% annual inbound traffic. Subsequent vessel sizes, considering 85% of annual inbound traffic, are equal to or smaller than 120 meters.

As the allowable distance for berthing vessels is influenced by vessel size, in PIANC for larger vessels, the quay length

corresponds to the length of the largest vessel plus an additional 30 to 40 meters to accommodate mooring, thus a 150-meter quay has been designated as suitable for a 120-meter vessel (Pianc, 2002).

The length of the mooring structure in contact with the vessel is contingent upon cargo type and loading/unloading methods. Depending on the cargo type (such as iron and timber, currently being unloaded in Anzali), the unloading and loading equipment needs access to all cargo holds of the vessel. Therefore, the mooring structure's length in this study is equal to the vessel's length.

The proposed 510-meter quay length for the three 150-meter quay posts (for 120-meter vessels) is appropriate. Additionally, considering other combinations of the 140-meter designed vessel and smaller-sized vessels, as shown in Table 1, is viable.

Table 1- Possible Scenarios for Mooring Vessels Considering the Type and Length of the Vessel.

Quantity	Vessel Length	Quay Length	Final Summation
3	140	170	510
3	120	150	450
2	140	170	460
1	120	120	

According to PIANC, the clear distance from the ship's stern to the quay edge for vessels with the maximum draft in calm conditions is generally taken as 5.0 meters downwards. However, additional values for bed leveling error, leaning, and wave-induced movement must also be added (Pianc, 2002). In Chamkhaleh, the same sea bed level of 5.5 meters has been considered for the quay fronts.

In the design of ports, operational considerations must be incorporated within the framework of a larger transportation network, of which the port is a component. Practical aspects of the port's operations, such as ship capacity, equipment and machinery capabilities for material handling, dimensions and extent of the relevant storage depots, and the type of land transportation network, collectively determine the optimal economic scenario for the designated complex.

A pivotal indicator in port design is the area of the operational space behind the quays, measured in square meters per meter of quay length. In past years, due to smaller vessel sizes and lower cargo discharge and loading tonnages, the area per meter of quay length for supporting facilities, including deck space, storage areas, and rail/road lines, has been approximately 50 square meters. In this context, to ensure access to the maximum berthing length of the quays, they have been constructed in a long and narrow manner, as depicted in Figure 1.

Maximum water level changes were found to be approximately 30 centimeters. Illustrated in Figure 3.
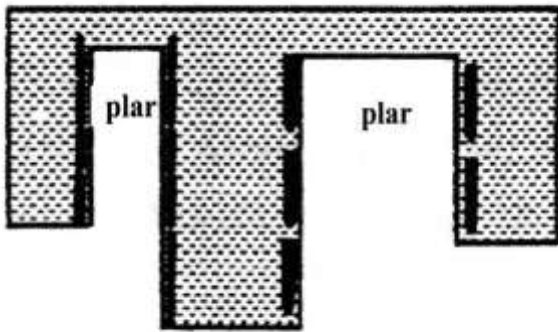

Figure 1. Modern quay designs emphasize a vertical alignment.

As ships grew larger and their cargo handling capacities and rates increased, the need for fewer berths and larger operational areas became more apparent. Consequently, the aforementioned indicator gradually increased from 100 square meters to 340 square meters per unit length of each quay. This shift was driven by the realization that a new fleet of ships twice the length could carry eight times the cargo capacity of an older vessel. As a result, in recent years, with the elimination of basins, all quays have been constructed in a linear arrangement, Figure 2. This configuration offers excellent operational efficiency and performance.
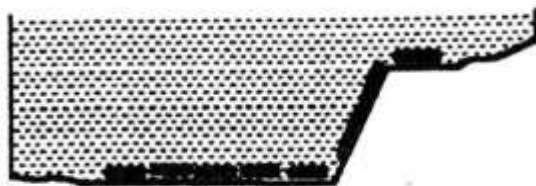
Figure 2. Quay layouts are designed to maximize operational areas.

4. HYDRODYNAMICAL CONDITION

In coastal regions, wind passing over the water surface generates shear stress due to air-water friction, leading to inclined water surfaces and elevated water levels near coastlines. Storm surges, including wind-induced run-up and wave generation, can cause significant damage. Understanding these hydrodynamic conditions is vital for coastal engineering projects.

To study the hydrodynamics of the Caspian Sea, Joushideh et al. (Joushideh, Shomal Zadeh, et al., 2023)adopted a comprehensive approach. They utilized hydrographic maps to create a bathymetric file with irregular triangular mesh representation, refining the grid for accuracy. Wind data was extrapolated across the sea to model wind-induced flows, and a calibrated hydrodynamic model was employed. The computational grid was designed to capture fine-scale flow characteristics. Time step stability and calibration coefficients were carefully chosen. By simulating wind-induced flows over 12 years, the researchers gained insights into water level fluctuations across the sea, focusing on specific coordinates.
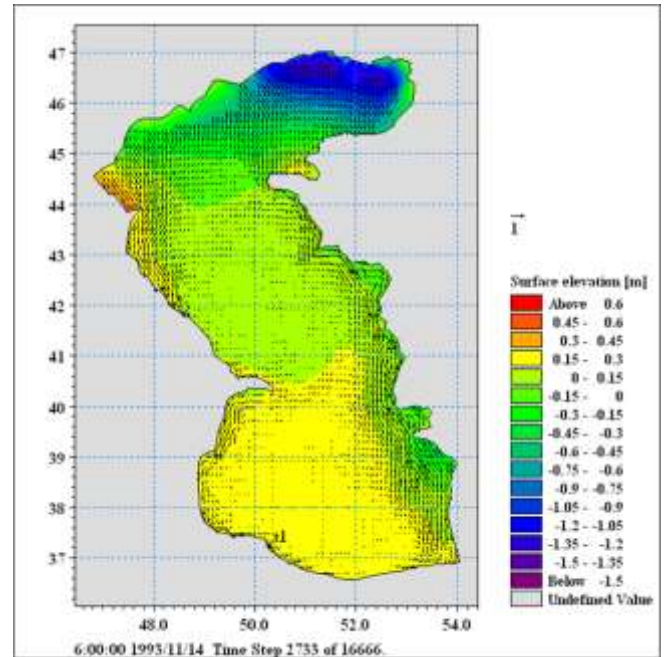
Figure 3. Water Level Fluctuations Across the Caspian Sea at a Specific Time.

Subsections Joushideh et al, also examined wind-induced flow rates, revealing predominant flow directions and low velocities. Using the Extreme Value Analysis method, the researchers estimated design water levels induced by wind for different return periods. They considered wave setup, wind setup, and long-term water level changes, presenting a comprehensive assessment of the total design level for coastal protection shown in Table 2.(Joushideh, Shomal Zadeh, et al., 2023)

Table 2 Design Water Level Values for Various Return Periods in Chamkhaleh Area (Joushideh et al)(Joushideh, Shomal Zadeh, et al., 2023)

Returnperiod [yr]	2	5	25	50	100
MaximumWave Setup [m]	0.29	0.29	032	0.32	0.32
MaximumWind Setup [m]	0.71	0.22	0.26	0.29	0.32
MaximumLong-term Level [m]	0.52	0.52	0.52	0.52	0.52
MaximumTotal Level [m]	0.98	1.03	1.1	1.13	1.16

5. LOADING

The loading of the quay, like other structures, consists of the following components:

Dead Load: Incorporates construction materials and fixed loads.

Live Load: Arising from vehicle-related loads, equipment associated with unloading/loading, as well as a uniform load for unloading/loading cargo onto/from the vessel. Considering

the port's utilization in Chamkhaleh, a uniform live load of 5 tons per square meter has been considered.

Earthquake Load: As per the methodology outlined in the Japanese code, the earthquake coefficient is a product of the regional coefficient, soil bed condition coefficient, and importance factor. For the Chamkhaleh port, the values of 1.4, 1, and 2.1 have been considered for the regional coefficient, soil bed condition coefficient, and importance factor, respectively. Thus, the earthquake coefficient is 1.7 (Kh), which is calculated for the operational-level earthquake. The force resulting from the vessel impact (reaction from fenders) is calculated based on berthing configuration, fender type, spacing, angle of impact, and other factors.(OCDI, 2020)

Considering that this force is compressive, it does not create critical conditions for closed-type quays but does affect the dimensions and alignment of beams and piles in open-pile and slab-type quays. Therefore, the initial assumption for design is 70 to 90 tons for the Fender reaction, which will be refined after the Fender design, and the final value will be used in calculations.

Mooring Force: According to PIANC, mooring lines are installed at intervals of 15 to 30 meters, which is set as 15 meters in this study. Mooring line capacity for berthing and loading, in accordance with PIANC for vessels ranging from 2,000 tons to 10,000 tons, must consider a 30-ton capacity for each mooring line (Pianc, 2002). In other codes such as Japan, for vessels between 3000 to 5000 tons, this force is specified as 35 tons. Accordingly, a mooring force of 35 tons is considered for this study (OCDI, 2020).

Lateral Loads from Soil and Water Pressure:For closed-type quays, lateral pressures from the soil should be considered under normal and earthquake conditions. Due to the presence of water on two sides and varying velocities on both sides, precise conditions must be controlled and calculated.

6. QUAY DESIGN AND ANALYSIS

In this section, we present a preliminary design for a 50-meter quay, outlining its essential specifications. The design encompasses both the piles and the deck, with a concrete deck and concrete piles featuring a diameter of 120 centimeters. The spacing between the piles is set at 6 meters along the width and 5 meters along the length of the quay.

Upon establishing the model and subjecting it to various loads, including live, earthquake, fender, and bollard loads, initial findings regarding the forces exerted on the piles have been obtained. Notably, the results reveal a compressive force (P) of 370 tons and a tensile force (P) of 53 tons.

To ensure structural integrity, it's imperative to consider a safety factor of approximately 2 to 2.5 for the piles. This entails that the vertical loads on the piles must withstand compressive resistance ranging from 740 to 925 tons during vertical pile load tests. However, taking into account soil conditions and practical constraints, the execution of 30-meter piles is deemed unfeasible. Consequently, accounting for 3 * 33 units of 30-meter piles, a total of approximately 1000 meters of piles are indispensable for a 50-meter quay.

Contrastingly, when considering a quay with contiguous concrete piles having a diameter of 120 centimeters, the calculation for executing 42 piles across a 50-meter length and a depth of 18 meters yields a total length of 756 meters. This length encompasses piles with a diameter of 120, which are required to be executed to a depth of 18 meters. The distinction between the two scenarios becomes more evident when factoring in cost differences arising from the varying depths of 18 meters and 30 meters, along with additional

expenses related to the drilling and casting of concrete piles. Furthermore, ancillary factors like formwork for beams and the deck must also be accounted for in estimating costs for an open-type quay. Consequently, it is evident that for an open quay with concrete piles of 100 centimeters in diameter, taking into consideration loading conditions, soil type, and execution method, the cost is expected to surpass that of a closed quay with 120-diameter concrete piles.

Alternatively, if the design involves steel piles with a diameter of 100 centimeters and a thickness of 18 millimeters instead of concrete piles, the associated costs showcase a substantial disparity between this scenario (open quay) and a closed quay featuring bonded 120-diameter concrete piles. The 3D model of pile supported quay is shown in Figure 4.
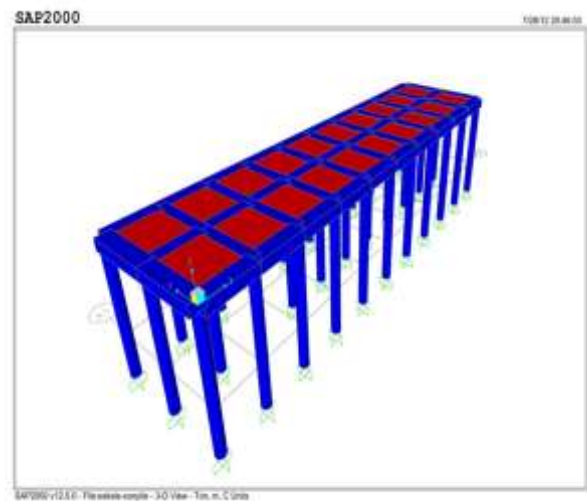
Figure 4. Three-Dimensional View of the Designed Model

This analysis underscores the intricate interplay of design, material selection, and practical considerations in determining the optimal construction approach for quays, ensuring both structural reliability and cost-effectiveness. The obtained results for vertical forces, bending moments at anchor points, and deformations caused by the fender force are presented in Figures 5 to 7, respectively.
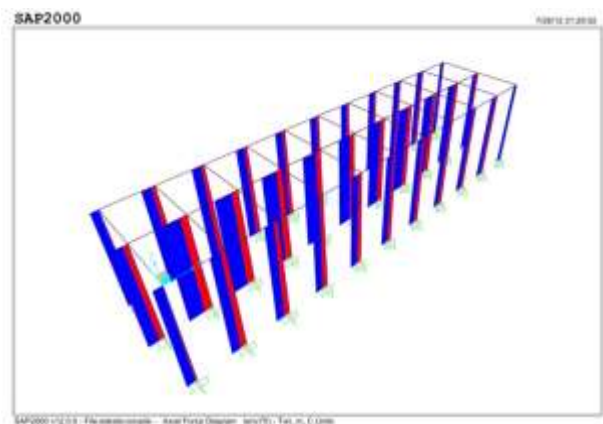
Figure 5. The vertical force distribution obtained from the analysis results.

Figure 6. The bending moment forces obtained from the analysis results.
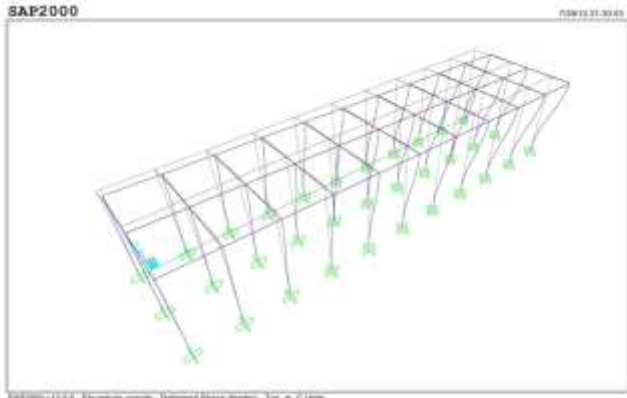
Figure 7. The displacements resulting from the fender force.

7. CONCLUSION

In conclusion, the outcomes of this comprehensive study shed light on the pivotal considerations in the design of quays, particularly in relation to the type of quay structure, loading conditions, and the behavior of piles under different forces. The distinction between open-type and closed-type quays has been elucidated, emphasizing the varying significance of vertical loads coupled with bending forces on the main load-bearing piles in open-type quays, and the prevalence of bending forces in closed-type quays. This distinction underscores the need for tailored design approaches that align with the specific structural characteristics and loading conditions of each quay type.

Furthermore, the study underscores the cost-effectiveness of using piles with larger diameters. The cost savings derived from employing larger diameter piles are not only attributed to the reduction in casing installation, removal, and internal drilling costs, but also to the streamlined labor and material expenses associated with shorter pile lengths. However, it is important to acknowledge that the extent of diameter increase must be judiciously determined based on the capabilities of local contractors, availability of suitable machinery, and rigorous project supervision to ensure optimal results.

In the broader context, these findings contribute to the ongoing discourse surrounding the efficient and resilient design of quay structures. By highlighting the nuanced interplay between structural behavior, loading conditions, and cost considerations, this study provides valuable insights for engineers and stakeholders involved in port and harbor infrastructure development. Future research endeavors could further delve into the practical implications of implementing these findings within the context of real-world projects, ultimately advancing the field of coastal and marine engineering towards enhanced safety, sustainability, and cost-efficiency in port design and construction. As the demand for reliable and resilient port infrastructure continues to grow, embracing innovative and cost-effective design approaches becomes increasingly crucial in safeguarding both maritime operations and coastal communities.

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Transformative Resilience in Port Infrastructure: Behavior Analysis of the New Oil Dolphin Quays Access Bridge at Bandar-e Anzali

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Abstract: Efforts are underway worldwide to revolutionize port facilities in light of global efforts to enhance port efficiency. Due to their pivotal role in shaping national vitality, port infrastructures need meticulous planning for alterations. There are a variety of applications for quay structures, including dry access to maritime areas, vessel berthing, and mooring, among others. The piled trestle configuration of the Bandar-e Anzali quays prompts an in-depth examination of the bridge structure for the new oil dolphin quays. Taking a comprehensive approach, this study examines the intricate interplay of geotechnical and seismic conditions. Using SAP 2000 software to model the access bridge structure meticulously, the study is grounded in a thorough understanding of foundational dynamics. Structural analysis is the main component of the investigation, navigating a wide range of loads and their intricate combinations. As a result, the study reveals the bridge's inherent stability, with stress ratios across all piles harmoniously convergent within acceptable thresholds. Essentially, this research highlights the convergence of scientific rigor, engineering expertise, and architectural vision. As well as demonstrating the stability of the access bridge, this study contributes to a broader discourse about the sustainability of port facilities at the intersection of economic progress and maritime connectivity. In a world of transformative infrastructure, the Bandar-e Anzali oil dolphin quays are a testament to a harmonious coexistence of science, innovation, and global connectivity.

Keywords: component; Port infrastructure, Quay structures, Structural analysis, Geotechnical conditions, Seismic assessment, Sustainability.

1. INTRODUCTION

The port of Bandar-e Anzali is situated in the northwestern region of Iran within the province of Gilan, strategically positioned between the Caspian Sea and the biologically significant Anzali Wetland. Depending on the categorization and projected magnitudes of commodities traversing its shores, the development blueprint for this port is meticulously shaped, thus requiring the design of quays that can accommodate various vessel types, including containers, general cargo carriers, and oil tankers [1,2]. Three oil dolphin quays are especially noteworthy because they facilitate the berthing of oil-carrying vessels.

In a recent study by Khodadadi Koodiani et al., the authors developed and optimized a neural network model to accurately predict the compressive strength of FRP-confined columns, offering valuable insights into the structural behavior of fiber-reinforced polymer (FRP) composite materials in construction and engineering applications [3].

In a study by Joushideh et al., the application of Ground-Penetrating Radar (GPR) for characterizing scour-induced subsurface deformations in port structures with contiguous pile walls was investigated, shedding light on the structural integrity of quay systems.[4]

Dolphin-type quays integrate a diverse array of elements, including an access bridge, platforms for loading and discharging, and mooring dolphins with specialized berthing amenities. In addition to providing vital connectivity between the platform and the access path aligned with the breakwater, the access bridge extends approximately 30 meters in length and 7.5 meters in width. As a matter of elevation, the level of the deck on this bridge is meticulously situated at 2.3 meters above mean sea level in Bandar-e Anzali [5,6].

This bridge's construction narrative is further complicated by the timing of its realization - after the completion of the breakwater infrastructure [7]. Instead of requiring pier piles, this innovative approach employs a foundation dimensioned to meet the unique requirements of this scenario [8], eliminating the need for the initial set. Applied to marine engineering and infrastructure design, this methodology exemplifies the vanguard principles espoused by contemporary engineers. Mahmoudabadi's work in 2021 delved into the utilization of viscous dampers for the retrofitting of reinforced concrete frames, demonstrating innovative approaches to enhancing the seismic resilience of key structural elements in port facilities [9].

With its intricate and expansive infrastructure, Bandar-e Anzali port stands as a testament to the seamless mixture of indigenous wisdom and scientific acumen in coastal and marine management [10,11]. Furthermore, the application of innovative engineering techniques, such as Fiber-Reinforced Polymer (FRP) confined columns and seismic-oriented design strategies [12], stands as an important mechanism for ensuring the port's edifices are resilient and long-lasting. A recent review article provides an insightful examination of concrete recycling, addressing the environmental challenges associated with the significant generation of concrete waste in construction and exploring sustainable approaches by incorporating waste materials into concrete mixes [13].

In a 2020 study by Mahmoudabadi, the behavior of cables with two spring-dampers and one viscous damper was thoroughly examined, offering valuable knowledge about the dynamic response of critical components within port infrastructure [14]. Figure 1 illustrates the overarching blueprint of these oil dolphin quays, which is the culmination of meticulous strategizing, innovative design paradigms, and

rigorous analytical scrutiny [15]. As a result of the sweeping tides of climate change and the potential for maritime mishaps [16], the structural robustness of these buildings assumes paramount importance. Ingenious consideration has been given to the impact of surface irregularities on the malleability of corroded steel plates immersed in marine environments [17,18], as well as the sturdy construction of rubble mound breakwaters.

A recent study conducted a comprehensive analysis of pseudo-static slope stability and numerical settlement assessment of rubble mound breakwaters under hydrodynamic conditions, providing valuable insights into the resilience of port infrastructures facing coastal erosion challenges [19].

These precautionary measures, in addition to safeguarding the port's operational efficiency, serve as a steadfast contribution to the seismic endurance of these architectural wonders [20,21], a parameter that gains added significance in this geographical area due to its seismic vulnerability [22]. In order to ensure the resilience and longevity of these structures under diverse environmental and operational conditions, dynamic evaluation, encompassing a range of stochastic influences [23], is a necessary part of the life cycle assessment process.
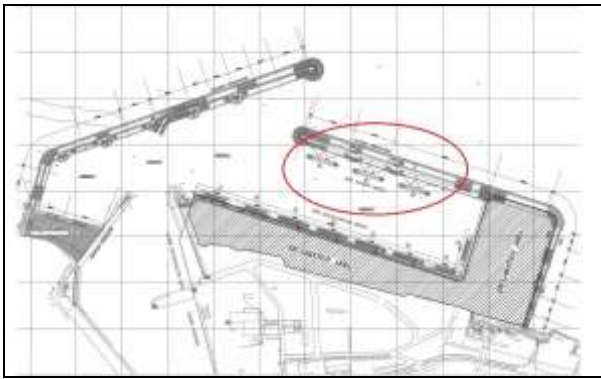

Figure 1. Spatial Configuration of Oil Dolphin Quay Positions.

