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On Henri Lefebvre's Theory of Space Production and its Practical Significance

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Abstract: Henri Lefebvre is a representative figure of Western Marxism, and the space theory is one of his representative theories. This article adheres to the principle of the unity of history and logic. Based on the analysis of the texts of Lefebvre's space production theory, it mainly combs the main content of Lefebvre's space production theory. Then, combining the current situation of China's economic and social development, it analyzes the practical significance of the theory.
Keywords: Lefebvre; Space production theory; Practical significance

1. INTRODUCTION

Henri Lefebvre is a representative figure of Western Marxism, and the space theory is one of his representative theories. This article adheres to the principle of the unity of history and logic. Based on the analysis of the texts of Henri Lefebvre's space production theory, it mainly combs the main content of Henri Lefebvre's space production theory. Then, combining the current situation of China's economic and social development, it analyzes the practical significance of the theory.

2. ANALYSIS OF THE SPACE CONCEPT OF LEFEBVRE

The voltage pulse sequence signal is amplified linearly to 0-2V for A/D sampling. For small amplitude and wide bandwidth, the requirement of the amplifier is relatively high, the low noise and broadband is considered.

(1) The design of programmable amplifier

In the daily life, we are no stranger to the word "space". But for the average person, it is usually a concept in the field of natural sciences such as geography, physics, and mathematics, etc. However, in the theoretical context of Henri Lefebvre, "space" refers to the place where production relations are reproduced [1], or can be understood as a spatialization of social order [2]. Thus, in Henri Lefebvre's view, "space" is no longer a concept in the field of ordinary natural sciences, but a concept of social productiveness in the field of philosophy. In addition, he also proposed that space arises from labor and division of labor [3], the social space is the product of society [4]. These two sentences show his views on the origin of space. In his view, space is not produced out of nothing or imagination, but the result of social production. Based on the above related expressions of Henri Lefebvre, there can be a conclusion that space is not only a historical result of social production and production relations, but also a social basis or premise of social production. In a sense, the relationship of production is a social existence in the sense of spatial existentialism. The space lay itself in the social space, leaving its trace in the social space while conducting space production. Otherwise, it is an abstract existing objective. Space is not an abstract natural object, ontology or an abstract psychological form, but an embodiment of production relationship that is its maternal. In short, in Henri Lefebvre's view, space is both a prerequisite for social production activities and a result of social production activities. In other words, social production takes place in space, and social production produces new spaces in addition to other products.

(2) Characteristics of the concept of space

The concept of space has a dialectical feature that is both concrete and abstract, as the concept "exchange value" Karl Marx referred to. It is not only a product of production, but a concrete material entity. That is to say, it is the external materialization of human labor, and an abstract compression performance of social production relations. This specific abstraction is both a place for social production activities and a product of social production activities. In other words, it is both the result or product of socially productive activities and the premise or means of production activities.

3. THE MAIN CONTENT OF HENRI LEFEBVRE'S SPACE PRODUCTION THEORY

(1) Main rules of space production

Regarding space production, Henri Lefebvre has proposed the following four rules [5]:

First, the material or the natural space is disappearing

The space alleged by Henri Lefebvre is the premise and result of social production, and it is a social space. As social production continues, new social spaces will continue to emerge. As a result, the natural space gradually disappears. That is to say, with the production of space, more and more natural space will be transformed into social space, and there will be less and less natural space that is not branded with human activities. In other words, the continuation of social space production will lead to the expansion of social space and the disappearance of natural space.

Second, every society or every kind of production method will produce its own space

On the one hand, space is the product or result of social production. While producing other products, social production will inevitably produce space that is compatible with its own social economic form or production mode. On the other hand, space is also a prerequisite or means for social production. Therefore, any society or any production mode must produce its own space. Otherwise, the social production corresponding to this society or this production mode will be difficult to sustain and expand. Moreover, this society or this production mode will not be able to continue to exist and develop. Therefore, it can be inferred that any society, any kind of production mode, will produce its own space. This is determined by the dialectical unity of space and social production. In another sense, this rule also shows that space has social historical characteristics, and specific space always correspond to specific social form and production mode.