2. STRUCTURAL CONFIGURATION OF THE BRIDGE

The access bridge core foundation consists of a harmonious amalgam of essential components designed to ensure both stability and functionality. It explores the complex interplay of diverse elements that underlie the bridge's robustness by analyzing its structural framework. Through a well-conceived framework of two discernible piers and an anchoring foundation, the access bridge manifests its architectural prowess as a vital conduit between the terrestrial realm and maritime infrastructure. The precise engineering and material finesse of each of the piers serves as the real cornerstones of this architectural masterpiece. There are three vertical supports, each meticulously arranged in concert to synergize their load-bearing abilities.

Transverse concrete beams connect these vertical pillars of strength, displaying seamless material and design integration. As well as serving as a crucial location for load distribution and dispersion, this concrete beam provides unity between the steel piles. With steel plate girders constructing the longitudinal girders, the structure is effectively channeled and distributed by the longitudinal girders. The axial strength of the steel piles creates the equilibrium of vertical load-bearing

capacity, transferring and balancing the various loads exerted on the bridge. A variety of piles provide multifaceted flexural capabilities, while strategically arranged transverse concrete girders provide lateral stability. Despite dynamic external pressures, these girders ensure steadfast stability even with strategically positioned horizontal forces.

The construction sequence unfolds as a meticulously choreographed symphony from conceptual to tangible realization. Steel piles are meticulously driven into the earth's receptive embrace in the first phase of structural execution, each plunge reflecting engineering precision. On top of the steel pillars, precast concrete caps serve as foundational keystones, serving as keystones for the elements to come. In the next phase of construction, the precast concrete formwork is deliberately positioned to herald the impending arrival of the transverse beam, which sheals the beginning of the ballet of construction. As the structural arteries breathe life into the edifice, this structural element is finely tuned to facilitate lateral stability. Concrete for the transverse beam is poured on top of the steel foundation, forming a balletic fusion of materials and design that serves as the foundation for the subsequent layers of architectural excellence to be built upon.

As a continuation of this symphonic journey of construction, steel girders, true embodiments of engineering prowess, are positioned with a seamless sense of purpose, signaling the beginning of the next phase. Taking into account the meticulously selected locations in which these girders will be installed, further entangling the structural integrity of the bridge with the architectural finesse that pervades every aspect of it. In the final crescendo of this orchestrated installation, the in-situ casting of the bridge deck slab culminates in an act of architectural alchemy which binds materials into a solid amalgam of form and function that will last for generations to come. I would submit that in summation, the structural system of the access bridge is not only an example of engineering ingenuity, but also serves as a microcosm of how meticulous design, careful material selection, and careful construction orchestration work together to create a truly magnificent architectural work of art. In the grand tapestry of scientific acumen and creative vision, each of the steel piles, each of the concrete beams, and each of the steel girders is a brushstroke of a grand tapestry. As an embodiment of the transformative potential of engineering, the Bandar Anzali access bridge stands not just as a conduit but as a bridge unifying scientific principle and tangible reality in pursuit of maritime connectivity, a bridge that merges scientific principle with tangible reality.

3. METHODOLOGICAL FRAMEWORK FOR DESIGN

Designed with a combination of scientific rigor and engineering ingenuity, the access bridge is a result of a combination of scientific rigor and engineering ingenuity where materials, forces, and structures are meticulously orchestrated to ensure optimal performance, safety, and durability. There is a large section in this chapter that delves into the overarching design methodology woven into the fabric of this architectural marvel, unraveling the threads of design philosophies that have been woven into the design.

Due to the fact that the pivotal elements of the access bridge are steel piles and longitudinal girders, a careful selection of the design methodologies becomes very important given the structural composition of the bridge. The guiding principle is the harmonization of materials and forces. This is a dance choreographed by structural design principles that ensure the equilibrium and resilience of the structures under

consideration. Sculpted from the resilient embrace of steel, the structural components form the very essence of this architectural ensemble's design, demanding a nuanced approach to their design, thus requiring a nuanced approach to construction.

It is evident that when it comes to the design of the steel piles and longitudinal girders that are intrinsic to the bridge's functionality, the compass of choice points toward the realm of permissible stress designs. This method, which is grounded in the principle of ensuring that the stress levels within the structural components keep within permissible limits, encapsulates the delicate balance that needs to be reached between maximizing the load-bearing capacity and safeguarding against material failure at the same time. There is a synergy between the principles of physics and the parameters of engineering when stress, material properties, and load dynamics interact to shape the contours of design, providing an elegant synergy between engineers and physicists.

While steel is an important component of the symphony of design, it is not the only one to reach its crescendo. Among the components that act as a bridge between steel and earth, the concrete deck slabs and the concrete transverse girders, are imbued with a design methodology that incorporates the inherent strength and material properties of each of these components. This is where the ultimate strength design method steps into the narrative, taking advantage of the power of comprehensive analysis in order to scrutinize both the concrete deck slab and the concrete transverse girders. Using this method, we are able to navigate the intricate interplay between the ultimate load capacities of materials, and their inherent strengths, to produce an outcome that accentuates both structural integrities, as well as preserving the delicate balance between performance and safety.

In the process of crafting the access bridge, a nuanced approach was taken to take into account permissible stress design and ultimate strength design for distinct components. As a result of this pluralistic strategy, each parameter of the design is aligned with its most appropriate counterpart, thus acknowledging the multifaceted nature of architectural compositions. As part of the design process, it emphasizes the careful orchestration of various design theories, meticulously matched to the specific properties and roles of each structural element within the larger structural ensemble. To put it simply, the design methodology underlying the access bridge is a testament to the intricate balance between scientific principles and engineering pragmatism that goes into an engineering project. There is more to choosing the right design methodology than merely deciding what works for the project; it is a statement that the architectural entity is committed to the well-being and functionality of its inhabitants. There is a deep harmony that resonates within the very foundations of the Bandar Anzali Bridge, a cadence that connects the theoretical principles and tangible structures, enabling a seamless transition between theoretical principles and tangible structures.

4. GEOTECHNICAL SUBSTRATUM ANALYSIS

There is no doubt that the geotechnical canvas upon which any engineering endeavor rests is integrally related to the foundation of that endeavor. Throughout this section, we will delve into the geotechnical conditions that provide the foundation for the design of the oil quay, which functions as an unyielding substratum on which the design depends. There is an intricate relationship between soil dynamics and architectural stability, as revealed by an investigation of layering and geotechnical parameters.

A simple glance at Table 1 is sufficient to demonstrate the extent to which the geotechnical landscape that determines the design of the quay has been thoroughly analyzed. There is a comprehensive tableau that illustrates the stratification of soil layers, each stratum encompassing a unique geological narrative that has been meticulously analyzed and deciphered through the process of scientific inquiry. There are fundamental tenets that inform the rationale for the design of the quay. These tenets inform the characterization of soil types, their respective thicknesses, and classifications of soil types.

Table 1. Layering and Geotechnical Parameters of Soil Layers for Quay Design.

Qualitative/Quantitative Description	Geotechnical Parameters
Sand	Soil Type
From Ground Surface to Bottom of Layer	Layer Thickness (m)
SM or SP-SM	Soil Classification
Medium to Dense	Soil Description in Terms of Compaction
1.7	Dry Unit Weight (t/m³)
30	Effective Friction Angle (º) φ
0	Effective Cohesion (t/m²)

There are nuances of soil dynamics that are communicated with precision through the terminological intricacies of geotechnical discourse. In order to ensure that geotechnical terms are tethered to specific contexts and adhere to technical conventions, it is imperative to acknowledge that they are invariably tethered to specific contexts. As a result, the purpose of Table 1 is to provide a conduit through which a comprehensible narrative underpins the design process by channeling the difficult language of soil mechanics. There is a need, however, to instill a tangible connection between abstracted tables and classifications that are abstracted from the physical world. There is a close connection between soil behavior under varying loads, dynamic forces, and environmental conditions, which materializes in a meticulous assessment of soil behavior. When it comes to fostering equilibrium and longevity, it is imperative that the structural load-bearing components of the quay interact with the subterranean geological strata that support them.

The symphony of geotechnical conditions is composed of notes, and each parameter is composed into a stanza, creating a melody that encompasses all the intricacies of the subsurface. Architects orchestrate an intricate ballet between the terrestrial world and the man-made world within the context of the cohesion between design and soil dynamics. A testament to the harmony between the forces of nature and the ingenuity of humans can be found in the foundation of the oil quay, which was conceived within the crucible of geotechnical conditions. The journey through geotechnical conditions gradually leads to the realization that the table is merely one manifestation of a much larger subterranean world, as the series of geotechnical conditions concludes. As

the layers of this world are layered upon each other, reverberating with the strains of geological history, carrying the resonance of millennia within them. As a result of the geological heritage and the architectural innovation of the oil quay, this world becomes the crucible within which the design of the oil quay takes shape.

Throughout the next section, we will examine more closely the intricacies of the design methodologies, the construction processes, and the seismic resilience of buildings. With this exploration, the oil quay at Bandar Anzali emerges as more than just a functional structure, but as one that embodies a harmonious dialogue between geotechnical forces and structural prowess for which the quay is both an embodiment and a catalyst for future development. In a symphony of equilibrium and engineering excellence, this building is a testament to the intricate relationship between the terrestrial realm and the architectural realm, where each support and shapes the other in a symphony of harmony and design excellence.

5. EXPLORATION OF ALLOWABLE PILE PENETRATION DEPTH

An intricate tapestry woven by structural engineers is that the very foundations upon which architectural endeavors stand, as well as the depths to which they reach, are intertwined within the intricate tapestry of structural engineering. In order to understand the subtleties that underlie the design of the oil quay structures, it is necessary to delve into the realm of the permissible pile penetration depth, a realm where engineering precision intertwines with geological responsiveness. There is a fundamental concept at the core of this investigation that can be described as pile length: a concept that transcends mere verticality to comprehend the implications of lateral load-bearing dynamics to a profound degree. This is due to the towering height of the piles adorning the oil quay structures, as this determines their lateral stability in the face of the diverse forces that interact with them. Computer modeling is complex, but it is essential that a judicious abstraction is made. This is a virtual penetration depth that incorporates pile behavior's myriad complexities.

It is evident that the determination of permissible pile penetration depth in both cohesive as well as granular soils is a delicate process that unfolds through the delicate cadence of equations, which is concisely represented by Zf.

$$z_f = 1.8T, \qquad T = \sqrt[5]{\frac{EI}{n_h}}$$

It is this mathematical realm that guides the traveler through a journey that is guided by parameters that resonate with the essence of a material's properties and the response of soil to the material. There is a complex interplay of variables in this equation, an intricate symphony of variables, which draws upon the modulus of elasticity (E) and the moment of inertia (I) of the pile, along with the coefficient of soil stiffness increase (nh), a parameter that resonates with the intricate interplay between soil and piles. As a result of the intricate equation, empirical relationships, as well as the soil type characteristic of the particular location weave their influence into the ultimate value of the coefficient of soil stiffness increase (nh) as a result of an assumed 1400 N/m3 for the coefficient of soil stiffness increase.

As a result of this equation, the permissible depth at which a pile can penetrate into a quay's oil platform is numerically rediscovered for the steel piles on the quay, which have a diameter of 34 inches and a thickness of 16mm. A careful calculation, based on the intricate interplay between the material attributes and soil dynamics, is carried out to determine a permissible penetration depth for the platform that serves as a sentinel guarding the integrity of the structure.

$$z_f = 1.8 \times \sqrt[5]{\frac{2e^8 \times 3.779e^{-3}}{1400}} = 6.33$$

A numeric embodiment of the harmonious convergence between the structural prowess and the geological receptivity is the 6 meters, the depth at which pile penetration is permitted with resolute mathematical precision. There is a real sense that this depth, chosen consciously, extends its influence not only to the platform but also to the access bridge, forming a seamless continuum that spans both architectural entities simultaneously. In order to ensure that the harmony between depth and height is maintained, this calculated depth, infused with both empirical wisdom and mathematical precision, operates within the framework of a design reference level established at -11 meters, which ensures that the depth and height will be connected in an appropriate manner. It is clear from the above discussion that the meticulous determination of the permissible pile penetration depth is more than a mathematical exercise; it is a demonstration of the ability to combine engineering precision with geological responsiveness. Ultimately, the oil quay structures pivot upon the depth that emerges from a crucible of equations and material attributes, the fulcrum upon which the oil quay structures rest. As we continue our journey, the discovery of depth is just one note in a grand symphony of design and engineering that shapes the oil quay structures, a testament to the harmonious interaction of human ingenuity and the dynamics of nature.

6. MODELING AND SIMULATION

There is no doubt that the foundation of modern engineering lies in simulation and modeling, where intricate structures and dynamic forces are brought to life in a virtual world that mirrors reality in a way that represents the underlying physical reality. The aim of this section is to reveal the sophisticated methodologies that were employed for the modeling and simulation of the access bridge, in order to provide a glimpse into the sophisticated tools employed for unraveling the intricate details of the design.

6.1 Computational Framework

For the modeling, analysis, and design of the access bridge structure, a comprehensive computational framework from the ANSYS software suite, version 20.2.0, is at the center of the modeling, analysis, and design process. As a paragon of the theoretical world of computational engineering, the software acts as a conduit into which the intricate interactions between materials, geometries, and forces can be interrogated numerically and meticulously dissected using this software, a paragon of the theoretical world of computational engineering. This digital expanse of ANSYS can be compared to a virtual laboratory wherein architectural visions can be submitted to the rigors of computational exploration in order to reveal their dynamic responses to various loads and scenarios in the absence of a physical model.

6.2 Geometric Representation

As a result of the application of finite element modeling to the access bridge, a construction marvel combining steel piles, concrete girders, and intricate supports, has become a digital representation. Taking advantage of numerical simulations, this geometric representation, which is composed of a mosaic of nodes and elements, captures the complex interplay between structural components as they are represented through a geometric representation. It is the finite element analysis which forms the basis for this modeling strategy with each element representing a discrete sub-section of the bridge, adhering to the fundamental principles of continuum mechanics in its design. Throughout this geometric model, which has been meticulously structured, steel piles, longitudinal girders, and transverse girders have been meticulously translated into finite elements because of their meticulous representation. As this structure is comprised of several elements which are interconnected electronically, these nodes act as anchors for virtual forces to pass through, allowing a deeper understanding of how the bridge reacts to a range of loading scenarios. The three-dimensional model of the access bridge is depicted in Figure 2.
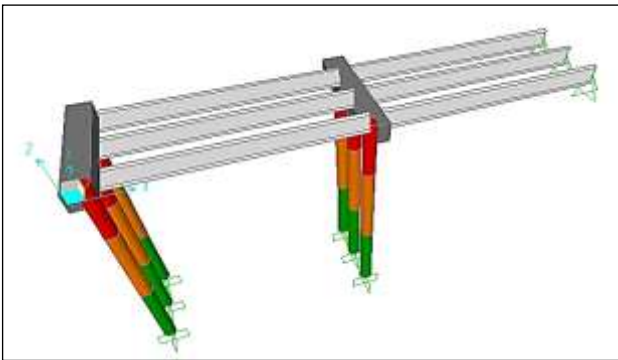

Figure 2. Three-Dimensional Model of the Access Bridge Structure.

In the characterization of pile sections, to account for the corrosion effects in three different environments: within soil, within water, and above water, thickness reduction of the pile wall has been considered as 1 millimeter, 3 millimeters, and 6 millimeters, respectively. Furthermore, in defining the cross-sections of longitudinal steel beams, a thickness reduction of 1 millimeter on each side of the section due to corrosion has been taken into consideration.
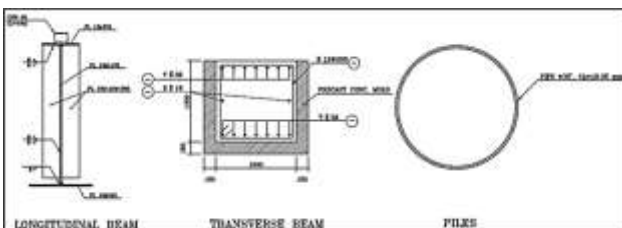

Figure 3. Cross-Sections of Structural Elements in the Access Bridge.

6.3 Material Attributes and Constitutive Models

A material model is a representation that transforms a material from a mere piece of matter into a dynamic entity defined by a set of dynamic attributes and constitutive properties. In order to fully understand the intricate relationship between stress and strain, constitutive models, and mathematical formulations that encapsulate this metamorphosis, are employed to capture this metamorphosis. During the construction of the access bridge, the steel piles and concrete girders were adorned with these constitutive garments, which imbued them with material properties that reflected real-world conditions. The steel piles, one of the most crucial load-bearing components of a structure, are endowed with a variety of material attributes generated from established mechanical testing and characterized by stress-strain relationships. This gives rise to a digital replica that can mirror the deformations and reactions that are observed in the real world. In the same way, concrete girders are also subject to the same rigor of material properties, which are designed to encompass the complexities of concrete behavior under a variety of loading conditions.

6.4 Boundary Conditions and Loading Scenarios

As intricate as the model may be, the imposition of boundary conditions and loading scenarios ensures that it remains anchored to reality through the imposition of boundary conditions. Digital narratives are shaped by these real-world influences, lending them a resonance with actual behaviors in the real world. This type of boundary condition, which has been meticulously defined within the ANSYS framework, mirrors the physical constraints that are anchored to the foundations of the bridge.

As if orchestrating the forces of a symphony, the loading scenarios unravel with a flowing cadence that seems like the orchestration of forces in a symphony. There is a systematic process by which dead loads, live loads, and environmental pressures are systematically incorporated into the model, in order to simulate the dynamic forces that the bridge will encounter throughout the course of its operation.

In Figure 4, the visual tapestry of the digital realm is depicted - a dynamic depiction of nodes, elements, and forces, which define the behavior of the access bridge within the virtual expanse as illustrated in the dynamic depiction of nodes, elements, and forces.

This representation, which acts as a bridge between reality and virtuality, is an excellent example of how modeling and simulation can play a key role in the development of superior engineering solutions. It will be our goal to explore the domain of structural analysis in the following sections, where we will embark on a journey of validation and exploration as we explore the numerical constructs. With the help of modeling and simulation, we can analyze the intricate responses of the access bridge to forces both anticipated and unexpected, revealing the resilience and precision that underlie its architecture narrative through the lens of dynamic modeling and simulation.

7. LOADING SCENARIOS AND ENVIRONMENTAL DYNAMICS

In having to deal with a diverse range of loading scenarios and the ever-changing forces imposed by an ever-changing environment, the bridge's structural mettle is tested and shaped continuously by the intricate interplay of the two. There is a substantial portion of this section devoted to the scientific underpinnings of loading scenarios as well as the dynamic environmental forces which converge to determine the structural integrity and resilience of a bridge.

7.1 Live and Dead Loads

Two types of loads are considered paramount in structural analysis: the dead load, the weight of the architectural components, and the live load, the transient force of vehicular motion that moves the vehicle. The meticulous orchestration of these loads transcends mere calculations; it is a process that harnesses the principles of statics and the material's properties to show how the bridge will react under varying loads. Dead loads are calculated by considering each slab layer, from the thickness of the deck up to the asphalt overlay, when formulating dead loads. This elaborate dance encompasses the nuances of design considerations, including guardrail allocation and load distribution, when it comes to applying dead loads across longitudinal girders. Several calculations have been made, which represent a numerical representation of gravitational influence, which not only contribute to the foundational stability of the bridge, but also to the dynamic choreography of the distribution of live loads.

There is no doubt that live loads originating from vehicular traffic pose a transient force that cascades through the bridge's structure on a regular basis. In the Iranian Bridge Loading Code, this force is meticulously defined in order to present a mechanistic representation of the motion of vehicles. In order to provide a safe, balanced bridge, the load's interaction with its structural components is more than just a numerical calculation; it encapsulates the very essence of the bridge's function and its ability to bear dynamic forces while maintaining equilibrium at the same time.

Taking into account a slab thickness of 25 centimeters, an asphalt layer thickness of 5 centimeters, and a longitudinal steel beam width of 2.5 meters, the load imposed on the longitudinal steel beams due to the weight of the slab is calculated as follows:

$$P_1 = 0.3 \times 2.5 \times 2.5 = 1.875 \ t/m$$

Assuming a concrete slab thickness of 30 centimeters at the location of guardrails and allocating 0.5 meters of the bridge slab width on each side for the installation of guardrails, the dead load imposed on the two adjacent longitudinal steel beams is calculated as follows: And the applied dead load resulting from the weight of components on the intermediate longitudinal steel beams is equal to:

$$P_1 = 1.875 \ t/m$$

The load of pipeline pipes within a 3-meter width section of the bridge slab, designated for their passage, is considered to be 1 ton per square meter. Taking into account the width of the longitudinal side beams and the intermediate beams relative to the pipeline load, the lateral longitudinal beam and the intermediate longitudinal beam carry a portion of the total pipeline load. Therefore:

$$P_5 = 2/3 \times 3 \times 1 = 2 \ t/m$$
$$P_6 = 1/3 \times 3 \times 1 = 1 \ t/m$$

In the context of this study, P5 and P6 denote the respective contributions of the lateral and intermediate longitudinal beams to the pipeline load.

The live load applied to the bridge structure encompasses a standard truck load, adhering to the guidelines stipulated by the Bridge Loading Code. According to this code, the live load consists of two components for each lane of the bridge:

a)A truck weighing 400 kN with a length of 10 meters, leaving 3 meters empty space both in the front and rear portions.

b)Along the remaining length of the lane, a uniform load of 15 kN/m is distributed, covering an area with a width of 3 meters.

This live load distribution, as specified by the Bridge Loading Code, is illustrated in Figure 4. The combination of these load components provides a representative scenario for the impact of vehicular traffic on the structural integrity of the access bridge. Figure 4 serves as a visual portrayal of this live load distribution. This diagram not only encapsulates the geometric arrangement of the applied loads but also underscores the adherence to regulatory standards in assessing the bridge's response to dynamic traffic loads. The configuration displayed in Figure 4 exemplifies the meticulous approach taken to simulate real-world scenarios and evaluate the bridge's ability to withstand and distribute the effects of live loads, safeguarding both performance and safety considerations.
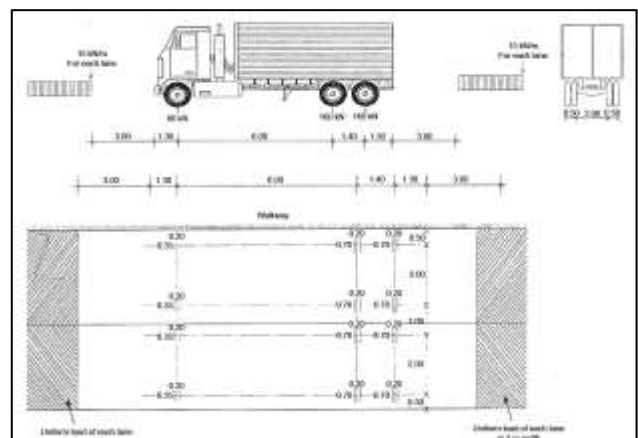
Figure 4. Standard Truck Loading

Truck loads entering each span of the bridge are analyzed for two cases: one causing maximum bending along the span and the other leading to maximum shear. The positions where the truck loads are applied are determined using influence lines for both bending and shear conditions. For transverse load distribution among the longitudinal girders, three scenarios are considered: the truck on the rightmost lane, aligned with the middle girder, and with the middle girder under its center. To distribute loads across the traffic path width, the bridge deck is modeled as a continuous transverse beam on support points corresponding to longitudinal girders. The reactions at these points are established for each scenario. These scenarios are illustrated in Figure 5. The load, denoted as P, represents the weight of a single rear axle and is 16 tons. In summary, precise truck load distribution analysis and its effects are crucial for understanding the structural behavior of the access bridge under different traffic conditions. Employing influence lines and adhering to load distribution standards provide a comprehensive framework that bridges theory and practical application, enhancing the bridge's overall integrity and performance.
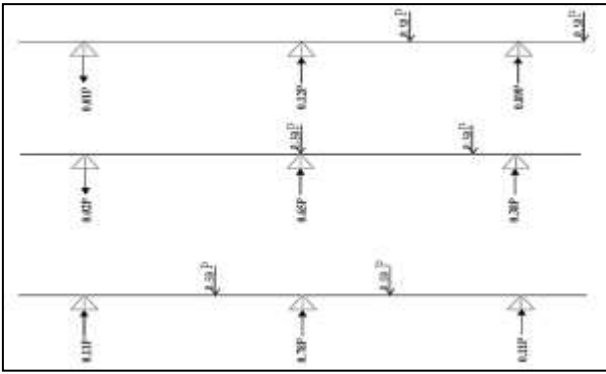
Figure 5. Distribution Scenarios of Standard Truck Load in Transverse Direction

The reactions at the supports in each of the three scenarios are depicted in the provided figure. Therefore, utilizing these reaction coefficients, the truck load is applied onto the longitudinal girders in both critical scenarios of maximum flexural moment and maximum shear force, under six load combinations labeled as Truck1 through Truck6. Furthermore, for applying the truck load in loading combinations, the impact factor must be considered. According to the Iranian Bridge Loading Code, the impact dynamic factor is determined using the following equation:

$$\delta = 1.3 - 0.005L - 0.15h$$

In this equation, h represents the embankment height on the bridge in meters, and L denotes the span length in meters. For the longitudinal girders, the impact dynamic factor is given by:

$$\delta = 1.3 - 0.005 \times 13.5 \cong 1.23$$

7.2 Environmental Dynamics

The dynamic forces imposed by the environment extend far beyond those that are imposed by static loads, creating a symphony of forces conducted by the elements themselves. An intricate ballet of forces is orchestrated by wind, water, and temperature, each of which imparts its signature on the bridge's behavior. This signature plays a crucial role in determining its stability and sturdiness. It was necessary to have a meticulous understanding of aerodynamic effects to be able to control the wind, the ethereal conductor of forces. In order to ensure that the bridge can withstand the tempestuous embrace of wind forces without compromising its structural integrity, the design considerations are guided by the assessment of wind-induced vibrations and flutter effects.

Another layer is added to the symphony of the environment by the nearby Caspian Sea, which serves as a living metaphor for the aquatic realm. It is essential that the bridge withstands the potential onslaught of salt-laden moisture, which necessitates consideration for the material's durability and protection against corrosion in the long run. This interplay between architectural form and the elements is a constant reminder of the dynamic interplay between architectural form and the elements as it is corrosive in marine environments. This bridge's behavior has been influenced by the fluctuations in temperature, a manifestation of Earth's rhythmic pulse as a result of its rotation and temperature fluctuations. Material expansions and contractions as a result of temperature variations require meticulous consideration within the design to accommodate these changes. It is important to remember that a bridge's structural response to thermal fluctuations is not just a calculation; it is a testament to the bridge's ability to adapt and endure even under the constant influence of changing environmental conditions. The next section of this paper deals with the realm of dynamic structural responses, where the numerical representation of the bridge is used to navigate the complexities of loading scenarios and environmental forces. The convergence of scientific inquiry and architectural design is at its zenith as the bridge's virtual counterpart, mirroring the interaction of forces, takes us on a journey of exploration and analysis of the forces at play.

8. LOAD COMBINATIONS AND STRUCTURAL SYNERGY

As things stand in the world of structural analysis, it is up to the symphony orchestrated by diverse loads to take center stage. The purpose of this section is to explore the intricate choreography of load combinations on the access bridge, where gravitational, vehicular, and environmental forces are integrated to define the structural equilibrium and capacity of the bridge. As a result of these load combinations, the bridge is able to withstand a spectrum of challenges because of the scientific rigor that underpins its capability to withstand them.

8.1 Load Combinations for Serviceability and Ultimate States

Throughout the model, the canvas is unfurled with meticulous precision, capturing all the nuances of the various load scenarios that can arise. The combination of loads acts as a brush stroke, panning a comprehensive picture of the response of the bridge to the different forces that affect it under different conditions. Table 2 illustrates the load combinations that challenge bridge capacity while maintaining operational stability. This is in the symphony of serviceability, in which structure functional integrity has priority. For the ultimate state, where the forces imposed to cross the thresholds of capacity, Table 3 provides load combinations designed to simulate extreme scenarios in order to evaluate the bridge's structural resilience under extreme conditions. It is at the intersection of vehicular, environmental, and seismic loads that the strength of the bridge is demonstrated, as well as its ability to withstand and safeguard its occupants from harm.

Table 2. Load Combinations for Access Bridge Loading in Serviceability State.

Load Combination	Dead	Pipe	Truck 1	Truck 2	Truck 3	Truck 4	Truck 5	Truck 6	EQx	EQy
ASD1	1	1	-	-	-	-	-	-	-	-
ASD2	1	1	1.23	-	-	-	-	-	-	-
ASD3	1	1	-	1.23	-	-	-	-	-	-
ASD4	1	1	-	-	1.23	-	-	-	-	-
ASD5	1	1	-	-	-	1.23	-	-	-	-
ASD6	1	1	-	-	-	-	1.23	-	-	-
ASD7	1	1	-	-	-	-	-	1.23	-	-
ASD8	1	1	-	-	-	-	-	-	1	0.3
ASD7	1	1	-	-	-	-	-	-	0.3	1

8.2 Dynamic Considerations in Load Combinations

It goes without saying that seismic forces play a pivotal role in the symphony of load combinations that occur when earthquakes occur. The resulting seismic loads, imparted in both the X and Y directions, are accompanied by an accidental eccentricity in the orthogonal direction, which is a testimony to the dynamic nature of seismic interactions. We have further nuanced the interaction between the earthquake forces by taking into account 30% of the force exerted in an orthogonal direction in order to create a more comprehensive analysis of the bridge's response to seismic events.

9. ANALYSIS RESULTS AND STRUCTURAL RESPONSE

An intricate tapestry of deformations and internal forces make up the bridge's structural response to this intricate orchestration of forces that manifest themselves as a nexus of numerical values. There is a numeric manifestation of the bridge's ability to withstand and adapt to seismic forces contained in its maximum lateral displacement resulting from earthquake loading on the bridge. This is a numeric expression of the bridge's ability to withstand and adapt to earthquake loading. The piles emerge as architectural pillars of support, bearing the brunt of the loads with resolute resilience as a result of the labyrinth of analysis and its complexities. It is evident from Tables 4 and 5 that the maximum bending moments, shear forces, and axial forces that will be applied to the piles in the event of serviceability and ultimate loads are shown in order to provide a better understanding of those forces. According to Figure 6, the allocation of numbers to these structural components mirrors the intricate anatomy of the bridge, revealing the bridge's unity in diversity in spite of its many components.
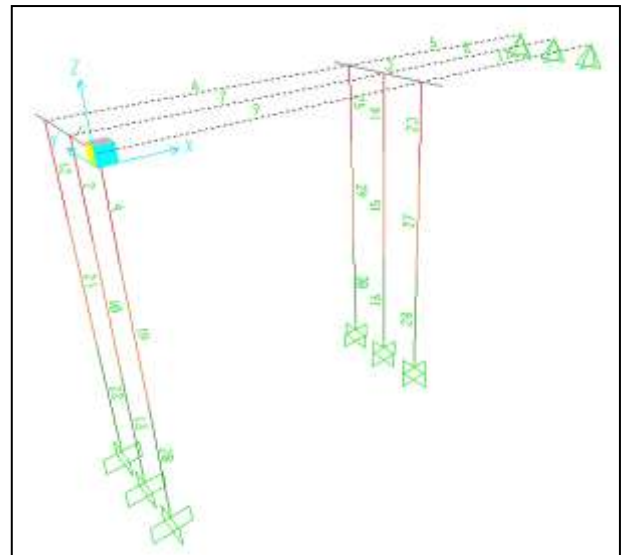

Figure 6. Identification of Structural Components in the Access Bridge.

Table 4. Flexural Anchor Values and Axial Force in Piles under Service Loads in X Direction.

	Value	Frame	Station	Output Case
M3 (Ton.m)	147/95	38	1/4	ASD8
M2 (Ton.m)	-89/38	30	5/51	ASD9
P (Ton)	-126/54	30	5/51	ASD9

Table 5. Values of Bending Moments and Axial Forces in Piles under Ultimate Loads.

	Value	Frame	Station	Output Case
M3	207/13	38	1/4	USD8
M2	-124/70	30	5/51	USD9
P	-178/44	28	5/51	USD5

The piles themselves, which have the capacity to carry a great deal of weight, are built from steel pipes with precise dimensions that have been forged. Steel's elastic modulus and specific weight, both intrinsic to the material's behavior, are intertwined with structural analysis to determine the piles' ability to survive. By controlling pile behavior against applied loads, SAP2000 emerges as a sentinel, ensuring structural stability and confirming that the bridge is capable of not only meeting but also surpassing the demands of engineering standards through its method of detecting structural instability. As a result of these analyses, a tapestry of pile stress ratios can be seen in Figure 7, which visually represents the findings.
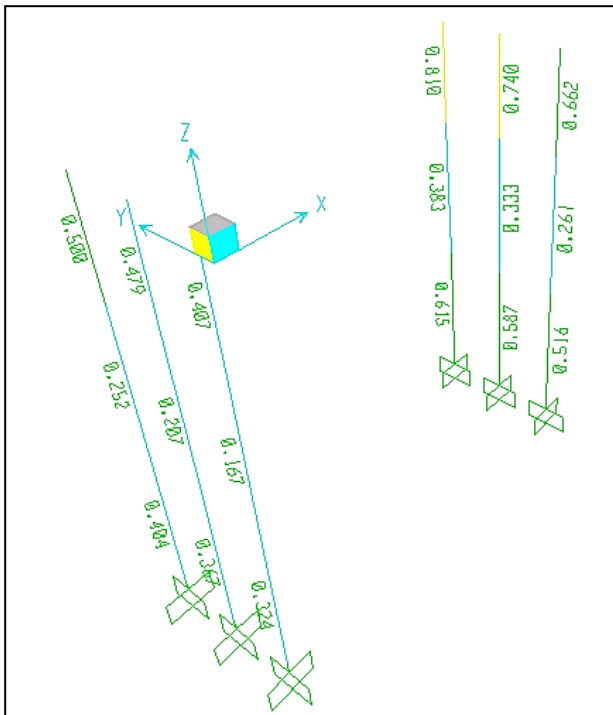

Figure 7. Pile Stress Ratios.

As an example of such a graph, which serves as an echo of complex mathematical calculations, this graph serves to demonstrate that piles are capable of bearing loads while maintaining structural equilibrium, no matter what the load will be. Unlike other graphs that provide a quick overview of the bridge's structural narrative, this graph provides a deeper look at the bridge's resilience and scientific rigor at each point on the graph. Upon digging deeper into the paper's depths, we come to a point when the bridge's architectural narrative reaches its denouement in the realm of conclusions, where the intersection of analysis and design is used to create an architectural triumph that resonates with scientific excellence.

10. CONCLUSION

The comprehensive analysis of the structural integrity of the new access bridge serving the new oil terminal in Bandar Anzali has come to highly favorable conclusions with regard to the structural integrity of the bridge. It is evident from a thorough examination of the stress ratios borne by all the piles of the structure that they all adhere steadfastly to the permissible parameters, proving the stability and adequacy of the structural framework. The investigation further indicates that if an earthquake were to occur, the maximum deflections experienced by the structure would be contained within a remarkably restricted range of deflections if the structure were to experience an earthquake. Particularly, these displacements can be quantified at just 4.6 cm on the X-axis and 1.4 cm on the Y-axis in the direction of displacement. The presence of such restrained deviations highlights the inherent resilience of the bridge in enduring seismic perturbations without affecting its operational stability as a result of the perturbations.

Although pile penetration depths are a pivotal issue, it remains prudent to address the issue with meticulous consideration, given the complexity of structural dynamics that are involved. It is important to recognize that since piles are relatively few, diligent scrutiny is required to determine the optimal penetration depths required to accommodate the gamut of tensile and compressive forces that may manifest within diverse loading scenarios. I would like to emphasize that it is imperative to emphasize that this determination will play a pivotal role in upholding the equilibrium and durability of the bridge under the complex interplay of forces that are at play within the structure. Taking a good look at the axial forces that are derived from the analysis, it is noteworthy that a coherent pattern emerges across all loading combinations as a result of the analytical assessment. All pile elements have axial forces aligned in a compressive direction such that no tensile forces will be generated within the pile elements due to the alignment of the axial forces. This cohesive response of the bridge is an indication of the structural stability of the bridge and the strength of the load-bearing capacity of its structure, enhancing a sense of confidence in the bridge's performance across a broad spectrum of operational scenarios. A culmination of this analytical exploration not only underscores the structural resilience and viability of the access bridge designed for the new oil terminal in Bandar Anzali, but it also serves as an exemplary example of how to combine scientific insight with engineering innovation to create a bridge that is structurally sound and viable. Beyond the immediate context in which this study was conducted, this study reveals valuable insights into the delicate balancing act required to determine how to fully integrate structural design with seismic considerations and material forces to achieve harmony. The maritime infrastructure faces an ever-evolving landscape of challenges, which is why this study stands out as a beacon, illuminating the path toward engineering solutions that are robust, adaptable, and scientifically informed.

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Aesthetic Education Teaching in Music Teaching in Universities Under the Background of the New Era

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Abstract: Aesthetic education teaching plays a vital role in music education in colleges and universities. In the context of the new era, aesthetic education teaching not only pays attention to the technical cultivation of music, but also pays attention to the cultivation of students' aesthetic emotions, cultural accomplishment and creativity. This paper will explore the development of aesthetic education teaching in music teaching in colleges and universities under the background of the new era, and explain its importance and driving factors.

1. INTRODUCTION

In the rapidly evolving landscape of higher education, the role of aesthetic education (also known as " Aesthetic education teaching " in Chinese) in music instruction at the university level has gained significant importance. As we navigate the complexities of the new era, the essence of music education is no longer confined solely to technical mastery and performance excellence. Instead, it extends its reach to encompass the cultivation of students' aesthetic sensibilities, cultural refinement, and creative abilities. This paper embarks on an exploration of the development of aesthetic education in the context of university-level music instruction in the contemporary era.

2. THE IMPORTANCE OF ART TEACHING

Aesthetic education teaching is one of the important ways to cultivate the quality of music education in colleges and universities. Its importance is reflected in the following aspects.

2.1 Cultivate aesthetic emotions and cultural accomplishment

Aesthetic education teaching helps students develop a deep understanding and appreciation of music, and improve their aesthetic emotions and cultural accomplishment. Students broaden their horizons and increase their cultural self-confidence by learning about different musical styles and traditions.

2.2 Promote creativity and expression skills

Aesthetic education teaching encourages students to participate in music creation and performance, cultivating their creativity and musical expression skills. This helps students better express their thoughts and emotions and improve their overall quality.

2.3 Interdisciplinary integration

Aesthetic education teaching can integrate music with other subjects to promote interdisciplinary thinking and the cultivation of comprehensive quality. Students not only learn music knowledge through music, but also broaden their knowledge areas and improve their overall quality.

2.4 Social responsibility

Aesthetic education conveys social information and emotions through musical works, inspires students to think and pay attention to social issues, cultivates their sense of social responsibility, and enables them to become socially responsible citizens.

2.5 International perspective

In the context of globalization, aesthetic education teaching can introduce international music elements to cultivate students' international communication and cross-cultural understanding abilities, so that they can better integrate into the international music field and contribute to international exchanges and cooperation.

3. FACTORS PROMOTING THE DEVELOPMENT OF AESTHETIC EDUCATION TEACHING

In the context of the new era, the development of aesthetic education teaching in music teaching in colleges and universities is driven by the following factors.

3.1 Support from education policies

The Chinese government has proposed a series of education reform policies, emphasizing comprehensive quality education, integrating aesthetic education into the education system, and providing policy support and resource guarantees for aesthetic education teaching.

3.2 Application of technology

The development of educational technology has provided new possibilities for aesthetic education teaching. Tools such as virtual reality and online education platforms can enrich the form of music teaching and provide a richer learning experience.

3.3 International exchange and cooperation

The title (Helvetica 18-point bold), authors' names (Helvetica Music is a cross-cultural art. International exchange and cooperation promote the exchange of music between different cultures and promote the international development of aesthetic education teaching.

3.4 Active promotion by schools

Music education institutions in colleges and universities actively explore methods of aesthetic education teaching, encourage teachers to innovate teaching content and methods, and provide students with a wider range of music education.

4. CONCLUSION

In the context of the new era, aesthetic education teaching in music teaching in colleges and universities is of great significance.It not only cultivates students' aesthetic emotions and cultural accomplishments, but also promotes the development of creativity and expression ability, enabling students to become comprehensive talents with an international vision and a sense of social responsibility. The development of aesthetic education teaching is driven by many factors such as policy support, social needs, technology applications, international exchanges and cooperation, and the active promotion of schools. In the future, music education in colleges and universities should continue to strengthen aesthetic education teaching, provide students with richer music education experience, and promote their all-round development.

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Innovation and Practice of Aesthetic Education Teaching Model in Universities

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Abstract: Aesthetic education in colleges and universities is an important part of the university education system and plays a vital role in cultivating students' creativity, aesthetic emotions and comprehensive qualities. However, with the continuous development of society and technology, the traditional aesthetic education teaching model may need to be innovated to adapt to the needs of the new era. This paper aims to study the innovation and practice of aesthetic education teaching models in colleges and universities and explore how to better cultivate students' sense of beauty and creativity.

Keywords: Aesthetic Education Teaching; Innovation; Practice; Model in Universities

1. INTRODUCTION

Aesthetic education in colleges and universities plays a key role in cultivating students' creativity, aesthetic emotions and cultural literacy. However, with the development of society and the advancement of science and technology, the traditional aesthetic education teaching model may no longer be able to meet the needs of students and society. Therefore, this paper aims to study the innovation and practice of aesthetic education teaching models in colleges and universities to explore how to better meet the needs of modern college students.

2. THE PRACTICE OF INNOVATIVE AESTHETIC EDUCATION TEACHING MODELS

2.1 Project-driven teaching

Some universities adopt project-driven teaching methods, encouraging students to participate in practical art projects. This approach helps students apply theoretical knowledge into practice and develop problem-solving skills.

2.2 Technology Integration

The use of new technologies such as virtual reality,augmented reality and online resources can enrich aesthetic education teaching content and provide more opportunities for interaction and creation.