Third, from focusing on "things in space" to focusing on "production of space"

Henri Lefebvre proposed the theory of space production, and its theoretical interest is to hope that people will pay attention to "the things in space" instead of the "production of space". Of course, this rule also indicates its rewriting or revision of some previous theories. The previous theory pays more attention to the things in the space at the micro level, but just ignores the space and its production itself. Henri Lefebvre proposed this rule, hoping that people will grasp and understand the space as the premise and result of social production from a more macro perspective. In his view, facing the situation that the things in the space of daily life tends to symbolize and systematize, the production of space has more theoretical value and significance than the things in space. On the other hand, this rule also gives us a theoretical path to understanding Henri Lefebvre's space theory.

Fourth, if each production mode has its own unique space, then moving from one production mode to another will inevitably accompany the production of new space

Space is the result or product of social production and corresponds to a certain production mode. That is to say, space is a representation or reflection of the production mode. Then, a particular space must be the product of a particular social production, and corresponds to a specific production mode. In other words, a particular space is a representation or reflection of a particular production mode. Therefore, the change of production mode is bound to be accompanied by the change of space, which is bound to accompany the production of new space. That is to say, one production mode is transferred to another production mode, which is inevitably accompanied by the production of new space. For example, the transition from capitalist production mode to socialist production mode is bound to accompany the production of socialist space.

(2) Historical mode of space production

In the fourth item of Lefebvre's rules on space production, it is mentioned that "moving from one production mode to another is inevitably accompanied by the production of new space". So, what is the emergence of the new space? Concerning this problem, Lefebvre proposed the historical mode of space production, which is the concept of "L'histoire de l'espace" in the book "The Production of Space", thus solving the historical staging problem of space. Specifically, the main connotation of this concept is that the spatial history of human beings has experienced and existed the following forms:

First, absolute space

Absolute space is nature, it is the birthplace and prototype of all kinds of space. The absolute space here can be understood as the "free nature" that Karl Marx referred to. That is to say, it is the natural space of the original ecology without human intervention or destruction. With the continuous expansion of human activities and the deepening of the detection and development of nature, the absolute space is gradually disappearing.

Second, sacred space

The sacred space refers to the city state, the tyrant and the sacred king, and the ancient Egyptian dynasty. In a certain sense, the sacred space is equivalent to the early slave society. In the sacred space, religion has great influence and control over the entire society and all people. Even in some countries and regions, there is a tendency of religious gods being united with secular regimes. In the sacred space, the mode of social production is mainly manual production, and the materials of production are privately owned by the slave owners.

Third, historic space

The historical space refers to the political state, the Greek city-state, the Roman Empire, etc. It is a kind of perspective space. From the perspective of social form, the historical space is equivalent to the historical period of a relatively mature slave society or the feudal society. In the historical space, religious theocracy and secular power are basically divided into two different social systems, although the influence and control of religion on the whole society and the all people are still very great. In the historical space, the mode of social production is still mainly manual production, and the means of production still belong to the slave owner or the feudal manor.

Fourth, abstract space

Abstract space refers to the political and economic space of capitalism, property, and so on. From the perspective of social form, abstract space will be equivalent to capitalist society. In capitalist society, the social production mode is the socialized large-scale production, and the ownership of production materials is capitalist private ownership. The contradiction between the above two is the basic

contradiction of capitalist society. The abstract space is the power tool of the capitalist state. As a bourgeoisie of the capitalist state, the bourgeoisie uses abstract space to consolidate its dominant position. On the other hand, it uses the power of abstract space to control the expanding space. The abstract space is the object mainly criticized by Henri Lefebvre.

Fifth, contradictory space

The contradictory space refers to the contradiction between quality and quantity, the contradiction between the use value and the exchange value, and the opposition between contemporary global capitalism and local significance. This contradictory space can't simply be compared to a particular social form, such as a capitalist society or a socialist society. The significance of this concept is to reveal some contradictions in the global social production and economic life in the process of globalization dominated by contemporary capitalist countries. Of course, these contradictions are brought about by the capitalist production mode.