2.3 Community Participation

Combining aesthetic education with community participation allows students to apply the knowledge they have learned in practical projects, while also promoting the cultivation of social responsibility.

3. PRACTICAL EFFECTIVENESS EVALUATION

3.1 Student feedback

According to the results of questionnaire surveys and face-to-face interviews, students generally believe that innovative aesthetic education teaching models are more attractive and can stimulate their interest and creativity.

3.2 Teacher feedback

Teachers said that innovative teaching models have increased their motivation to teach, but they also face some challenges, including insufficient teacher training and resource support.

4. DISCUSSION AND CONCLUSION

This study shows that innovative aesthetic education teaching models can better meet the needs of modern college students and improve their creativity and aesthetic emotions. However, innovation also faces some challenges, including issues of teacher training and resource support. Therefore, universities need to actively explore new teaching methods and provide support and training for teachers to promote innovation and practice in aesthetic education.

5. SUGGESTIONS AND OUTLOOK

In order to further promote innovation and practice in aesthetic education, we make the following suggestions.
Provide teacher training to help them better apply innovative teaching methods.Share successful innovative practice cases so that other universities can learn from and refer to them.
Continue to study the long-term impact of aesthetic education on students, including creativity, comprehensive literacy, and career development.

Through these efforts, we can continuously improve the quality of aesthetic education in universities, cultivate more creative and comprehensive students, and fully prepare them for their future careers and social participation.

Aesthetic education in and universities is an important part of the university education system and plays a vital role in cultivating students' creativity, aesthetic emotions and comprehensive qualities. However, with the continuous changes in society and technology, the traditional aesthetic education teaching model may need to be innovated to adapt to the needs of the new era. This paper aims to study the innovation and practice of aesthetic education teaching models in colleges and universities, and explore how to better cultivate students' sense of beauty and creativity.

Aesthetic education in universities plays a key role in cultivating students' creativity, aesthetic emotions and cultural literacy. However, with the development of society and the advancement of science and technology, the traditional aesthetic education teaching model may no longer be able to meet the needs of students and society. Therefore, this paper aims to study the innovation and practice of aesthetic education teaching models in universities to explore how to better meet the needs of modern college students.
The goal of aesthetic education in universities is not only to impart artistic skills and knowledge, but also to cultivate students' aesthetic emotions, creativity and interdisciplinary thinking. However, the traditional aesthetic education

teaching model may no longer be able to effectively meet the needs of students and society. This paper aims to study the innovation and practice of aesthetic education teaching models in universities to solve this challenge.

The traditional teaching model of aesthetic education in universities is usually classroom-centered, with an emphasis on skill development and the study of art history. Although this model has its advantages, it often ignores students' creative and aesthetic emotions.

The innovative aesthetic education teaching model emphasizes student participation, practice and interdisciplinary learning. This may include elements such as project-driven teaching, technology integration, community engagement, etc. to develop students' creative thinking and comprehensive literacy.

Aesthetic education is closely related to students' comprehensive literacy. It helps improve students' critical thinking, communication skills and problem-solving abilities. These are core skills required in modern society and the workplace.

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Evidence from the Urban-Rural Income Gap on Whether the Regional Multi Center Structure Can Alleviate Urban-Rural Imbalance

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Abstract: The integration of industry and education is the driving force and goal of the development of vocational colleges, the key to solving the structural contradiction of talent demand, and the objective requirement to improve the quality of talent cultivation. At present, there are still problems in the talent cultivation of art and design majors, such as low matching between talent supply and enterprise demand, insufficient close cooperation between schools and enterprises, and a single form of integration between industry and education. Exploring the construction of an applied art and design talent cultivation model, specific measures include establishing a composite teaching team, deepening the construction of professional connotation, highlighting the combination of "Taoism and technology" and "three equal emphasis" in talent cultivation, and achieving "four changes" in teaching reform and curriculum system construction.

Keywords: Urban-Rural, Income Gap, Regional Multi Center, Urban-Rural Imbalance

1. INTRODUCTION

Improving farmers' income is the fundamental solution to China's "three rural" problems. In fact, since 2004, seven consecutive No. 1 central document have been closely related to the "three rural" work, especially the income of farmers. At present, the problem of farmers' income in China is manifested in two aspects: on the one hand, farmers' income continues to grow at a low speed. At the beginning of the reform and opening, the household contract responsibility system greatly promoted the increase in production and income of farmers, and their income grew rapidly. For example, from 1978 to 1996, the per capita annual income of farmers increased by 25.9%. However, in the process of rapid economic development in China, the urban-rural income gap has not shown a clear trend of narrowing but has shown a continuous trend of expansion.

According to data from the National Bureau of Statistics, the urban-rural income ratio was 2.57 in 1978 and has shown a trend of increasing year by year. Especially since 2000, the urban-rural income ratio has reached more than three times, reaching a peak of 3.33 in 2009, and has since started to shrink. In 2015, the urban-rural income ratio was 2.73, and the urban-rural income gap is still significant. The reason for this phenomenon in the economic structure is that, from the perspective of China's economic development stage, China is in a stage where the industrial structure and income gap are in a positive relationship. That is, the expansion of income gap is conducive to the adjustment of industrial structure. However, in the long run, if the income gap continues to expand, it will inevitably inhibit the optimization and upgrading of industrial structure. From the perspective of regional correlation and differences, there are differences in the speed, quality, level, and scale of economic development among regions, leading to differences in income inequality and industrial structure development levels among different regions.

However, regions are interdependent, and income inequality not only affects the adjustment of local industrial structure, but also inevitably affects surrounding areas. Changes in income inequality have a spatial spillover effect on industrial structure adjustment. Therefore, it is increasingly important to conduct in-depth research on the dynamic distribution and changing characteristics of industrial structure and analyze the spatial correlation and differences between industrial structure adjustment and income gap changes. Changes in industrial structure will cause changes in the income of urban and rural residents, and the improvement of urbanization level will also affect the income of urban and rural residents. This article selects the upgrading of industrial structure and urbanization rate as independent variables, and the income gap between urban and rural residents as the dependent variable. Among them, the advanced industrial structure (IS) is calculated using the formula borrowed from Gan Chunhui's method: measured by the ratio of the output value of the tertiary and secondary industries, the higher the IS value, the higher the degree of structural upgrading.

The level of urbanization is reflected by the commonly used classic indicator of urbanization rate (UR), which means urbanization rate=urban population/total population. The larger the percentage ratio, the higher the level of urbanization. The income gap between urban and rural residents is reflected by the urban-rural income ratio (URIR), which is calculated as the ratio of per capita disposable income of urban residents to per capita disposable income of rural residents. The larger the value, the greater the gap. Yu Weiping pointed out that the important way to increase farmers' income is to strengthen the construction of rural infrastructure, establish and improve the direct subsidy system for farmers' income, the social security system, the land circulation system, the equal employment system, and the registered residence management system, accelerate the process of rural urbanization and urban-rural integration, and promote the transfer of rural labor to the secondary and tertiary industries.

2. THE PROPOSED METHODOLOGY

2.1 Comparison of urban-rural income gap

The above research provides valuable clues for understanding the relationship between changes in China's industrial structure and the urban-rural income gap and provides ideas for how China can narrow the income gap in the process of optimizing and upgrading its industrial structure. However, current research only considers the impact of the local industrial structure on the urban-rural income gap, neglecting the spatial correlation between regions and the resulting interdependence and mutual constraints. The existence of spatial correlation makes it necessary to include spatial factors in the analysis framework of economic activities.

Based on the above considerations, this article incorporates the study of the impact of industrial structure adjustment on urban-rural income gap into the framework of spatial economics and uses spatial panel econometric tools to analyze the spatial effects of industrial structure changes on urban-rural income gap. The location locking effect of spatial economics and the emphasis on industrial correlation in new economic geography provide us with reference for analyzing the phenomenon of industrial structure correlation and differentiation between regions.

He Yiming et al. (2011) found that there are certain differences in industrial structure among different regions. At the same time, due to trade exchanges, knowledge, and technology spillovers, as well as labor mobility between different regions, and the guidance and adjustment of macro policies, the industrial structure of a region is often influenced and constrained by surrounding regions. To explain the dynamic characteristics of VAR model and the impact of independent variables on dependent variables, Usually, a pulse response function is used. The impulse response function analyzes the dynamic impact of an error term on a system when it undergoes a certain impact or change, that is, a standard impact on an endogenous variable.

To measure the impact of advanced industrial structure and urbanization on the urban-rural income gap of the dependent variable, a two variable VAR pulse response model is constructed as follows. In China, the current "household average system" of equal distribution of agricultural land according to the proportion of people's heads separates land ownership and use rights, resulting in incomplete or ambiguous land ownership rights for farmers. In recent years, although the Chinese government has adopted a series of macroeconomic policies to promote agricultural land transfer, the procedures for agricultural land transfer are not standardized, the transfer level is low, the scope is narrow, and the scale is small. In practical operation, the rights and responsibilities are not clear, the sense of integrity is not strong, and the breach of contract behavior cannot be dealt with in a timely and fair manner. As a result, the land transfer of farmers or large grain farmers is not guaranteed, the land benefits are lack of protection, and even land disputes arise.

2.2 Regional multi center structure to alleviate income gap.

With the development of the economic level, the economic activities between different regions are more and more closely linked, and the change of the registered residence system, the labor force in some regions will not only flow between different industrial sectors in the region, but also flow across regions. In the process of cross regional flow, it will inevitably be affected by the industrial structure of the labor inflow region. Therefore, the industrial structure not only has an intra-regional effect on the income of urban and rural residents, but also has an inter-regional spillover effect. Changes in industrial structure not only affect the income of urban and rural residents in this region, but also affect the income level of urban and rural residents in other regions.

In the traditional empirical analysis process, if only time series data is considered, regional spatial differences will be masked. If panel data is used to analyze individual effects to reflect differences between different regions, but the horizontal spatial impact between different regions is still not analyzed. In recent years, spatial econometric analysis methods have gradually matured, allowing us to consider the role of spatial factors when analyzing the impact between economic variables.

Spatial panel measurement compensates for the shortcomings of traditional measurement that cannot comprehensively consider horizontal and vertical differences and can more accurately determine the relationship between variables. Therefore, this topic uses spatial panel measurement tools to analyze the direct and indirect effects of urban-rural income gap changes on industrial structure adjustment from the perspective of spatial correlation and spatial heterogeneity. To calculate the critical values of three period variables, in Eviews6.0, input URI=C (1) * (IS) ^ 3+C (2) * IS ^ 2+C (3) * IS+C (3), simulate the cubic curve, and calculate the two critical values of IS as 1.045 and 1.588 by taking the second derivative of the model; According to the previous IS statistical data, the ratio of China's tertiary to secondary industries in 2013 was 1.074, and in 2016 it was 1.297

China passed the "pain period" of industrial structure adjustment in 2013 and entered the "benefit period". When the ratio of the tertiary industry to the secondary industry reached 1.588, it entered the "stable period". On the other hand, the decentralized small-scale business model has led to a lack of professional division of labor among farmers in production. In addition, the natural conditions of "seven mountains, one water, and two fields" in the southern Hunan region have led to large input, small output, and low efficiency in agricultural production. As a result, the economic entities of individual farmers are unable to bear market risks, resulting in most farmers being self-sufficient in agricultural products and increasing production without increasing income. The backward farmer management system has led to low agricultural production efficiency and low commodity yield of agricultural products, thereby restricting the improvement of farmers' operational income.

Due to the typical urban-rural dual structure in China, some literature uses the urban-rural income ratio as an indicator to measure the level of income gap between urban and rural residents. Since the income ratio of urban and rural residents does not consider the different proportions of urban and rural residents in the total population, using the income ratio of urban and rural residents as an indicator to measure the income gap between urban and rural residents may have certain drawbacks. Therefore, this article uses the modified weighted coefficient of variation algorithm to calculate the income gap between urban and rural residents. The Gini coefficient is the most used indicator to measure the income distribution gap among residents.

When calculating residents' income distribution, the current household income and expenditure statistics are conducted separately for urban and rural areas. According to this statistical standard value, the Gini coefficient of urban and

rural residents' income can be calculated separately, but the Gini coefficient of national residents' income cannot be directly calculated. In addition, Chinese residents exhibit a typical urban-rural dual structure, and some scholars use the urban-rural income ratio as an indicator to measure the income distribution gap in China. If we only use the income ratio of urban and rural residents to measure the income distribution gap, there is a drawback of not considering the different proportions of urban and rural residents in the total population. Therefore, this article adopts a modified weighted coefficient of variation algorithm.

3. CONCLUSION

Promoting urbanization is an important way to promote the upgrading of industrial structure and narrow the income gap between urban and rural areas. Urbanization is the strongest potential for expanding domestic demand and an important part of industrial structure upgrading. Promote regional coordinated development through urbanization, open new spaces for economic growth and industrial upgrading, gradually transform eligible agricultural populations into urban residents, and narrow the income gap between urban and rural areas. Promoting the marketization of the agricultural industry to increase the operational income of large-scale homeowners is an effective way to increase farmers' income; Secondly, creating conditions for local or nearby transfer of rural labor to increase nonagricultural labor income is an important way to increase farmers' income; Thirdly, increasing fiscal and financial support to increase farmers' policy income is a necessary way to increase farmers' income.

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Research on the Development of E-commerce Logistics in Small Towns under the Background of New Urbanization

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Abstract: This article combines the development trend of rural e-commerce industry in China, starting from the analysis of the current situation of urbanization construction in our province, and focuses on analyzing the assisting role of developing rural e-commerce in promoting the construction of new urbanization. It explores the specific development mode of rural e-commerce, and should build a "dual flow integrated rural e-commerce platform" to provide farmers with a one-stop platform for obtaining information and online communication in production and life, attracting farmers Integrating returning college students into platform construction can better leverage the advantages of the Internet in promoting and trading agricultural products, help farmers enjoy services, and form clustered advantages of dispersed small agriculture through the Internet and big data. Through e-commerce platforms, farmers can grasp the initiative of the market, become rich on the spot, and promote the development of new urbanization.

Keywords: E-commerce Logistics, Small Towns, New Urbanization

1. INTRODUCTION

As of December 2023, the proportion of rural population in China's overall population has decreased to 47.4%, indicating the continuous progress of China's urbanization process. The No. 1 central document of the Central Committee of the Communist Party of China (CPC) in 2013 has clearly stated the development idea of "urbanization", that is, to take a road of coordinated and scientific development of "three modernizations" without sacrificing agriculture and food, ecology, and the environment. Under this general background, we should take the road of developing rural e-commerce and harmonious development of new urbanization.

The connotation of rural e-commerce has two aspects: firstly, it refers to the use of modern information technologies such as computers, the Internet, and multimedia to provide services for entities engaged in agricultural fields, enabling them to complete the transaction process of purchasing, selling, and electronic payment of products or services online. The second is to expand the field of rural information services through online platforms, connect various resources that serve rural areas, take root in rural areas, serve agriculture, rural areas, and farmers, making it a service station for agriculture, rural areas, and farmers throughout towns and villages, truly enabling the implementation of agriculture, rural areas, and farmers to become the biggest beneficiaries of the platform. Rural e-commerce, through market-oriented public e-commerce platforms, allows farmers to participate in the huge collaborative value network at a lower cost, learn to use information tools to serve one's own development, achieve a transformation from being a mere 'land digger' to being a 'new farmer' or 'new citizen', and truly achieve 'human urbanization'.

Rural e-commerce represents an advanced productivity that solves the problem of agricultural product production transitioning from traditional extensive to highly intensive in terms of production methods. It organically combines the pre-production, mid production, and postproduction stages of agricultural product production, effectively solving the problem of asymmetric information between agricultural product production and market. In the context of new urbanization, Anhui Province continuously improves the construction of the Internet and rural infrastructure in rural areas. The development of rural e-commerce has made important contributions to increasing farmers' income, deepening rural reform, and promoting agricultural modernization.

From the current emphasis of the Anhui Provincial Government, relevant policies introduced, and analysis of the current situation of agricultural e-commerce development, it is expected that the development of rural e-commerce in Anhui Province will exhibit the following trends: firstly, with the rise of the Internet and the growth of websites, the circulation speed of agricultural products will accelerate, and farmers' income will further increase. Secondly, due to the seasonal, regional, low producer quality, and low level of standardization of products, it will further promote large-scale production and strengthen the improvement of agricultural product quality standards. Collaborative e-commerce is an advanced stage of e-commerce application, which can effectively integrate various activities in the industrial chain from a technical perspective, truly realizing the functions of e-commerce.

2. THE PROPOSED METHODOLOGY

2.1 The Connotation of Rural E-commerce

Unlike traditional urbanization construction, the new type of urbanization construction adheres to the principles of people-oriented, urban-rural coordination, intensive and efficient, green and low-carbon, pays attention to protecting the interests of farmers, and emphasizes the improvement of urbanization quality. Agricultural collaborative e-commerce can provide opportunities for agricultural business entities to participate in large-scale agricultural industry collaborative networks at a lower cost and promote agricultural industry upgrading and transformation in a fair sharing, intensive and

efficient, green, and low-carbon manner. This is consistent with the construction principles of new urbanization. Therefore, in the context of new urbanization, agricultural collaborative e-commerce, as an advanced e-commerce model, can provide new theoretical and practical support for studying several issues related to new urbanization.

Developing rural e-commerce is an accelerator for expanding domestic demand, adjusting structure, and developing rural economy. It is an effective way to achieve modernization of agriculture and rural areas, transform traditional agriculture, and transition from traditional agricultural economy to information economy. It is an important content of building a new socialist countryside, and a driving force and new means for achieving new urbanization and building a harmonious society in our province. Rural e-commerce is the expansion and application of e-commerce in the rural market. The rural e-commerce model has gradually developed from the early bundled model of "agricultural products e-commerce" to a new integrated model of "urban-rural platform".

In the early stage, rural e-commerce only relied on the internet to release agricultural product sales information, and the main participants were large agricultural product processing enterprises and township enterprises. It was limited to the procurement of agricultural raw materials and product sales, with few participants and a single service content. On the one hand, traditional banks prioritize collateral over credit when lending, but rural e-commerce is just starting and often finds it difficult to provide appropriate assets as collateral. Especially some grassroots e-commerce groups are the most deserving of help in the development chain of rural e-commerce. They generally need financial support, but due to their early stages of development, it is difficult to obtain loans. Although some loans have been tilted towards farmers, in the actual operation process, farmers still encounter many obstacles that prevent the smooth progress of loans.

According to the concept of collaborative commerce mentioned above, applying collaborative e-commerce to agriculture can promote effective cooperation and integration of various businesses in the supply chain of agricultural enterprises and across supply chains, achieve coordinated management of various activities in the agricultural industry chain, and achieve the full utilization of agricultural resources. This is consistent with the principle of new urbanization construction. In order to better explore the significance and role of agricultural collaborative e-commerce in the construction of new urbanization, this article defines agricultural collaborative e-commerce as: in the context of new urbanization, agricultural enterprises are used as business units, and emerging technologies such as the Internet are used to construct an agricultural collaborative e-commerce platform, achieving the coordination and integration of various activities in the agricultural industry chain.

It is conducive to reducing the income gap between urban and rural areas and promoting the construction of a harmonious society. Rural e-commerce provides a reference for promoting inclusive growth in China, and this effect makes the imagination of "rural urbanization" possible. In the past, it used to be the norm for young people to go out to work in rural areas, leading to many "empty nest" families and various social ethical issues. The rise of rural e-commerce has attracted many migrant workers and college students to return to their hometowns for entrepreneurship or employment. The relationship between neighbors has become more stable and harmonious, and the issue of parenting for "left behind" children has also been resolved. If appropriate ways are

chosen to stimulate the enthusiasm of farmers, and there is no need to use e-commerce to create wealth from afar, everyone can be inclusive in the process of "integration of industrialization and industrialization".

2.2 The significance of collaborative e-commerce logistics in new urbanization

The awareness of offensive and defensive tactics is equivalent Most regions have not actively invested in agricultural information channels on a large scale, and information sharing, and service platforms are very weak. The radiation of information networks is narrow, only facing some leading enterprises, large agricultural households, and agricultural associations, failing to form a complete system for the production, collection, processing, analysis, release, exchange, and consumption of agricultural product information resources. Over half of the county-level rural website platforms are still very backward in construction, most townships have not established rural information service stations, which cannot meet the information needs of grassroots agricultural users. With the advent of the "Internet+" era and the continuous strengthening of government support, rural e-commerce has developed rapidly.

However, at present, there are still many problems in the development of rural e-commerce in our province in terms of policies and regulations, such as a lack of extensive legal education, risk prevention and awareness of rights protection, a unified local standard system for e-commerce, a network integrity system, insufficient market supervision, and a fast track for rural e-commerce, which seriously affect the development of rural e-commerce. New urbanization is not simply a pursuit of speed, but a new path of "intensive, efficient, green, and low carbon" centered around the key to improving quality and implemented into the ecological civilization construction of urbanization. The ecological civilization construction of new urbanization is to actively promote the construction of green towns, protect resources, and develop new energy and materials.

Relying on agricultural collaborative e-commerce to promote cooperation and integration of various business links in the agricultural industry chain, to achieve the full utilization of agricultural resources. Therefore, compared to traditional e-commerce models, the agricultural collaborative e-commerce model is more efficient in resource allocation and more suitable for the requirements of "intensive, efficient, green, and low carbon". In addition, in order to solve the problem of insufficient urban carrying capacity caused by rapid construction, we can fully rely on emerging information technologies such as big data, cloud computing, and the Internet of Things to promote the construction of "digital towns" and "smart villages", promote agricultural transformation and upgrading, improve the quality of urbanization through smart operation, actively protect the urban ecological environment, and pay attention to people's living security.

3. CONCLUSION

In terms of brand building, various regions can drive brand building through the development of advantageous characteristic industries based on local conditions, and further develop advantageous characteristic industries and create regional characteristic industry bases through centralized and large-scale operations. In response to the current weak awareness of internet and e-commerce application among farmers in most rural areas of China, local governments should formulate practical and feasible education and training

plans based on local conditions, popularize internet knowledge and e-commerce operation skills, guide small town residents and farmers to use internet thinking to transform modern agriculture and develop agricultural e-commerce.

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Innovation of Cross-Border E-Commerce Logistics Model Based on Decentralized Block Mining Model

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Abstract:This paper collects the case data of supply chain financial products based on blockchain technology. Through case analysis, combined with the business development of Z Bank's blockchain receivables platform, the platform business model process and risk control measures are sorted out and further analyzed.The research found that the Silk Chain cross-border e-commerce platform business model can make up for the shortcomings of the traditional cross-border e-commerce model, but compared with the cross-border e-commerce platform based on the public chain, the SilkChain model also has limitations, such as the SilkChain business model. The model relies heavily on traditional cross-border e-commerce platforms to provide industry resources and experience.

Keywords: Cross-Border, E-Commerce, Logistics Model, Decentralized Block Mining

1. INTRODUCTION

The development status, characteristics and deficiencies of my country's cross-border e-commerce business model. This part aims to clarify the basic situation of the business model of the Internet-based cross-border e-commerce platform [1]. By sorting out the business models of mainstream cross-border e-commerce platforms and based on the "three-dimensional conceptual model", in 2018, the world was filled with protectionist sentiments and unilateralism prevailed. country's trade war. The Sino-US trade war has become the focus of the world and will inevitably bring new challenges and pressures to cross-border trade [2]. Most foreign scholars start to study supply chain financial business from the perspective of enterprises. They mainly carry out relevant research and exploration on supply chain financial business from the perspective of how enterprises can better conduct production operations, capital operations and cash management [3].

Introduce the research background and significance, and describe the research content, methods, technology roadmap, innovations and deficiencies [4]. Internet technology has promoted traditional international trade from offline to online, cross-border e-commerce has become an emerging international trade method, and cross-border e-commerce platform business models have also emerged [5]. And expounds the working principle of applying the core technology to supply chain finance, so as to obtain the applicability of blockchain technology to supply chain finance and provides a template for more commercial banks to use blockchain technology, so as to enable more small and medium-sized enterprises Businesses benefit from it [6].

With the deepening of economic globalization and trade internationalization, the role of the shipping industry in promoting the integration of my country's economy and the global economy has become more and more prominent [7]. More frequent at present, there is no efficient collaboration model between various business segments, a lot of paper work and input work are required between different business segments, lack of data sharing mechanisms and system sharing capabilities, and communication costs are extremely high; International cross-regional [8]. Lee and Rhee et al. (2011) indicated that in international supply chain finance, the

management and control of corporate commercial credit risks can be better achieved, which is significantly better than the credit risk management and control of financial companies for individual companies [9].

Hofmann and Belin (2011) analyzed some international supply chain financial models. The emergence of SilkChain means that traditional cross-border e-commerce platforms have begun to explore the possibility of applying blockchain technology to business model innovation in cross-border e-commerce platforms [10]. The chain case will help to promote the transformation and upgrading of the traditional cross-border e-commerce platform business model. It is mainly based on the three major domestic mainstream models, the logistics enterprise-led model [11], the commercial bank-led model and the core enterprise-led model. And analyze the advantages, applicable objects and legal regulations of the three modes respectively. In addition, in the emerging field of e-commerce, Guo Ju'e, Shi Jinzhao, and Wang Zhixin (2014) elaborated on how supply chain finance is divided and developed in B2B online. The settlement efficiency of Wuhan Shipping Clearing Center based on blockchain [12].

This section is based on the basic assumptions of the settlement efficiency model of the Wuhan Shipping Clearing Center. Blockchain technology is a chain data structure [13], and a distributed ledger guaranteed by cryptography that cannot be tampered with and cannot be forged, has a weak center [14]. It has the characteristics of transparency, openness, traceability, cross-validation, encrypted authorized access, etc. At present, the regulatory authorities of various countries and regions around the world [15]. Hu Yuefei (2009) proposed that supply chain finance can effectively reduce the time cost and financial cost for SME financing and can also enhance the overall competitiveness of the industry. Xia Taifeng and Jin Xuejun (2011) pointed out that supply chain finance provides a direction for solving the problem of financing difficulties for SMEs [16]. Studying the Silk Chain case will help promote the transformation and upgrading of the business model of traditional cross-border e-commerce platforms, explore the development direction of the business model of cross-border e-commerce platforms based on blockchain, and help grasp the business model under the new

generation of information technology revolution. Model innovation opportunities [17].

2. THE PROPOSED METHODOLOGY

2.1 The Decentralized Block Mining Model

Cheng Hua and Yang Yunzhi (2016) conducted research and analysis on the different scenarios of blockchain technology in the financial field, explained the influence of blockchain technology in the traditional financial field, and proposed that commercial banks should use blockchain technology. Objectively understand and utilize this technology. Since the founding of New China, China's economic development level and cross-border trade have achieved leapfrog development, and achieved results that are admired by the world. The rapid development of China's cross-border trade has benefited from the guidance of China's reform and opening-up policy, as well as the continuous improvement and innovation of China's foreign trade policy. For transaction information at a certain point in time, a block is generated, and the block guards are connected to form a complete Verified, traceable data chain.

Support to provide retrieval and search functions for each piece of data, which can be verified one by one to prove the ownership of the secretary, which cannot be forged. The second category is based on the perspective of enterprise profit model. Some scholars believe that business model not only refers to the operation mechanism of the enterprise, but also includes the profit mechanism of the enterprise. This type of research focuses on the value acquisition of business models. For example, Georg and Bockm. (2011) believe that business models are methods for enterprises to allocate resources to obtain new profit opportunities. All enterprises can obtain "Haier Free Loan". This business model effectively integrates the funds of Ping and Bank, the professional advantages of supply chain finance and the distribution model of Haier Group. It is assumed that any participant of the two shipping settlement centers is single-owned, that is, one participant joins the Once the shipping settlement center 1 is established, the shipping settlement center 2 will not be added, and vice versa.

Since joining the WTO in 2001, China's cross-border trade relations have gradually deepened, showing a trend of diversified development. Data released by the Ministry of Commerce shows that the structure of China's export commodities has gradually shifted from light industry, low-value-added raw materials and products in the early stage to high-value-added, high-tech and finishing industrial products. The definition of supply chain is somewhat controversial.

2.2 The Cross-Border E-Commerce

Among them, Professor Song Hua from the School of Business of Renmin University of China gave a more standardized definition of supply chain finance: relying on core customers, on the premise of real trade background, using self-paying trade financing, through accounts receivable pledge Registration. Gao Bo (2018) analyzed the pain points of financial institutions in developing supply chain finance business, and found that there are challenges in supply chain finance business such as credit identification, transaction supervision, risk management and control, etc.

On this basis, the application of blockchain technology blockchain in supply chain financial business is analyzed to ensure a certain transparency of the supply chain. However, this requires accurate input and storage of data, so that users

on the chain can accurately use the data for transactions. It is also necessary for the enterprises on the chain to have a certain trust system. The chain in the supply chain is too long, and the transaction data is easy to be missing. According to the previous analysis, it is found that there is great uncertainty in the information between the cargo owner and the shipping company without the blockchain, and the blockchain model improves the relationship between shipping transaction entities. Because of the information asymmetry, there can be direct transactions between cargo owners and shipping companies.

Trust is an important element in cross-border trade. The logistics, capital flow and data flow in the business all need to rely on trust to maintain. However, in the current cross-border trade environment, there are few technologies that can be used to support trust. Instead, traditional paper guarantee documents and supply chain financing enable banks to control risks in the financing process from a dynamic and systematic perspective. The supply chain financing model can effectively control the credit risk of small and medium-sized enterprises, combining information flow, logistics, capital flow and business flow. However, in practice, the lack of a unified business information system among enterprises makes it difficult to unify the four streams. The development of my country's cross-border export e-commerce platform can be divided into three stages.

2.3 The Innovation of E-Commerce Logistics Model Based on Decentralization

The first stage: From 1999 to 2003, the cross-border e-commerce platform mainly provided product display and information disclosure services. The main representative company in this stage was Alibaba; the second stage: 2004 to 2012. The operational risk of the bank can be controlled according to the internal standardized process of the bank, but the agent has a deeper understanding of the business in the business link, and the bank is more dependent on the professional ability of the agent in the business. So, there will still be operational risk on the agent side. This section explores the impact of blockchain on the settlement efficiency of Wuhan Shipping Clearing Center by comparing the changes in the welfare level of Wuhan Shipping Clearing Center under the conditions of no blockchain and with blockchain.

Among them, the reasons for the participation of Internet-based cross-border e-commerce platforms will be analyzed in detail below. In the second part, for the participants in the implementation of the blockchain system, it is also necessary to include representatives of the platform manager, technical development and maintenance personnel. Because, considering the cost factor, it can be seen that the blockchain has a high added value to the welfare level improvement of the Wuhan Shipping Clearing Center. The added value of blockchain to the welfare level improvement of Wuhan Shipping Clearing Center without considering the cost factor.

Small and medium-sized import enterprises: First, due to the low credit rating of the enterprise, it takes a long time and is difficult to collect relevant information on customs declaration and risk assessment, and the customs clearance efficiency is lagging; second, it is difficult to obtain timely information on customs clearance and logistics, which is not conducive to customs declaration and logistics. The planning arrangement. Blockchain receivable confirmation and reconfirmation. Confirmation, that is, before the payment and transfer of the receivable, the confirmer provides credit

enhancement support for the full payment of the acceptor when the receivable is due according to the application of the confirmation applicant, or directly confirms.

3. CONCLUSIONS

Decentralization is an important feature of blockchain. There is no clear subject in decentralization, and there may be problems in supervision. As blockchain projects become geographically more decentralized and anonymous, domestic regulators need better laws and regulations to deal with violations of their laws under the new circumstances. And from the three dimensions of platform services, operating systems and economic feasibility, it summarizes the three characteristics of cross-border e-commerce platforms based on blockchain: the diversification of platform services, the integration of social e-commerce into the platform and a stable token system.

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Urbanization Function of Education for the Left-behind Children in China

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Abstract: Basic education for left-behind children in rural China is an important issue in Chinese society and is profoundly changing China's social structure. We should give it more (focus on the introduction). Based on the social selection theory of educational resources, this article explores the core-centered proportion of urban and rural education development in Chinese families through a panel data analysis model and a certain number of field studies. Then, based on the urbanization model, suggestions are put forward on how to ensure the balance and fairness of urban and rural educational development (goals/objectives).

Keywords: left-behind children; Urbanization; Educational migration; Equalization of educational resources

1. INTRODUCTION

China's urbanization rate has maintained rapid growth in the past 20 years, gradually increasing from 36.09% to 63.89%. At the same time, China's basic education has also significantly synchronized with urbanization. The number of rural basic education students has dropped significantly, while urban "new citizen" schools have continued to increase. In other words, in order to solve the problem of high-quality education for left-behind children in China, Chinese families accelerated the development of urbanization through educational immigration (a significant finding). On the one hand, this study inspires us to be good at giving full play to the role of basic education in promoting urbanization and ensuring the sustained and healthy development of education and urbanization. On the other hand, the government must provide balanced guarantees for basic education in the process of rapid urbanization and create a fair and balanced educational environment for China's large number of left-behind children (Enlightenment/Conclusion).

2. URBANIZATION AND EDUCATION TRENDS IN CHINA

Urbanization and education trends in China have undergone significant transformations in recent years. China's rapid urbanization process, marked by the migration of millions from rural to urban areas, has reshaped the educational landscape.

One key trend is the synchronization of basic education with urbanization. Urban areas have seen the establishment of modern schools with improved infrastructure, well-qualified teachers, and access to advanced educational resources. Meanwhile, rural schools have struggled with limited resources and a declining student population due to migration.

The result is a substantial shift in the distribution of students, with urban "new citizen" schools experiencing growth while rural schools face depopulation. This urbanization-driven trend underscores the pursuit of better educational opportunities for children, which motivates families to migrate to urban centers.

However, this trend also highlights educational disparities between urban and rural areas. Left-behind children in rural areas often face challenges accessing quality education and resources, and their emotional well-being can be affected due to family separation. Addressing these disparities is a crucial task for policymakers as they seek to balance urbanization and ensure equitable access to education for all Chinese children.

3. IMPACT OF EDUCATIONAL MIGRATION ON URBANIZATION

The process of urbanization, marked by the migration of individuals from rural to urban areas, is a global phenomenon that has been significantly reshaping societies and economies. In many developing countries, including China, urbanization has been driven by various factors, with one notable contributor being educational immigration. This essay explores the intricate relationship between educational immigration and urbanization, with a specific focus on China. We will delve into the dynamics of this phenomenon, its drivers, consequences, and implications for both urban and rural areas.

3.1 Drivers of Educational Immigration

Desire for Quality Education. The pursuit of quality education for their children is a driving force for many families. Urban schools often have better infrastructure, more experienced teachers, and access to a wider range of educational resources. This motivation has led to a significant influx of families into urban areas.

Economic Aspirations. Families recognize the link between education and future economic opportunities. They believe that access to urban education can improve their children's chances of securing high-paying jobs in the future, motivating them to migrate.

Peer Pressure. In rural areas, there is often a prevailing perception that urban education is superior. Families may migrate to urban areas due to societal pressure and the fear of their children being left behind academically.

3.2 Consequences of Educational Immigration

Rapid Urbanization. Educational immigration contributes to the rapid growth of urban populations. As families relocate, they become part of the urban demographic, increasing the demand for urban infrastructure and services.

Urban School Expansion. The influx of students from rural areas has driven the expansion of urban schools, leading to the establishment of new educational institutions to accommodate the rising demand. This has both positive and negative effects on urban areas.

Economic Impact. Urbanization driven by educational immigration can boost the urban economy. Increased demand for housing, goods, and services stimulates economic growth in urban centers.

Rural Depopulation. As families migrate to urban areas, rural regions often face depopulation, which can have detrimental effects on rural economies and communities. It can lead to the abandonment of agricultural land and a decline in rural infrastructure.

3.3 The "New Citizen" Schools

One notable consequence of educational immigration in China is the emergence of what are often referred to as "new citizen" schools in urban areas. These schools cater specifically to the children of migrant families. They play a crucial role in providing education to a growing segment of the urban population, but they also underscore the disparities in educational access.

3.4 Challenges and Disparities

Educational Inequality. While educational immigration aims to provide better opportunities for children, it can also perpetuate educational inequality. Children from migrant families often face challenges such as discrimination and limited access to quality educational resources.

Strain on Urban Infrastructure. The rapid influx of families can strain urban infrastructure, leading to overcrowded schools and inadequate facilities.

4. THE ROLE OF GOVERNMENT IN BALANCING BASIC EDUCATION AMID RAPID URBANIZATION

As urbanization accelerates, the role of government in balancing basic education becomes paramount. This is particularly crucial in addressing the challenges faced by left-behind children, a demographic profoundly affected by the migration of parents to urban areas in pursuit of employment opportunities. This essay explores the multifaceted role of government in supporting rapid urbanization while ensuring a fair and balanced educational environment for all, with a particular emphasis on the urgency of intervention for left-behind children.

4.1 Equal Access to Education

To create a fair and balanced educational environment, governments must prioritize equal access to quality education for all children, regardless of their geographical location or socioeconomic background. Policies should include:

School Infrastructure. Investing in rural school infrastructure to provide safe and conducive learning environments.

Transportation. Ensuring affordable and safe transportation options for students in rural areas to access schools.

Teacher Deployment. Encouraging experienced teachers to work in rural schools and providing incentives to retain them.

Subsidies. Offering financial incentives, such as subsidies for school fees and textbooks, to reduce the financial burden on families.

4.2 Curriculum Equity

Balancing basic education also involves ensuring that curricula are equitable and relevant to the needs of both urban and rural students. Government initiatives may include:

Rural Relevance. Adapting curricula to include rural-focused subjects, acknowledging the importance of agricultural knowledge and rural life.

Extracurricular Activities. Providing extracurricular activities that promote a holistic education experience, including cultural and vocational programs.

Digital Access. Expanding digital access to educational resources, especially in remote areas.

4.3. Teacher Training and Support

Supporting teachers in rural and urban schools is essential for maintaining educational quality. Government efforts should encompass:

Professional Development. Offering ongoing training and development opportunities to teachers to enhance their teaching skills.

Mentorship Programs. Establishing mentorship programs to support teachers in rural areas, helping them adapt to different teaching contexts.

Resource Allocation. Ensuring equitable allocation of teaching resources, including materials and technology.

4.4. Social and Emotional Support

Left-behind children often face emotional challenges due to family separation. Government initiatives should include:

Counseling Services. Providing counseling services in schools to support the emotional well-being of left-behind children.

Community Centers. Establishing community centers in rural areas to serve as safe spaces for children and offer extracurricular activities.

Parental Support. Offering programs to support parents in maintaining strong connections with their children despite geographic separation.

5. THE URGENCY OF GOVERNMENT INTERVENTION

The urgency of government intervention in addressing the educational disparities resulting from rapid urbanization in China cannot be overstated. Left-behind children, who are often victims of this phenomenon, face immediate and long-term challenges, including limited access to quality education and emotional well-being issues. Without timely intervention, these issues can lead to a less skilled workforce, social cohesion challenges, and a perpetuation of educational inequalities. Government policies and initiatives are essential not only for the well-being of left-behind children but also for sustainable urbanization and a more equitable future for all citizens. Immediate action is necessary to mitigate the negative consequences and harness the potential benefits of urbanization.

5.1. Human Capital Development

Human capital development refers to the process of enhancing the knowledge, skills, and capabilities of individuals within a society or workforce. It is a critical driver of economic growth and societal advancement. Effective human capital development involves investments in education, training, healthcare, and other forms of skill-building to empower individuals to contribute more productively to the workforce and society at large. It not only boosts economic productivity but also enhances the overall quality of life, reduces income inequality, and fosters innovation. Governments, businesses, and institutions worldwide recognize the importance of human capital development as a fundamental pillar for sustainable development and global competitiveness.

5.2. Social Cohesion

Social cohesion refers to the degree of harmony, cooperation, and unity within a society. It is a measure of how well individuals from diverse backgrounds interact, trust one another, and share common values and goals. Strong social cohesion fosters stability, reduces social conflicts , and promotes a sense of belonging among citizens. It is crucial for a healthy and functioning society, as it enables communities to address common challenges, such as economic disparities and cultural differences, in a constructive and inclusive manner. Policies that support social cohesion typically Prioritize equal access to opportunities, social inclusion, and efforts to bridge divides among various groups within a society.

5.3. Sustainable Urbanization

The urbanization function of education for left-behind children in China is closely related to broader urban sustainable development issues. Ignoring the educational needs of these children could hinder the long-term sustainable development of urban areas. Without equitable access to quality education, left-behind children may struggle to become productive members of society, perpetuating social and economic inequality. Addressing this issue is critical to promoting inclusive urbanization, allowing all citizens to actively contribute to the growth and development of their cities. Sustainable urban development must prioritize educational equity to realize the full potential of urban populations and ensure the future prosperity and resilience of urban areas.

5.4. Equity and Inclusivity

The urbanization function of education for left-behind children in China raises urgent concerns about equity and inclusiveness. As urbanization drives parents to migrate to cities, these children often face barriers to accessing quality education, perpetuating educational gaps. Ensuring equity means narrowing the gap in educational opportunities between urban and rural areas and providing left-behind children with the same opportunities for success as their urban peers. Additionally, promoting inclusion involves addressing the social and cultural challenges these children may encounter, such as discrimination or isolation. Prioritizing equity and inclusion in education is critical not only for the well-being of left-behind children, but also for building a fair and cohesive urban society in China.

6. CONCLUSION

The role of government in balancing basic education amid rapid urbanization is pivotal in creating a fair and balanced educational environment. Policies and initiatives aimed at equal access, curriculum equity, teacher support, and emotional well-being can help address the challenges faced by left-behind children. The urgency of government intervention cannot be overstated, as it directly impacts human capital development, social cohesion, sustainable urbanization, and the broader goals of equity and inclusivity. By prioritizing education, governments can ensure that the benefits of urbanization are accessible to all citizens and pave the way for a more prosperous and harmonious society. As urbanization accelerates, the government's role in balancing basic education becomes critical. This is critical to addressing the challenges faced by left-behind children.

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Analysis of Teaching Management and Reform in Universities from a Multidimensional Perspective

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Abstract: In recent years, the rapid development of the Internet has improved the timeliness of university teaching management work and changed the structure of university teaching management work. Therefore, universities should take the development of education in the Internet era as the core, analyze the current teaching management model, teaching adaptability, and management issues, and formulate some effective strategies for the reform of teaching management models in universities based on fully clarifying the importance of the reform of teaching management models in the Internet era. Domestic universities focus on scientific research and do not attach enough importance to teaching, without conducting research on methods to improve teaching quality. This article views the reform of teaching management in universities from the perspective of teaching academia, attempting to explore the rationality of teaching management in universities, and better solve the current decline in teaching quality and a series of problems in teaching management.