Sixth, difference space

The difference space refers to the space in the future that can reflect differences and fresh experiences. In a sense, this is equivalent to the primary stage of communism - a socialist society. The reason is that the socialist society focuses on the production and reproduction beyond the abstract space of capitalism, and the homogenization of abstract space for everyone and the daily life. To a certain extent, in the process of strengthening differences, people are freed from the control of abstract space and thus get freedom in daily life. The production mode of the difference space is mainly the socialized large-scale production based on the public ownership of production materials, and the distribution according to work is implemented.

To a certain extent, the historical way of space or the concept of historical space is Henri Lefebvre's spatial rewriting of Karl Marx's theory of economic and social form as well as the critical imitation of Heidegger's view of existence. Besides, it is an important part of Henri Lefebvre's theory of space production.

(3) Space production and social form

First, every social form must produce the corresponding social space

Lefebvre pointed out that just as every social form has its own corresponding social space, a socialist society must produce its own space. This statement has three implied meaning in the recent social and historic situation: First, each social form has its own corresponding social space. Second, the corresponding social space owned by each social form is not fictional or imagined, but produced by the society itself, which is the product of social production. Third, as a new social form, the socialist society doesn't have or seldom has a social space corresponding to itself yet. Therefore, it must create a space of its own by the production of its own social operating mechanism, thus supporting its own survival and development. Thus, through logical extended reasoning and abstract analysis, the general conclusion that can be drawn is that each social form must produce a corresponding social space for itself. The production of space is especially necessary and crucial for the socialist society which is an emerging social form.

Second, the change of social form is premised on the production of new space

Henri Lefebvre pointed out that if a suitable space isn't be produced, then "changing lifestyle" and "changing society" are impossible. In order to change the daily life, the space must first be changed. In other words, changing the space is the premise and prerequisite for changing the daily life and changing the society. Changing the space means producing new space. Because space is not fictional or imagined, changing space means that new space must be produced. From the perspective of historical materialism, the change of the lifestyle and society also means the change in the social form. That is to say, the change of the social form must be based on the change of space, and the change of space means the production of new space. In other words, changes in the social form are premised on the production of new spaces.

(4) The ultimate goal of space production

In the view of Henri Lefebvre, the ultimate goal of space production should be to "produce the space in which human beings exist... a global space as a social basis for transforming everyday life".[6] From the perspective of theoretical analysis, the space in which human beings exist has great similarities with the communist society proposed by Karl Marx. The ultimate goal of the communist society is to eliminate the private ownership represented by capitalist ownership, to eliminate the alienation brought about by the operation of capitalist economy, to eliminate the social class differences, urban-rural differences, and the differences between mental and physical labor, and finally establish an union of free people, thus realize the free and comprehensive development of human beings. That is to say, the highest value goal of the communist society is to return people to their natural, purely class nature, to realize their free personality, and to live freely in the world as a kind of existence. Henri Lefebvre proposed to produce the space of human existence in the world, and use it as the social basis for transforming the daily life, whose theoretical point is to criticize and transcend the abstract space of capitalism, and to establish a social space that conforms to the nature of human beings and adapts to the existence of human beings for the free survival and development of human beings, so that people can live in the world as a kind of existence that returns to the nature of their own class. In a sense, Henri Lefebvre's above opinion has similarities with

establishing a communist society. To a certain extent, the ultimate goal of space production—the production of the space in which human beings exist—is the preparation for space production in order to establish a communist society, or the space production for communism. In other words, to some extent, the ultimate goal of space production is equivalent to establishing a space for communist society around the world, thus providing the foundation and premise of political geographical space for building communist society and realizing a communist lifestyle. In a sense, the ultimate goal of space production proposed by Henri Lefebvre is a spatial rewriting of the great ideal of communism put forward by Karl Marx, or a political geography strategy or a spatial practice path for realizing communist society.