Keywords: Teaching Management, Multidimensional Perspective

1. INTRODUCTION

Nowadays, the development of the Internet has opened a new path for the promotion of teaching management in universities. Universities should seize the opportunity of this era, carry out reforms in the current teaching management mode, enhance the effectiveness and effectiveness of teaching management work, make up for the shortcomings of traditional teaching management in universities, and enable the development of teaching management work in universities to fully leverage the advantages of internet development. This will strengthen the multiple advantages of teaching management in universities under the background of the internet and improve the overall quality of teaching management work in universities.

In the current process of teaching management in universities, all management personnel belong to the group that needs to socialize with others for a long time. Therefore, their emotions at work directly affect their work quality. To enable them to obtain a better environment and healthy psychological emotions at work, professional measures need to be taken to regularly carry out training courses in universities. If a management worker is unable to release their emotions for a long time, it will lead to work problems, and they cannot take their job responsibilities seriously, which is not conducive to the improvement of the teaching management system in universities. Therefore, it is necessary to actively intervene and guide the emotions of these managers through specialized courses, so that they can treat different school affairs and work objects with a fuller emotional attitude.

Only in this way can the quality of teaching management be effectively improved, and the comprehensive development of management systems be further improved. The teaching management work of universities can be divided into two main categories according to the different management departments: one is the top-down management of higher-level education departments on their subordinate education departments, and the other is the organization and

management of their own education work by schools and educational institutions at all levels to ensure the normal progress of teaching work and comply with reasonable norms of university teaching order.

The connotation of teaching management discussed in this article refers to the second type of teaching management, which refers to the management of universities themselves. The teaching management work of higher education institutions is to complete teaching tasks, improve teaching quality, and cultivate high-quality talents that the country needs. Based on the teaching objectives and characteristics of universities themselves, they follow scientific and reasonable teaching laws, and use scientific management methods, reasonably organize and arrange teaching activities at different levels, coordinate and allocate all teaching resources in universities, ensure efficient and orderly teaching work, and achieve predetermined goals with high quality

Currently, most universities have insufficient understanding of the development needs of modern society and still prioritize theoretical teaching as the dominant approach, while using practical teaching as an auxiliary means. The practical teaching implemented in some universities has not strengthened the cultivation of students' practical operation ability and problem-solving ability and has not organically combined practical teaching with theoretical knowledge. Some universities, under the influence of traditional educational concepts and objective conditions, find it difficult to carry out practical teaching activities even if they clearly understand the importance of practical teaching due to objective conditions. In the process of practical teaching management, a detailed and comprehensive practical teaching plan has not been developed. When arranging students for on-site internships and experimental activities, the previous teaching mode is still used, and the teaching methods are outdated, which cannot meet the requirements of modern society for practical ability cultivation.

2. THE PROPOSED METHODOLOGY

2.1 The necessity of promoting the reform of teaching management models in universities under the background of the Internet

In other words, using simple and easy-to-use information technology equipment as the main tool for teaching management information reform can effectively solve the problem of insufficient equipment operation ability and limited understanding of information technology among university teachers, and improve the overall timeliness of teaching management work for university teachers. Finally, in terms of strengthening management investment, universities should make corresponding improvements in human resources, economic resources, and material resources investment, improve supporting facilities for information-based teaching management, and strengthen the introduction of relevant professional talents. Thus, we aim to create a professional teaching management team for universities from the perspective of the Internet.

In the new era of teaching management, schools can also establish various new platforms for these management personnel, allowing them to achieve smoother communication and exchange with each other through the construction of these diverse interactive platforms. When encountering some problems in school teaching management work, timely communication and resolution can be obtained, avoiding them from shifting blame and throwing blame on each other when encountering problems. Instead, everyone can concentrate their efforts to solve problems together, rather than creating more trouble. Therefore, in the information age, universities can build online communication communities and professional work communication systems around these management workers, allowing them to regularly submit their work responsibilities and specific work progress.

Only in this way can the learning and communication abilities between managers be effectively promoted. By collecting online materials and studying in their spare time, they can have more effective management experience, which can be shared with their work partners through these channels. The core content of university management work is teaching quality, but university teachers spend most of their time conducting scientific research and pay less attention to teaching work and academic research. The understanding of "teaching academic" by management personnel will have an impact on the application of subsequent teaching. At present, most universities have not clearly divided the management authority of schools, colleges, and departments, and in the process of practical teaching management, centralized management is still the main approach, firmly grasping decision-making ownership and depriving the original decision-making power of the hospital and department. The power of practical teaching management usually belongs to departments such as the academic affairs office and the personnel department. The Academic Affairs Office is mainly responsible for arranging, organizing, controlling, and evaluating the management of practical teaching. In practical teaching management, the responsibility of colleges and departments is to promote the smooth implementation of school decision-making, and their autonomy is deprived, which will seriously affect the independent practical teaching management work of colleges and departments.

2.2 Strategies for the Reform of Teaching Management in Universities from the Perspective of Academic Teaching

Strengthening innovation in teaching management is the key to enhancing the effectiveness of teaching management in the context of the Internet in universities, and it is also a scientific strategy to solve the single problem of informationization reform and development in teaching management in universities. To better achieve the diversification of teaching management work in the context of the Internet in universities and enhance their innovative ability in teaching management, universities should do a good job in innovating and optimizing teaching management from the following two aspects. Universities also need to recognize that in order to use the concept of emotional labor to command managers to promote the reform of teaching management systems, reasonable incentive policies need to be set up for them in their daily work, so as to transform the superficial role of these managers into deep role, from being careless and perfunctory about work to being able to independently regulate emotions and meet work requirements, this enables managers to have a clear understanding of work values and goals from their own cognitive perspective, allowing them to naturally exhibit positive emotions in their work.

Only in this way can the effect of deep acting be implemented, allowing managers to receive rewards that match their labor efforts in a certain reward system. In the process of establishing the reform of the teaching management system in universities, it can also help managers establish confidence in their work and gain their own recognition, which can help them form professional qualities of dedication and people oriented. The high quality of practical teachers is a prerequisite for cultivating students' practical and innovative abilities. Therefore, universities should invest sufficient funds to carry out teacher skill training, implement the requirements of "dual teacher" training, and cultivate a group of excellent practical teachers with rich theoretical knowledge, strong teaching skills, and high practical level through a series of effective training methods.

Strengthen the investment of funds, build various hardware facilities as soon as possible, highlight the importance of on campus training bases, increase the number of off campus training bases, and ensure their high stability. Only by simultaneously constructing on campus and off campus training bases can good environmental conditions be provided for the smooth implementation of practical teaching. Establishing an autonomous teaching management system refers to involving students in teaching management work, enabling students to provide some suggestions for the development of teacher teaching management work through teaching management feedback. By strengthening teaching interaction between teachers and students and improving students' learning management ability, the diversified development of university teaching management work can be achieved. Among them, universities should use information platforms to build interactive bridges for teaching management and adopt an anonymous system to carry out students' autonomous management practices. Teachers are mainly responsible for building an information-based teaching management framework, enabling students to organize their own learning and management work within a reasonable range.

Reasonably arrange the structure of the teaching team, fully consider factors such as knowledge and skills, professional

titles, education, age, etc., and leverage the influence of the teaching team on young teachers to build a closely united teaching team; In addition, establish common goals, learn from each other, unite and collaborate among team members, discuss problems encountered in teaching, carry out communication and discussion activities, exercise the team, and ensure that teaching work is carried out in an orderly and efficient manner.

3. CONCLUSION

In summary, the development of internet technology has changed the transmission mode of information data and social forms. The reform of teaching management models in universities should be aimed at improving the adaptability of education in the Internet era and apply some new educational concepts and teaching management information technology in the Internet era. This requires the use of emotional labor theory to guide their daily work practice, better play to positive emotional value, and provide more active thinking and serious work attitude in work. Only when managers gain positive emotions in their work can they achieve deeper roles and achieve corresponding work goals.

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Informatization Research on Teaching Management Work Mode of College Teachers Based on Cloud Real-Time Recording Terminal Data Sharing

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Abstract:The algorithm first decomposes the original waveform into three layers, and uses the improved absolute value difference method, the improved sequence similarity method, and the normalized cross-correlation method for matching in each layer, and finally achieves accurate matching. Fantasy Skyline brings together his life's creative approach and presents it with great maturity, with a bright and smooth melody in its structure. The entire musical composition contains more than 40 poems and is named after 14 of them. The creation of the works not only contains the passion and fantasy in the verse, but also is full of many profound irony. The search strategy of the hill-climbing method and the particle swarm optimization algorithm of the swarm intelligence algorithm are respectively used to realize the non-traversal search of the waveform matching algorithm.

Keywords: Spectral Feature Recognition, Foley's Vocal Suite, Fantasy Sky, Waveform Matching Algorithm

1. INTRODUCTION

Higher education has entered the stage of popularization, and its teaching quality has received unprecedented attention from the society. Student participation in daily teaching management has become one of the important links in the reform of higher education. The marketization of the employment of college graduates, the improvement of the society's requirements for talent quality, and the sense of urgency in career choice. Existing studies generally focus on the descriptive analysis of the cost-benefit of education informatization [1][2][3] and education informatization the construction of the evaluation index system [4][5][6] ignores to a certain extent the main body of education informatization - the significance of teachers' specific evaluation of it.

Ability is often regarded as the ability of people to successfully complete a certain activity, and it is the relatively stable personality and psychological characteristics and physical and mental strength displayed by relying on their own knowledge, skills and intelligence to understand and transform the objective world. The 21st century is an era of knowledge and information, which puts forward new requirements for talents in many aspects, especially in terms of ability and quality. In the process of designing the software, we found that there are two main problems that need to be solved to complete the application: first, the background server hard disk capacity and backup management problems. Due to the continuous accumulation of images, the hardware investment will continue to increase. At the same time, the system hardware failure causes The risk also increases at the same time; the second is the problem of multi-terminal sharing, that is, a background service multiple different terminals for access. Therefore, the essence of evaluation is the judgment and definition of value.

According to existing research, it can be concluded that the task and function of evaluation is not to reveal the essence and law of things, but to grasp the nature, size, change and possibility of its value. Teaching and student management in colleges and universities has always been a It is a arduous and arduous task. Over the years, colleges and universities have

invested a lot of manpower and material resources in this area. However, in the case of traditional manual operations, there are many inconveniences and many disadvantages are exposed. Cloud storage is not storage. Instead, the service cloud storage can integrate the node machines on the local area network or wide area network to form a new logical storage platform to provide external storage services, so it is not a single device, but a collection of devices.

The user will not just access one of the machines, but an external storage service implemented by software. The predecessor of the protocol is a kind of instant messaging protocol, which is often used in China. Adopting the protocol in the personal cloud to push the change message of files and data, it can make timely response to the changes of files and data. Since the protocol is based on, it inherits flexible development and is extensible, so the text is It is not a simple message, it can carry out complex data and documents including various formats of communication. At present, most of the colleges and universities in our country have implemented the management mode of secondary colleges, and most of the college students have also participated in teaching evaluation activities.

But on the whole, students did not participate extensively in the daily teaching management work, and there was a phenomenon that the goals of managers and those under management were inconsistent. This study believes that, as one of the main "users" of college education informatization, teachers' satisfaction level with college education informatization is an effective indicator to reflect their performance level. This is the starting point to explore teachers' service to college education informatization. It is beneficial to education management departments and colleges and universities to improve the idea of education informatization. The new requirements are reflected in the education and teaching goals, which are mainly reflected in: (1) The transformation to high-level learning ability: (2) Various related abilities in the age of technology (3) the ability to control and adapt to change; (4) the ability to cooperate; (5) the ability to think systematically and act. In addition, the development of global knowledge, mental and

physical health, and effective communication skills are also more important than ever. After research and analysis, we have abandoned the solution of building a back-end server and adopted a cloud storage service solution provided by a cloud storage service provider.

2. THE PROPOSED METHODOLOGY

2.1 The Cloud Real-Time Recording Terminal Data Sharing

Moreover, in order to reduce the risks caused by the instability of the services provided by cloud storage service providers, the clouds provided by multiple service providers are integrated, so that images can be stored and backed up in multiple clouds. Personal cloud storage is a specific application of cloud storage. It is aimed at individual users and provides users with reliable storage services, and it is no longer just the process of uploading files to the network disk. It has really entered the daily life of individuals.

It not only has the ability of network disk storage, but also has the ability to synchronize file data in real time. The implementation of the synchronization algorithm uses open source file synchronization software that is currently widely integrated in various distributions. The remote file synchronization algorithm. The algorithm is a typical single-round synchronization algorithm, and its basic idea is that the file is fixed-length chunks on the server side, and the difference between the digest values of the computation chunks is sent to the client.

Cloud storage is a cloud computing system with data storage and management as its core. It refers to a system in which a large number of different types of storage devices in the network work together through application software through functions such as cluster applications, grid technology or distributed file systems to jointly provide data storage and business access functions. Cloud storage has been supported by many companies at home and abroad, and they have launched their own products and technologies. The following is the specific situation of each company: representative state transfer) and simple object access protocol, users can call the interface to obtain services according to their actual choice. A well-developed computer infrastructure is serviced. Such as Amazon's system.

Platform as a Service. What is provided is the actual software development platform as a service and provided to users in mode. So, is the application of the pattern. However, the emergence of accelerated development also accelerates the speed of application development. Such as Google's, domestic. It is a dynamic web technology standard, advocated by the company, and established and completed by many companies. The technology is somewhat similar to the technology, the technology is to insert the program segment and markup (into the traditional web page file, so as to form the corresponding file. It is used to write the sum, thereby encapsulating the logical processing of generating dynamic web pages. Ensure data security.

2.2 The Teachers' Working Mode of Teaching Management in Colleges and Universities

It avoids the problem that traditional storage technology needs to know the specific storage information such as the specific model, interface and transmission protocol of the storage device to realize storage. As shown in Figure 1, the user only needs to know the storage information during use. The data is

stored in the "cloud", and the composition of the cloud does not need to be known to the user. If the data waiting to be processed by the operation is in the vicinity of the processing program, the machine used by the program will be efficient. This is especially true when the files are quite large. The effect is very obvious when it is huge.

This method can effectively reduce network traffic, save bandwidth and improve the data throughput of the system. Cloud computing is sweeping the world like a hurricane, and the accompanying impact is very obvious. This year is also a year of rapid development of cloud computing. Various cloud technologies and cloud applications have appeared like spring after rain. Various companies are doing researches related to cloud computing, some of which are very mature, showing huge business Potential. Relatively speaking, there have been very big changes. It has been removed, the compatibility between framework components has been reduced, and it supports common classes (which brings great convenience to module testing. It provides powerful The integration ability of , supports multiple return result types, improved tag library, and introduces the concept of expression and value search, which brings a better experience to the developer.

2.3 The Informatization of Teaching Management Mode

This paper introduces the satisfaction survey method in the evaluation process of college education informatization. The score setting of the measurement indicators adopts the Likert scale 5-point scoring method, and the teacher's satisfaction evaluation of each indicator of informatization is set to 5 grades, namely very satisfied, satisfied, average, Dissatisfied, very dissatisfied. Educational technology is the theory and practice of designing, developing, utilizing, managing, and evaluating resources and processes to facilitate learning. AECT2005 new definition states that "educational technology is the research and ethical practice of promoting learning and improving performance through the creation, use, and management of appropriate technological processes and resources.

The access layer is the layer directly contacted by the user (client), it obtains the user's application and invokes the corresponding application interface. Any authorized user can log in to the cloud storage system through the standard public application interface and enjoy cloud storage services. Since the personal cloud storage system is a platform that provides file storage services for individual users, compared with the network disk, the traditional network disk almost provides file storage and sharing services. When it first appeared, the personal network disk provided resource sharing. and storage services can meet the needs of individuals, but with the development of multimedia websites, various public resource websites have been improved. The server-side platform side receives the synchronization requests from each client, and after synchronization processing, interacts with each client and communicates with each client. Keep data in sync.

The main synchronization module is connected with the object storage system, and saves the file-type data in the object storage system; and is connected with the database, and saves the record-type data in the database. At present, most of the teaching management systems in colleges and universities are formulated by the administrators through the inspection and study of the sister colleges and the actual situation of the school, without extensive participation of the teachers and students who are under management. The results of factor analysis show that 6 principal components can be extracted

from the 34 items included in the university informatization evaluation questionnaire, and the variance explained by these 6 principal factors accounts for 69.004%. It can be judged that the extracted six common factors are ideal in fully extracting and explaining the information of the original variables.

3. CONCLUSIONS

The participation of undergraduates in the teaching management of colleges and universities is an effective means to improve the teaching quality of higher education. The overall effect of the undergraduates' participation in management on the improvement of learning subjectivity in the case is mainly manifested in: building a bridge of communication between schools and departments, and students can reflect their opinions and ideas through various organizational surveys. Continue to strengthen colleges and universities The construction of education informatization, especially the weak links such as teaching informatization, analyzes the factors that generate momentum in the group and its effective organizational form - the role of learning community in the development of teachers' ability; discusses the role of action learning in ET ability in colleges and universities The role in development and how to carry out models of action learning.

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Online Research on Basic Training of Computer Culture Based on Flipped Information System Platform

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Abstract:Aiming at the current situation of computer culture basic course teaching, the flipped classroom teaching mode based on micro-course resources is applied to analyze the teaching effect and problems. The improvement of the ability to obtain and use information will also help to cultivate students' innovative ability, inquiry ability and self-reflection Ability and the spirit of democratic cooperation are of great significance to the overall improvement of students' quality. Using research methods such as comparative experiments, through the horizontal comparison of the autonomous learning ability of the students in the experimental class and the control class and the longitudinal comparison of the autonomous learning ability of the students in the experimental class, the flipped classroom teaching mode is obtained by analyzing and summarizing. Including the design of learning resource learning activity design, learning process design, learning evaluation design.

Keywords: Online Research, Computer Culture, Flipped Information System Platform

1. INTRODUCTION

With the rapid development of informatization in various fields around the world, computer information technology education has received more and more attention and has now become an important part of the modern education system. Especially in higher vocational colleges, the basic computer culture course has become a compulsory course for non-computer majors [1]. The development of contemporary information society puts forward new demands on the cultivation of college students' information ability and information literacy. Information literacy education has become an indispensable and important content. therefore. As the cradle of talent cultivation, colleges and universities generally offer the "Computer Culture Foundation" course, which is a compulsory basic course for college students [2].

"Computer Culture Fundamentals" is a compulsory public basic course for all majors in colleges and universities. It focuses on cultivating students' practical ability. As a practical course, it is necessary to apply theoretical computer knowledge to various practices. In actual teaching [3], computer hardware experiments are limited by many factors such as venue, time, and funds [4]. The preparation of equipment before class and the maintenance of later period require a lot of manpower and material resources. It is a carrier for students to independently carry out knowledge practice activities in a digital environment. It integrates and optimizes a series of teaching links such as guidance, teaching, self-study, interaction, and practice, and constructs the whole process of teaching integration of this course [5].

The ten-year development plan for education informatization (2011-2020) pointed out that it is necessary to promote the integration of information technology and teaching [6]. Build an intelligent teaching environment, provide high-quality digital education resources and software tools, and use information technology to carry out heuristics. During the "Eleventh Five-Year Plan" period, the informatization of primary and secondary education has been carried out. Represented by "Work Exhibition and Broadcasting Platform" and "Micro Course Network" [7], as well as the recent micro-course design evaluation for primary and secondary schools in

Shanghai Minhang District, which was launched to cooperate with the Shanghai electronic schoolbag project, domestic attempts at the practical level of micro-courses have begun [8]. In 2001, the Massachusetts Institute of Technology (MIT) launched the "Open Courseware" project (OCW). The world-renowned online video open courses, Khan Academy, micro-lectures, and TED videos and other online education resources became popular. Video production and application, provide a good reference [9].

The flipped classroom is a product of the Internet information age, and it is a teaching model derived from the Internet. It was initially tried by a chemistry teacher in the United States to solve the home learning problems of some students who asked for leave [10]. They uploaded their own teaching courseware with certain audio explanations to the Internet, and the students used the Internet to learn online at home. As a practical course that emphasizes hands-on ability, the current teaching form is mostly broadcast-style "one-to-one" teaching in the computer room [11]. The teaching method is that teachers teach and students listen. This method has a large proportion of lectures.

Not every university can provide sufficient information conditions to carry out the teaching mode reform of flipped classroom, so it has to continue to use the traditional teaching mode [12]. Does it copy the "flipped classroom" model in the United States? How to understand the essential connotation of the "flipped classroom" teaching mode. The reason for the lack of autonomous learning ability of these students is firstly that the traditional teaching mode of our country makes the students' "teaching" and "learning" seriously disconnected [13], resulting in passive learning and one-sided and single method. It lacks the spirit of active learning; the flipped classroom teaching mode was first introduced and applied by Jukui Middle School in Chongqing. It is the first school in the country to implement curriculum reform using information technology strategies. Its experience in using flipped classrooms is three "flipping", 4 major links before class, 5 steps in class [14].

In 2008, David Penrose of San Juan College in Mexico [15], USA, was the first to clearly put forward the concept of

micro-lectures [16], and proposed five steps for the construction of micro-lectures. The current "Computer Culture Foundation" course evaluation does not give full play to the function of evaluation to promote students' development. There are evaluation content that emphasizes book knowledge, single evaluation method [17], and students are in a passive position in evaluation. Interactive determinism believes that individual, behavior, and environment are three Interacting factors, in which the two-way interaction between any two varies with individuals, behaviors, and circumstances

2. THE PROPOSED METHODOLOGY

2.1 The Flip Information System Platform

Teachers optimize and integrate teaching content, analyze teaching content, and build an overall knowledge structure system. The overall teaching content of the basics of computer culture is divided into basic computer knowledge overview, operating system, office automation software, and computer network foundation. An important role in the "flipped classroom" is the "micro-lecture" video. Compared with the live version, the automatic version The "micro-class" teacher's lectures are more popular with students. Students can ask the teacher to repeat the study at any time, and students do not need to consider whether it will waste the teacher's time. The direction of talent training mode is to cultivate applied talents with innovative spirit and practical ability.

Flipped classroom is a reflection of teaching ideas and a good form of teaching organization. In the process of application, it is necessary to change ideas, carefully design and organize, carefully record or select high-quality micro-lectures, and take corresponding measures. Teaching strategies can really play its role and achieve the expected results. Under the concept of "flipped classroom", learning mainly relies on students to complete the learning process before class, and the course should not be too difficult, otherwise students will not be able to complete the learning process before class. At the same time, pre-class learning needs to prepare rich resources. If students are just holding a book to read and operate, it will be difficult to carry out effective learning. When talking about computer hardware, you can go to the nearby computer market to find some promotional materials, and send them to students before the class, so that they can choose the ideal computer according to different parameter configurations. Until the establishment of "Khan Academy" (Khan.Academy).

The number of instructional videos of Khan Academy continues to increase, and the content also expands into multiple fields, and the scale of Khan Academy is increasing, and Khan and his Khan Academy have popularized flipped classrooms around the world. The flipped classroom is translated from the English phrase Flipped Classroom. Compared with the traditional classroom teaching mode, flipped classroom is a teaching mode that is fundamentally different from the traditional teaching mode. There are many definitions of flipped classroom: computer science and technology majors cultivate applied talents with innovative spirit and practical ability in accordance with the undergraduate talent training model of broad caliber, solid foundation, multi-specification, and multi-direction. At this stage, there are a series of problems such as large classroom size, many students, and uneven understanding of students in basic computer courses in universities. Especially after Zhejiang University of Traditional Chinese Medicine recruited students nationwide, the differences between provinces have become more prominent. Undergraduate students in some areas are not familiar with computers. The subject is a little unfamiliar, and I took the initiative to contact the teacher to express that it is very difficult to study this subject.

2.2 The Basic Training of Computer Culture Based on Flipped Information System Platform

At the same time, it is necessary to control the duration of each micro-class, 5 to 8 minutes is appropriate. In the process of making micro-lectures, according to the specific teaching content, the author chooses live classroom video, CamtasiaStudio screen recording software, or downloads animations and short videos that meet copyright requirements from the Internet, and reasonably organizes and presents the teaching content. The training goal of computer culture foundation course is not only to teach students to operate computers, but more importantly, to enable students to use computers to collect, analyze, process and apply information. The traditional evaluation method of basic skills of computer culture is to carry out standardized computer tests. In recent years, due to the advancement of science and technology, the application cost of virtual reality technology has dropped significantly and the functions have become increasingly rich. my country has begun to gradually carry out research and application of virtual reality.

However, the real research history is only more than ten years old. In 1996, Tianjin University used virtual reality technology to develop a virtual campus system, which opened the prelude to the application of virtual reality in the field of education in my country. The test system is added in the test center, so that students can practice repeatedly for the computer application ability test system of Tianjin Higher Vocational College, improve students' operation ability in using the test system, and at the same time enable students to experience the continuous improvement of scores after repeated practice. Happy. The computer major has strong applicability, and the practice teaching link is especially important. The quality of practical teaching directly affects students' application ability. But at present, practical teaching is a weak link in our country. Students generally lack targeted practical exercises and are unfamiliar with the working environment. Situational micro-lectures.

Scenario-style micro-lectures are rarely used in current teaching. Some teachers will edit some existing videos and other materials to add to their own teaching. However, it is difficult for teachers to record such micro-lectures by themselves. Students must master certain common basic courses, such as college English, advanced mathematics, circuit foundation, etc., professional basics and professional compulsory courses, such as C language programming.

The flipped classroom really opens up the pre-class, in-class and after-class, so that students can Get more comprehensive guidance and supervision, and provide students with a full range of teaching guidance and learning practice application platform. Especially in the basic teaching of computer culture, students have more time for independent study.

2.3 The Online Research on Basic Training of Computer Culture

Therefore, the evaluation of the basic skills of computer culture can be evaluated through the electronic works of students collected by the electronic file system, or the

evaluation of electronic works can be combined with the traditional standardized computer test. An important part of the performance of students' academic achievements collected in the electronic file system of Computer Culture Foundation Program is the electronic works produced by students. Use Virtools' action behavior module Building Block (BB) to realize specific events. BB is a set of description files that describe "how the component should act or react under certain conditions or given events". Each behavior module has its own action behavior function.

In order to better evaluate the effect of online teaching, we selected the students in Class 1 and Class 2 of Mechanical Manufacturing Automation of the 10th grade with comparable entrance scores and the students who participated in the first-level computer examination in the whole school for comparative analysis. The curriculum system is established through a long-term teaching practice process and research. It has a certain systematic and scientific nature. There are mutual connections between courses. At the same time, studying this course will pave the way for subsequent courses. Launch these three types of online "micro-course" learning resources for students to learn and compare their learning effects, understand the current situation of "micro-course" practice, and grasp their respective advantages and disadvantages. Find out the construction method of "micro-course" course resources suitable for the basic education of computer culture for undergraduates. However, the summary and reflection after class is also a very important part of knowledge learning. After class, students need to reflect and summarize their classroom learning, and further build their own knowledge system in the process of reflection and summarization. Consolidate their knowledge base and application ability foundation. The design of micro-lectures needs to be short and concise. Micro-lectures are mainly aimed at some special problems. Students can master many basic computer knowledge without micro-lectures.

3. CONCLUSIONS

The flipped classroom teaching mode based on micro-course resources can improve students' autonomous learning and inquiry ability, promote students' knowledge mastery, and strengthen students' self-awareness. The flipped classroom is suitable for the subject of computer culture, but it is not suitable for all subjects. Other subjects should be based on the knowledge system of the subject and the goals that students need to achieve. The smooth implementation of the flipped classroom is closely related to the ability of teachers. First, teachers must have excellent skills. Professional knowledge, in addition to have the corresponding teaching ability, flexible use of modern technical means to provide students with a variety of teaching methods.

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Application of CAD-Based Fractal Graphics in The Visualization Framework of Xinjiang "tukeche" Naan Stamp Design

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Abstract:With the development of the tourism industry, Xinjiang's natural scenery has been favored by many tourists. During peak tourist seasons, tourists are in an endless stream, and Xinjiang's "spit bus" has become one of the beautiful scenery. The traditional spit bus has a single structure and simple functions, and it gradually breaks away from the development of the times. Based on the CAD fractal graphics technology, this paper studies a new type of automobile structure-the Xinjiang "spit bus" naan stamp structure, which is realized by using the 3D design visualization framework of CAD graphics. The structural design, damping simulation and force analysis of Tubus, the result is optimized by 7.2%.

Keywords: CAD-Based Fractal Graphics, Visualization Framework, Naan Stamp Design, Take A Car

1. INTRODUCTION

Printing technology, this emerging high-tech product, the Internet and new energy, is called the three core technologies of the "third industrial revolution". This is considered to be after the steam age of the nineteenth century and the electrification age of the twentieth century. This is the third historic breakthrough that will lead a revolution in design, manufacturing, materials and even life in all fields of human society, allowing humans to cross the barriers of the real and virtual worlds, breaking the boundaries between technology and art, and setting off a global scale. The wave of innovation is of epoch-making significance [1-7].

For the automobile manufacturing industry, printing technology is not a new concept. Due to the limitations of computer technology, material science, Internet information and other fields, printing technology has quietly served the automobile manufacturing workshop in the past few decades. Has not been extensively developed and far-reaching influence. Until today, when there are major breakthroughs in various cutting-edge technologies, printing technology has just begun to play its huge potential and make extraordinary contributions to the further development of human civilization. Although China's automobile culture has a long history, the theory and design experience of automobile body forms are very lacking, lagging behind developed countries in the automobile industry such as Europe and the United States. Automobile is a modern industrial product. Due to its technical complexity and commercial secrets, it has caused certain limitations, making it more difficult to grasp the method of automobile body shape [8-12].

Chinese car designers want to create cars with world-class design levels. The shape language and methods of cars are problems that need to be quickly mastered and solved urgently. Today, we are in an era of perceptual consumption where natural culture is popular, and the research of bionic design is to satisfy people's emotional needs. In the field of automotive design, as a unique and widely used design method, bionic design will play an irreplaceable role. Bionic design is an excellent design method. Based on basic theoretical research, systematic method research, cognitive

psychology research, etc., after analysis and summary, some new ideas and methods that are beneficial to the bionic design of car body shape are obtained. In order to help car body shape design, the design theory we have formed through research in this area should be more systematic and innovative. The "learning from nature" and "the unity of man and nature" in Chinese philosophy are consistent with the concept advocated by the bionic design of the car body shape. That is the integration of technology and nature, and harmony between man and nature [13-18].

Bionics emphasizes the search for the balance between human and nature in the same thing. The purpose of bionic design is to meet people's physiological and psychological needs. The bionics of the car shape means that the car is full of life and vitality. The bionic design enables the form of the car body shape design has become unprecedentedly rich, and the shape bionic design is full of the infinite charm of nature, which satisfies the human yearning for nature. Through the imitation of the natural form or the capture of the instantaneous shape of the creature, the car body shape is directly inspired, which broadens the thinking in terms of practical and spiritual functions, and then through innovative practices, it promotes faster and better car body shape design develop [19-21].

With scientific development and technological progress, higher and higher requirements have been put forward for the structure of parts, and more and more parts with complex surface features have appeared. Rapid prototyping technology integrates three-dimensional CAD entities through the processing principle of layered manufacturing. Transform into two-dimensional data, perform plane processing and accumulate layer by layer to form the three-dimensional entity of the part. The forming principle of layered superposition of rapid prototyping technology ensures the smooth progress of the processing process of complex parts, but during the forming process of parts, due to layering the existence of a step effect on the surface of the part will affect the surface quality of the part, and even affect the performance of the part. The fractal theory is characterized by self-similarity, self-affine and fine structure, which breaks through the traditional Euclidean mathematics. The limitation of being able to generate regular graphics, taking the self-similarity

between the part and the whole of the entity as the starting point, it is believed that the relatively independent parts of the fractal system are to a certain extent the reproduction and microcosm of the whole, which is especially suitable for expressing traditional Euclidean Curves and surfaces that are difficult to describe in German mathematics [22-24].

2. THE PROPOSED METHODOLOGY

2.1 The Xinjiang "Take Bus" Naan Stamp Design

Based on the actual role and status of the car in real life, the car body shape design should strive to be relatively perfect, reflecting the artistry and science. Science and technology are the basis for the realization of artistic beauty. The car body shape bionic design should be based on science and technology. The prerequisite is that science and technology are the basis for the expression of bionic form, and perfect artistic expression without science and technology cannot be achieved. Therefore, the bionic design of car body form is an organic combination of science, technology and art. Realizing the beauty of any form of styling must rely on science and technology. Related scientific and technical support will ensure the diversity of morphological art design. This requires designers to innovate in the shape of the car body while meeting the existing manufacturing technology of body styling. The requirements of such a certain shape can be processed and manufactured.

Many of the styling schemes proposed in the early stage of car bionic design are very creative and meaningful. However, through understanding of the actual production process, we found that some schemes are difficult to realize their original ideas. Under the limitations of the actual manufacturing process, not all the car's bionic form can finally achieve the goal. In the bionic form design, because there are many organic curved surfaces in the form of the creature itself, this is a great challenge to the modeling design. Due to the limitations of processing technology and materials, we may not be able to fully realize all bionic designs in terms of manufacturing, which requires us to develop morphological bionic art creation on the basis of existing technology. Nowadays, body materials are constantly developing, and many new manufacturing processes are constantly being developed, which expands the space for shape bionic design, and makes the current car body shape present a rich and diversified development trend, which solves many practical problems for people. However, this is a kind of limited satisfaction. After all, the development of manufacturing technology requires a long period of time, a continuous process of practice, exploration, and development, and it is also closely related to the development of other related disciplines. Therefore, the bionic design of the car body shape should take into account the art of modeling, and considering the existing manufacturing technology and process level, we must consider the practical feasibility of various bionic shape designs.

2.2 The Automobile Design Visualization Framework

The design process of automobile exterior styling design also starts from the initial hand-drawn sketch for automobile interior styling design, as shown in the figure. The picture shows one of the application schemes of printing technology in automotive interior design. For automotive interior design, the choice of different materials, the coordination of multiple colors, the assembly of various complex parts, the interactive design of dashboards, and the human A series of issues such as the reasonable configuration of the engine system determine the extremely complex characteristics of the car interior design.

In the future, the development of printing in multi-material integrated printing and molding technology is likely to become more mature, which undoubtedly brings great convenience to the design and manufacturing of automotive interiors. With the gradual subdivision of the automobile market, the classification of functional vehicles has become more and more detailed. With the emergence of various vehicles such as commercial vehicles, RVs, and cities, although the development of interior functions is gradually improved, there are still many products. Due to the technical level and performance limitations of the production equipment, the machine itself cannot be flexibly adjusted to meet every user's use needs. Many times users can't laugh or cry when using the product, and even bring a lot of unnecessary trouble. People are always accustomed to adapting themselves to the product, but they rarely consider their subjective feelings in the process of using the product. In "Emotional Design", based on the three different dimensions of instinct, behavior and reflection, the Ph. Feeling joyful" In order to allow people to have a better product experience, technology may change this status quo. The case shown in the figure shows the research on the functional role of printing technology in future car interiors. The printing technology can realize the printing of the internal structure of the complex interior of the product, so that a certain structure cavity is formed in the wall of the car body for arranging various in-car service equipment. At the same time, it does not destroy the shape and structure of the outer wall of the car, so that the inner and outer walls of the car are integrally formed. This technological breakthrough overcomes the limitation that the traditional processing method can only be processed in sequence.

The structural optimization design of automobiles is a more mature technical means compared with other technologies. At the same time, it is also the earliest optimization technology used in various automobile lightweight technologies. As early as the 1970s, computers developed rapidly, and many new computer hardware and software were further improved. Therefore, for the first time, American automobile companies used computer software in the design of their cars. Later, with the emergence of automobile lightweight theory and corresponding computer design software.

2.3 The CAD Fractal Graphics

In recent years, fractal theory has been introduced into the field of rapid prototyping, and the use of fractal theory to optimize and improve rapid prototyping technology has provided new ideas for the development of rapid prototyping technology. At present, the application of fractal theory in rapid prototyping is reflected in the following three aspects. In Application in parts processing in the rapid prototyping process, according to the characteristics of the sliced data of the CAD model of the part, the fractal theory uses the recursive function system (IFS) algorithm to construct a square on the CAD outline, and divide each side of the square into three equal parts. Divide into 9 squares of equal area, discard the small square in the center, and then process the remaining 8 in turn to generate the layer characteristics of the Sierpinski carpet.

Then use the method of path cross-section stretching to generate a three-dimensional model of the Sierpinski carpet,

and use the RP system to process a three-dimensional entity. Due to the change of the material form during the rapid prototyping process, such as the stereolithography processing (SLA) material changes from liquid to solid In the selective powder sintering process, the materials are melted and solidified. The changes of these materials cause the shrinkage deformation and thermal deformation of the parts. Therefore, it is necessary to optimize the scanning path and reduce the influence of the processing process on the accuracy of the parts. For example, the Peano fractal curve is used to generate the scanning path. A continuous polyline connecting all the square center points in the area to construct a rapid prototyping scan path

3. CONCLUSIONS

Then use the method of path cross-section stretching to generate a three-dimensional model of the Sierpinski carpet, and use the RP system to process a three-dimensional entity. Due to the change of the material form during the rapid prototyping process, such as the stereolithography processing (SLA) material changes from liquid to solid In the selective powder sintering process, the materials are melted and solidified. The changes of these materials cause the shrinkage deformation and thermal deformation of the parts. Therefore, it is necessary to optimize the scanning path and reduce the influence of the processing process on the accuracy of the parts. For example, the Peano fractal curve is used to generate the scanning path. A continuous polyline connecting all the square center points in the area to construct a rapid prototyping scan path

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Database Course Teaching Reform Plan Based on CDIO

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Abstract: Database system principles and applications "is an important basic course for computer majors in vocational colleges, with strong theoretical and practical significance. To meet the requirements of professional training, the article analyzes the positioning and teaching content of the course "principles and applications of database systems". By combining the CDIO-OBE concept with course practice, not only can students proficiently master the basic knowledge points related to databases, but also avoid the boring psychology of students caused by dry teaching methods. Through project decomposition, team collaboration, online discussions, and micro classes, the theoretical and practical teaching links have been closely combined, improving the current experimental teaching system, and promoting the improvement of the experimental teaching level of this course.

Keywords: Database Course, Reform Plan, CDIO

1. INTRODUCTION

The course 'Principles and Applications of Database Systems' is an important foundational course for computer majors in vocational colleges, and it is also the core course of our system maintenance major. Through the study and practice of this course, students should be able to understand the basic concepts and principles of relational databases, flexibly apply SQL Server database management systems and the design and development of relational database systems and have the ability to develop database information systems. However, there are still problems in the teaching of the course "Principles and Applications of Database Systems", such as a relatively single teaching form and incomplete evaluation of teaching effectiveness. Therefore, it is necessary to introduce the CDIO and OBE concepts in this course.

As a teaching-oriented university of finance and economics, our school has been offering Access database application courses among all non-computer major students since 2009. Through experimental courses, students can better understand the basic theories and knowledge points of databases, master the methods of creating and using access databases, and lay a good foundation for them to pass the computer level exam (Level 2 exam access database subject). However, in the actual teaching process, the author found that students generally lack the engineering thinking ability to analyze and solve problems.

For this reason, we have introduced the successful CDIO education model in the field of engineering teaching in database experimental teaching. By combining the existing Blackboard online teaching platform in the school, we aim to improve students' database application abilities through database project conceptualization, decomposition, collaboration, online discussions, and micro classes. The CDIO engineering education model is the latest achievement of international engineering education reform in recent years and has become a universal model for international engineering education. The CDIO engineering education model is a concentrated summary and abstract expression of "learning by doing" and "project-based education and learning". It takes the lifecycle of products from research and development to operation as the carrier, allowing students to learn engineering in a proactive, practical, and organic way between courses. It cultivates students' engineering skills, professional ethics, academic knowledge, problem-solving

ability, lifelong learning ability, and teamwork ability to communicate and control large systems.

Taking our system maintenance major as an example, the course "database system principles and applications" is a compulsory course offered in the first semester of our sophomore year, with 64 class hours. This course mainly cultivates students' ability to manage and apply relational databases, as well as their ability to develop database application systems in combination with advanced programming languages such as JAVA. The leading courses of this course are "fundamentals of computer applications" and "fundamentals of computer programming", and the subsequent courses are "jsp dynamic website construction". The comprehensive experiment involves designing a small database system project.

2. THE PROPOSED METHODOLOGY

2.1 CDIO teaching philosophy and OBE teaching philosophy.

According to the characteristics of students in different majors, team up students to participate in a small project. Cultivate students' teamwork, communication and coordination skills, technological innovation, design and development abilities, problem-solving and problem-solving abilities in the project development process, and achieve "learning by doing". For example, a library management system can be divided into four parts: system analysis and design, database design, window design for each functional module, and integrated database system. When grouping projects, we can break down each step into multiple sub projects for different students to complete. Classroom teaching is the first stage of the entire database course teaching. We will permeate cases into every stage of classroom teaching, explain basic knowledge points based on the traditional student course selection database, and then combine the design and development of the "graduation project management system" used in practice to explain the application of knowledge points in practice.

These knowledge points include conceptual model design, standard SQL, normalization theory, database design, database programming, and transaction related content. At the same time, group teaching mode is adopted. Before the start of the course teaching, students are grouped according to the standard of 3-5 people, and each group is assigned different projects, which are sourced from the project case library.

Vocational college students have weak theoretical foundations and strong hands-on practical abilities. Although the course 'Principles and Applications of Database Systems' requires students to hands-on practice, it is not as easy to operate and has a strong visual impact as courses such as' Graphic Design' and 'FLASH Animation Production', which can greatly stimulate students' interest in hands-on practice. The course 'principles and applications of database systems' requires a certain amount of knowledge accumulation before hands-on practice, especially for the basic knowledge in the early stage, such as databases, database systems, data tables, E-R diagrams, transact-sql language basics, etc. Each knowledge point is interconnected and closely linked, requiring students to proficiently master it.

However, the repeated emphasis on key points by teachers can easily make students feel the dryness of theoretical knowledge, resulting in a lack of understanding of basic knowledge in the past and a failure to practice in the future. Therefore, in line with the CDIO concept, we have changed the theoretical class hours to 18, and the computer practice class hours to 36. We have also changed the class location from a regular multimedia classroom to an experimental teaching center computer room, where teaching and practice can be conducted simultaneously. Students can practice immediately after listening to the teacher's theoretical explanation and can keep up with the teacher's teaching thinking and have enough time to independently think and practice, avoiding the situation of disconnection between the class content and the computer experiment. The experimental content and course design content conducted by each group are related to the assigned projects, and they are different from each other. The experiments are divided into validation experiments and comprehensive design experiments.