4. THE PRACTICAL SIGNIFICANCE OF HENRI LEFEBVRE'S SPACE PRODUCTION THEORY

Although Henri Lefebvre's theory of space production is focused on the criticism of contemporary capitalism, it also has certain practical significance for the current economic and social development in China. The details about its significance are as follows:

(1) To integrate into globalization, actively respond to the spatial expansion of capitalism, and defend the living space of socialism with Chinese characteristics

At present, the globalization process led by the capitalist production mode and its material carrier (the capitalist state) is still in full swing. The capitalist production mode is still expanding extensively and deeply in the world. Driven by the pursuit of value-added nature, the capital almost pervasive and invades any profitable country or region, thus encroaching and compressing the living space of these countries and regions' own production mode and social systems. At the beginning of reform and opening up, in order to solve the problem of serious insufficient funds in China's domestic economic development, and thus promote the development of the domestic economy, foreign capital was actively introduced and utilized by China, thus foreign capital has also naturally entered into China's domestic economy. By now, the amount of foreign capital operating in China's domestic economy has been very huge and alarming. The effect of these capitals on China's economic and social development is two-sided. On one hand, they solved the problem of insufficient funds for domestic economic development in the past special historic period, which contributed to the rapid development of China's economy to a certain extent. However, on the other hand, they also encroached the cornerstone of China's socialist system (China's public capitals), squeezed the living space of China's public capitals and civil capitals, thus posed a certain threat to China's economic security. So far, many industrial sectors in China's domestic economy, especially those related to people's daily life, are controlled by foreign capitals, which is posing a threat to the people's daily life. Globalization is an unstoppable historical trend driven by foreign capitals, and we must actively integrate into it. At the same time, we must also actively respond to the spatial expansion of capitalism, and we must strengthen the supervision of foreign capitals in domestic operations. In addition, we must actively implement the "going out" strategy and actively produce and expand China's social living space. From this perspective, the "One Belt, One Road" construction that China is currently implementing has a very important and far-reaching significance, because it can expand the social living space of socialism with Chinese characteristics.

(2) To maintain the pursuit of the ultimate goal of space production, and to strengthen the great ideal of communism

Henri Lefebvre's ultimate goal in space production is to "produce the space in which human beings exist... a global space as a social basis for transforming everyday life" [7]. This goal is mainly based on two problems: One is the alienation of the survival of human beings and the whole society caused by the production of abstract space in capitalist society, the other is that the capitalist society is concerned with the homogenization control of the daily life space of human beings. That is to say, the ultimate goal of space production is to go beyond the abstract production of things and space in capitalist society and produce the space for human beings existence, which means producing a global human paradise that makes everyday life become a kind of art. In a sense, the space of human beings existence proposed by Henri Lefebvre has great similarities with the communist society proposed by Karl Marx. The ultimate goal of the communist society is to eliminate the capitalist private ownership, eliminate the alienation phenomenon derived from capitalism, and eliminate the "three main differences", thus establishing a union of free people and realizing the free and comprehensive development of human beings. That is to say, the highest value goal of the communist society is to return people to their natural, esoteric nature, to realize their free personalities, and to live freely in this world as a kind of existence. Henri Lefebvre proposed to produce the space of human existence in the world, and use it as the social basis for transforming the daily life, whose theoretical point is to criticize and transcend the abstract space of capitalism, and to establish a social space that conforms to the nature of human beings and adapts to the existence of human beings for the free survival and development of human beings, so that people can live in the world as a kind of existence that returns to the nature of their own class. In a sense, Henri Lefebvre's above opinion has similarities with establishing a communist society. To a certain extent, the ultimate goal of space production — the production of the space in which human beings exist—is the preparation for space production in order

to establish a communist society, or the space production for communism. In other words, to some extent, the ultimate goal of space production is equivalent to establishing a space for communist society around the world, thus providing the foundation and premise of political geographical space for building communist society and realizing a communist lifestyle. In a sense, the ultimate goal of space production proposed by Henri Lefebvre is a spatial rewriting of the great ideal of communism put forward by Karl Marx, or a political geography strategy or a spatial practice path for realizing communist society.

Currently, some people still have doubts or even negative attitudes toward "communist ideal". Specifically, for example, negative ethos or thoughts such as "communism is distant", "communism is paradox" or "communism is virtual or nonexistent" are held or believed by them. To a certain extent, the ultimate goal of space production proposed by Henri Lefebvre can serve as a practical strategy or path for us to prepare for communism, which is to first carry out the space production of communism. Therefore, we should stick to the great ideal of communism and strengthen the space production of communism.