The specific process is as follows: Firstly, the teacher releases task requirements, allowing students to first understand the task objectives completed by the project and understand the implementation ideas based on the objectives. Observe the performance of each student throughout the entire semester, including learning attitude, work and professional ethics, teamwork spirit, communication and expression abilities, and organizational and coordination abilities, and conduct a professional ability assessment. Based on the projects made in the course design, the project assessment scores are given. These two items account for 70% of the total assessment score in the regular exam, and 30% of the total assessment score in the final exam. This provides the overall evaluation or overall assessment score of the students.

2.2 Construction of Database Practice Teaching System Based on CDIO

The former involves the basic knowledge of knowledge points, so each member of the group is required to complete it independently; The latter is the comprehensive application of the learned knowledge points, so team members need to work together under the coordination of the team leader. To avoid duplication in experimental and course design content, we will combine the final comprehensive design experiment with course design. At the end of the course, we will complete the database design and implement the specific functions of the system in the course design starting from the next semester.

This can achieve an organic combination of experiments and course design. The course 'principles and applications of database systems' is guided by the obe concept when setting teaching objectives, which can effectively evaluate teaching outcomes. The objectives of this course mainly include two

aspects: ability objectives and quality objectives. Among them, the ability objectives mainly include that according to the requirements of the talent position, students should be able to install, debug, and maintain SQL Server databases; Design the database according to project requirements; Writing and debugging relevant Transact-SQL statement codes; To improve students' learning efficiency, we have also introduced popular micro lesson videos on the Blackboard platform to achieve data integrity through constraints, indexing, and other means.

In specific teaching, the content taught in micro courses is in a "point" shape and fragmented. These knowledge points can be knowledge interpretation, problem exploration, and key point induction; It can also be a knowledge explanation and demonstration of skills such as method teaching and teaching experience. It is short and powerful, able to meet students' learning needs anytime and anywhere, and fully utilizes students' leisure time, allowing them to use fragmented time to grow knowledge. As mentioned earlier, each group is assigned corresponding projects and then divided into groups for homework, experiments, and course design. The smooth implementation of these measures has put forward strict requirements for teachers. Each teacher needs to be very clear about the overall situation of each project, and plan the homework content, experimental content, and course design content for each project at each knowledge point before teaching.

In practice, we build these contents into a case library and enrich the accumulated new cases into the case library at the end of each semester. The acquisition of new cases in the case library mainly comes from students' practical training projects, teachers' own projects, and simulation projects of cooperative enterprises. Design stage: this stage is based on the results of the conceptual stage and adopts modular thinking to design the "product sales database" conceived. The design process includes the requirements of the product sales database, the E-R diagram design of the database, the storage capacity and location of the database, and the design index. This stage is conducted through grouping, with 4-6 students in each group and one group leader for each group.

3. CONCLUSION

Integrating the CDIO-OBE concept into the teaching of "Database System Principles and Applications" not only enables students to proficiently master the basic knowledge points related to databases, but also avoids boring teaching methods that may cause students to become bored with the course. Improved students' ability to think systematically and independently solve problems. The experimental course of this course has become a national planning textbook for general higher education due to its effective use. At the same time, based on the BB network teaching platform currently used by our school, we have also made some beneficial attempts. Based on integrating online teaching resources, new methods such as mobile learning are used to deepen students' understanding of teaching content, stimulate their interest in self-directed learning, and cultivate excellent talents with solid theoretical and practical abilities.

4. ACKNOWLEDGEMENT

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Research on the Cultivation Model of Applied Art and Design Talents Based on the Integration of Industry and Education

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Abstract: The integration of industry and education is the driving force and goal of the development of vocational colleges, the key to solving the structural contradiction of talent demand, and the objective requirement to improve the quality of talent cultivation. At present, there are still problems in the talent cultivation of art and design majors, such as low matching between talent supply and enterprise demand, insufficient close cooperation between schools and enterprises, and a single form of integration between industry and education. Exploring the construction of an applied art and design talent cultivation model, specific measures include establishing a composite teaching team, deepening the construction of professional connotation, highlighting the combination of "Taoism and technology" and "three equal emphasis" in talent cultivation, and achieving "four changes" in teaching reform and curriculum system construction.

Keywords: Cultivation Model, Applied Art, Design Talents, Industry and Education

1. INTRODUCTION

The integration of industry and education is a powerful guarantee for higher vocational education to cultivate talents, assist regional economic development, and promote industrial upgrading. The new vocational education law implemented on May 1, 2023, clearly states that "vocational schools and vocational training institutions should focus on the integration of industry and education, and implement school enterprise cooperation in implementing vocational education". Among them, the term "integration of industry and education" has replaced the previous "integration of industry and education" in the vocational education law. Although there is only a one-word difference, it has a deeper meaning. 'Integration' focuses more on surface connections, while 'integration' refers to the deepening of industries and education, forming a new system.

Firstly, the art and design industry serve as a service object and partner for education. Under the educational concept of integration of industry and education, the purpose of education is to provide more applied talents that meet the development requirements of the art and design industry to enterprises, so the art and design industry is the service object of education; At the same time, the integration of industry and education requires enterprises to always pay attention to the talent cultivation process and provide sufficient assistance to schools. From this perspective, the art and design industry are also a partner in education. Secondly, the integration of industry and education shapes professional characteristics and enhances students' professional abilities. Connect with new technologies in the industrial chain and develop school enterprise cooperation courses.

Reform the talent cultivation plan, establish two directions in the field of visual communication design: brand image design and promotion, and cultural creative design, and form new courses such as "innovative design of intangible cultural heritage", "tourism souvenir design", "brand market research", "brand planning", "brand image design", "brand display and promotion", "brand management", "cultural tourism market research", and "cultural tourism planning creativity" to connect with the cooperative enterprises of the college, develop cultural and creative design and brand promotion, collaborate on the development of school enterprise collaborative courses, jointly cultivate students, and sort out course characteristics and achievements, and publish practical course textbooks. Art and design mainly focus on creativity and design. With the continuous progress of technology, the cultural and creative industry gradually integrates with the Internet and the Internet of Things, and integrates virtual reality technologies such as AR, MR, and VR, enabling product design to develop from two-dimensional visual graphics to interactivity.

The integration of the cultural and creative industry with the new generation of information technology has expanded the demand for technical and skilled talents in the design industry, and the cultural and creative industry has also entered a period of rapid development. The demand for enterprises brought about by industrial upgrading also develops with changes in the market, especially influenced by technological changes and technological updates. Enterprises urgently need composite technical and skilled talents with high aesthetic literacy, able to master new technologies and processes, and meet the needs of the information age. However, the author found through research in multiple vocational colleges that the hardware equipment and teaching content of many schools cannot keep up with market changes, and the software and hardware facilities are severely lagging compared to enterprises, resulting in the quality of talent cultivation in schools unable to meet the employment requirements of enterprise positions. The development characteristics of each art and design industry are different, so under the educational concept of integrating industry and education, it is more conducive for schools to shape their professional characteristics.

2. THE PROPOSED METHODOLOGY

2.1 The necessity of integrating industry and education in art and design majors

For art and design majors, the integration of industry and education can further demonstrate the perfect combination of "art" and "design", with theory and practice running parallel. Students can take their professional knowledge and skills to the next level. Thirdly, the integration of industry and education is an effective way for schools to cultivate applied art and design talents. With the power of the art and design industry, schools can obtain richer social resources (most importantly, teaching staff and practical training environment), thereby further improving the educational level of the school. Strengthen the guidance of teachers' professional education ideas, attach importance to the training of professional skills from an ideological perspective, and actively participate in the training of professional skills. Encourage teachers to actively participate in the construction of experiments and training rooms, as well as the development of new experiments and training projects. Actively apply for scientific research projects with enterprises, participate in project design, and seek comprehensive graduation practical projects for students from production practice. Implement a "studio system" to provide more teachers with the opportunity to lead students in professional work such as product design and development.

Collaborate with schools and enterprises to carry out horizontal research on folk art intangible cultural heritage projects and self-media projects, and jointly carry out guidance on college student entrepreneurship training programs and research on educational reform topics. Schools, enterprises, industries, etc. jointly plan projects and topics, and implement project-based teaching through the model of order-based training. For example, the School of Art and Design of Guangzhou Panyu Vocational and Technical College, through the model of jointly building core professional groups between schools and enterprises, carries out order-based training for industrial parks, and cooperates with industrial parks including China Leather Industry Cultural and Creative Park, Shenzhen Intelligent Wearable Products Industrial Zone, and Dongguan Digital Products Industrial Zone to jointly educate people. The new products jointly developed by students at this school and enterprises through practical courses have entered the export market. Establish a composite teaching team composed of schools and enterprises. Composite teaching teams have multiple advantages.

School teachers have professional theoretical knowledge, while enterprise trainers have rich work experience. The combination of the two can jointly promote the improvement of students' comprehensive abilities, which is more conducive to cultivating applied art and design talents with equal emphasis on theory and design. Therefore, schools and enterprises should strengthen cooperation and cultivate composite teaching teams. Enterprises should regularly select excellent trainers to give lectures at schools and actively exchange teaching experiences with schoolteachers.

Firstly, talent cultivation should emphasize both theory and practice. Based on the platform of the base, the project as the carrier, and the product as the goal, the enterprise production process is introduced in the teaching process. Student works are planned, developed, and produced completely according to the enterprise's standards, achieving effective integration between works and products. A mechanism for large-scale output and transformation of teaching results is established, so

that art and design education directly serve the industry and industry. We will gradually form a practical experimental teaching model and mechanism in the new system of practical teaching, with scientific and improved aspects from platform, content, management, to evaluation standards.

2.2 Reforming teacher training and practical teaching mechanisms

Closely focusing on the integration of industry and education, expand the professional group of "platform courses specialized courses plus practical courses", and achieve professional sharing, school enterprise sharing, and market sharing. Implement online teaching of design basic courses through the platform, establish a resource library, and achieve resource sharing. Conduct product design and development through specialized courses, integrating product development with enterprise needs; Through practical training courses such as on-the-job internships, graduation design internships, and innovation and entrepreneurship practical exercises, students can achieve employment and entrepreneurship. The equal emphasis on theory and practice is the main characteristic of applied art and design talents. Therefore, under the concept of integrated education between industry and education, schools and enterprises should not only cooperate with each other but also have a clear division of labor. The main task of schools is to cultivate students' theoretical knowledge, while the main task of enterprises is to provide students with an excellent practical training environment to enhance their practical abilities.

Implement three 'improvements'. Firstly, the teaching philosophy needs to be improved. Reforming student-centered and results-oriented "studio based" teaching. The reform of practical teaching has shifted from "content oriented" to "student oriented". In traditional teaching, teaching content exists before teaching objectives and occupies a core position; In the context of the integration of industry and education, the "studio system" teaching prioritizes students' expected learning outcomes based on the teaching content, and activities such as project resource development, student management system (credit exchange, rural activities, social practice, labor education, etc.), and tutoring (tutorial system) should be carried out around the expected goals. Taking the school enterprise cooperation base as the platform, the real projects of the enterprise as the carrier, and the goal of designing market recognized products and works, the production line of the enterprise is connected to the specialized courses in the teaching process. According to the marketing, design, and construction processes of the enterprise, corresponding to the real teaching projects, the products and works are effectively connected, completing the transition and transformation from platform courses to specialized courses, enable schools and enterprises to achieve a "win-win" situation.

On the practical course platform, students go to enterprises for graduation projects and on-the-job internships. During the internship, students' graduation project topics should be based on the most popular projects in the market, assisted by enterprise mentors to complete, and ultimately form enterprise achievements. We must deeply implement the people-oriented development concept, actively practice the student-centered teaching philosophy, effectively fulfill our educational responsibilities, and be responsible for the future development of students and the healthy development of the art and design industry.

Secondly, the teaching environment needs to be improved. Further enhance the diversity and artistry of the teaching environment, subtly enhance students' artistic cultivation, and strengthen the teaching of cultural courses. Finally, the teaching content needs improvement. The teaching content should meet the basic requirements of the development of contemporary art and design industry. The school level is composed of the academic affairs office and the teaching supervision group. At the departmental level, the leadership of the college is responsible for the division of labor, with specific coordination by teaching management personnel and participation of enterprise mentors in the evaluation; Pay attention to the work of basic teaching and research rooms and laboratories (studios); With students as the main body, it is ultimately implemented at the level of practical teachers and experimental technicians.

3. CONCLUSION

In summary, the educational concept of integration of industry and education not only includes the advantages of traditional university education models, but also incorporates many excellent social resources such as enterprises and groups, greatly expanding the content of art and design education, strengthening the faculty, and cultivating more and better applied art and design talents for society.

4. ACKNOWLEDGEMENT

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Research on the Theoretical System of Value-Added Evaluation of Comprehensive Ability of Vocational College Students in the Context of Smart Education

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Abstract: Smart education is an educational term based on the informatization of education. The essence of smart education is to apply modern information technology methods to the field of education and use these advanced technological means to assist in completing the process of teaching reform and innovation. The technological characteristics reflected in smart education are the digitization, networking, and intelligence of traditional educational resources, methods, and methods to achieve maximum resource sharing and collaboration. A talent quality evaluation system is a beacon to guide students in what direction to strive for, and a detector to test teaching level, quality, and style. According to the characteristics of the training objectives of vocational and technical colleges, set up quality evaluation indicators for college students and construct a comprehensive evaluation system.

Keywords: Theoretical System, Value Added Evaluation, Comprehensive Ability, Vocational College Students, Smart Education

1. INTRODUCTION

With the deepening of the Education reform, the industrialization of vocational and technical education and the socialization of college life have become an inevitable trend. College students are the main body of higher education, and the evaluation of their quality plays a very important role in shaping their behavior and cultivating their own quality. What kind of evaluation goals and standards there are, will produce what kind of thinking and behavior. It can be said that a talent quality evaluation system is a beacon to guide college students in what direction to strive for, and a detector to test teaching level, teaching quality, and teaching style. At the same time, it promotes the atmosphere of learning It plays a very good role in standardizing students' behavior and guiding students to become talents. According to expert research, secondary vocational school students tend to think in images as their intellectual types. Although their ability in logic and mathematics is weak and they are not good at Abstraction logical thinking such as reasoning and deduction, they are good at learning procedural knowledge directly and figuratively and have outstanding ability in absorbing and internalizing practical technical knowledge.

In view of this, the evaluation of the comprehensive abilities of vocational school students cannot adopt the evaluation model of general education, which uses exam scores as the main evaluation element to conduct a result-based evaluation and recognition of students' comprehensive abilities. Constructing a scientific and effective evaluation system for students' comprehensive quality education is an inevitable requirement for cultivating high-quality workers and technical skilled talents with comprehensive development in morality, intelligence, physical fitness, aesthetics, and labor. A scientific evaluation system has a guiding function and is a "baton" to guide students' behavior; Having the function of evaluation, it is an effective material for students' growth and quality during their school years. At the same time, it also has a management role, which can facilitate the school management to timely understand the overall situation of students and carry out targeted reforms and practices. Vocational education informationization teaching ability refers to the ability to use modern information technology resources and means to complete daily teaching activities and tasks.

This is a new requirement for vocational education teachers in modern vocational education, and it is necessary for vocational education teachers to adapt to the improvement and development of professional abilities. The indicator system should comprehensively reflect the entire process of students' growth during their school years and the overall characteristics of their formation and can reflect the quality status of students from multiple levels, perspectives, and mainlines, to ensure that the evaluation results comprehensively, comprehensively, and accurately reflect the quality of college students and the effectiveness of vocational quality education activities. The curriculum system of secondary vocational education directly points to the cultivation of vocational abilities. Students' participation in curriculum learning is not for the physical accumulation of knowledge, but for the acquisition of the necessary abilities for engaging in vocational activities. Therefore, process evaluation based on vocational contexts is particularly important.

The growth of students' professional abilities follows the development law from technology to skills, and then to skills. The sequencing of the vocational education curriculum system must be guided by the growth law of professional abilities. The evaluation content is simple and one-sided, and the system structure is not yet perfect. Vocational education mainly cultivates high-quality workers and skilled technical talents, requiring students to fully learn and improve their theoretical knowledge, practical skills, and professional qualities. At present, there is a phenomenon in various vocational colleges that attach importance to academic performance while neglecting other aspects, and the evaluation content is relatively simple and one-sided. Many vocational colleges' evaluation systems still need to be improved, and the evaluation content needs to be fully discussed and assessed.

2. THE PROPOSED METHODOLOGY

2.1 The Current Situation of the Comprehensive Quality Education Evaluation System for Vocational College Students under the Background of Smart Education

In the context of smart education, the ability to obtain, organize, and share professional information is one of the essential abilities for modern vocational education teachers. From the average level of this ability among vocational education teachers in China, it still shows a low level. According to statistics, most vocational education teachers nowadays can obtain some professional education resources through certain means but cannot achieve precise and high-quality access to targeted resources. Therefore, there is a certain lack of rapid and efficient access to professional teaching resources. The level of classification management for the obtained resources is relatively low, and it is not possible to establish one's own digital teaching resource library in a timely and effective manner, which directly leads to poor effectiveness of information-based teaching.

From this, modern vocational education teachers need to improve their ability to access and organize professional information resources. Motivation is the stimulation of behavioral motivation, and the fundamental purpose of an evaluation system is not to distinguish students from good or bad, but through evaluation, the evaluation object clarifies their direction of success through affirmation or negation and strives to improve their own quality. By affirming excellence, students' enthusiasm for success is further stimulated, and at the same time, it motivates the underachievers, causing mental pressure on the evaluators. By summarizing, reflecting, and comparing horizontally and vertically, the pressure is transformed into motivation, which can easily create a positive and upward atmosphere among students, striving to become successful, and catching up with the advanced. Especially, it plays a great promoting role in the formation of a good school spirit and academic atmosphere.

Integrate professional guidance theoretical knowledge and practical skills into the process of professional activities, and conduct integrated evaluation, that is, with "action oriented" and professional work tasks as the reference frame, to assess and evaluate the guidance theoretical knowledge and practical skills required to complete a specific work task in a specific work context. The evaluation of comprehensive quality education should revolve around the goal of cultivating talents with comprehensive development in morality, intelligence, physical fitness, aesthetics, and labor. It should be included in the talent cultivation plan. Based on the characteristics of the teaching process and training stage, campus culture and quality expansion activities should be scientifically designed. Multiple assessments should be conducted on students from various aspects such as knowledge, ability, and quality. At the same time, while paying attention to the common performance of vocational students, the promotion and encouragement of students' individuality should be promoted. Among the above evaluation indicators, some are hard indicators that can be represented by clear quantitative relationships.

2.2 Strategies for Constructing a Value-Added Evaluation System for Student Comprehensive Quality Education

Petri net is an effective tool to describe the Discrete event for example, professional course grades in professional competence are mostly quantitative indicators. Some are soft indicators, also known as qualitative indicators, which focus on reflecting the degree of their impact on comprehensive quality evaluation from a qualitative perspective. For example, the political direction in ideological and moral education needs to be given different scores based on individual students' situations, and qualitative indicators should be quantitatively transformed. Vocational education, which takes the comprehensive development of people as its own responsibility, not only cannot do without cultural courses, but also should attach importance to cultural courses and their value orientation. The fundamental reason for the emergence of the "useless cultural curriculum" among students is that the current value orientation of cultural curriculum does not meet the requirements of students' professional ability growth.

Indeed, vocational education is competency based and employment oriented. The value orientation of cultural courses should be directed towards the cultivation and improvement of students' professional abilities, and towards facilitating their future employment needs. Only by realizing the important significance of cultural courses from these two aspects can students have value identification with cultural courses. Building an information platform is an important support for establishing a comprehensive quality education evaluation system for students. Based on the evaluation content and indicator system of comprehensive quality education, the four core values mentioned above are subdivided into several evaluation points according to the training objectives, and corresponding assessment scores are given to each evaluation point. Finally, the comprehensive quality education score of students is obtained by summarizing.

The information platform should be granted corresponding permissions based on the different responsibilities of relevant personnel, achieve full coverage of all evaluation points, and be able to complete real-time online input and query functions for students' participation in quality education activities. After the established process of review, it can provide real-time feedback on students' scores and rankings. Under the background of smart education, vocational education is fundamentally a transformation of educational methods compared to traditional vocational education. In the current stage of information technology education, vocational education teachers need to make corresponding changes in their concepts, design of various teaching links, and design of experimental or practical courses. This is the primary prerequisite for fully completing an information technology teaching course.

From the perspective of the current level of vocational education teachers' ability in information-based teaching design, most teachers can find and apply corresponding digital resources for their courses through information technology but cannot independently design more targeted and specialized digital teaching resources. In addition, there are also some deficiencies in the diversification of teaching means. The design ability of MOOC, micro class design, flipped classroom design and other aspects is generally low, which will directly lead to the inability to fully apply

information technology to daily teaching design. For soft indicators, i.e., qualitative indicators, the scoring method should be used for quantification first, and then the relative score should be calculated using a formula.

3. CONCLUSION

Based on the vocational ability training objectives of secondary vocational education and the architecture of its curriculum system, the evaluation of students' comprehensive abilities should be systematically evaluated from four aspects: cultural basic knowledge, professional theoretical knowledge, professional skills, and professional literacy. Different types of ability structures have different requirements in different vocational activities, so different evaluation methods, evaluation media, and evaluation standards should be adopted, and the evaluation results should be flexibly processed. It is imperative to establish a scientific and effective evaluation system for students' comprehensive quality education. Each vocational college should continuously revise and improve the evaluation system based on the actual situation of the college, to provide an inexhaustible source of power and energy for the comprehensive development of students.

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