5. CONCLUSION

Although Lefebvre's theory of space production was born in the last century, its theoretical value has not yet become obsolete. In the current era of globalization, the capitalist production mode, in the context of the social history of the continuous occupation and production of space in various countries and regions, we can still draw nutrition from the theory and guide China's economic and social development. Besides, from the theory, we can also get some helpful ideas and directions for the actions to achieve our communist ideals.

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Research Progress in the Effects of Strength Training on the Patients with Mild Cognitive Impairment

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Abstract: Mild cognitive impairment (MCI) is an early stage and risk factor of Alzheimer's disease. Exercise intervention, as an economical, effective method without side effect, is widely used in early clinical treatment of patients with MCI. Starting from the way of strength exercise which has better effect on patients with MCI' exercise intervention, in this paper, the influence of strength exercise on cognitive function, possible mechanism and strength intervention program of patients are discussed, and the research of strength exercise intervention on MCI is prospected, with a view to providing a guidance and reference for the clinical treatment of patients with MCI' exercise intervention.

Key words: Strength exercise; Mild cognitive impairment; Exercise intervention

1. INTRODUCTION

Mild cognitive impairment (MCI) is a pre-stage of Alzheimer's disease (AD), a critical state of memory impairment and cognitive impairment between normal aging and dementia. Patients in this state have memory disorders that are beyond their age, but their brains still retain high-grade nerves, and their daily lives are unaffected, and the diagnostic criteria for dementia are not met. [1,2]

With the deepening of the aging of China's society and the emergence of the trend of declining birthrate, MCI and AD have brought a heavy burden to China's economy and society. According to the World Report on Alzheimer's Disease in 2015, the global cost of care for dementia in 2015 was about 818 billion US dollars. Early intervention in MCI can slow down the cognitive decline of 22% of the patients and delay the transformation from MCI to AD. Therefore, early intervention in MCI is particularly important. [3,4] As an economical, effective and non-side-effect method, exercise intervention has been widely used in the early clinical treatment of patients with MCI, and it is also widely concerned by experts and scholars in this field. In this paper, starting from the point of view of exercise intervention, the way of strength exercise which has better effect on patients with MCI will be reviewed in order to provide some guidance and reference for the clinical treatment of MCI.

2. OVERVIEW OF MCI TREATMENT

At present, the treatment of MCI at home and abroad mainly focuses on both drugs and non-drug treatment. Clinically selected drugs mainly include galantamine, donepezil, rivastigmine and memantine, but the efficacy of these drugs is still controversial. The risk of adverse reactions such as nausea, vomiting, diarrhea and headache in patients taking these drugs for a long time increases correspondingly. Moreover, patients with MCI had no significant symptoms of discomfort, and long-term drug compliance is questionable. [2,5,6] Therefore, more and more attention has been paid to the non-drug treatment of MCI. The commonly used methods include cognitive training, diet, exercise intervention and so on. [7-9] Current studies have confirmed that cognitive training is beneficial to the overall cognitive function and memory, but needs doctors or computer software to implement, which is not easy to promote. Foreign studies have shown that the Mediterranean diet can reduce the risk of cognitive impairment and delay the transformation of MCI to AD. However, people's dietary habits are affected by many factors and are difficult to change. Domestic studies have found that traditional acupuncture and moxibustion therapy can improve cognitive function of patients with MCI, but the long-term compliance of acupuncture and moxibustion treatment is a challenge. Foreign studies have found that lack of exercise is one of the risk factors of MCI. Participation in exercise can reduce the incidence of MCI and the risk of MCI converting to AD. [10-12]

However, as far as current research is concerned, the role of exercise in patients with MCI is still controversial, and there are many kinds of exercise options, such as aerobic exercise, strength exercise, traditional Chinese kungfu, and so on. Moreover, there is no generally accepted standard concerning the specific issues of exercise intensity, frequency and time in the exercise intervention program, which deserves further in-depth study and discussion.

3. EFFECT OF STRENGTH EXERCISE ON PATIENTS WITH MCI

3.1. Strength exercise effectively relieving cognitive function in patients with MCI

Strength exercise is an active exercise of the muscles against external resistance, usually including dumbbell exercises, combined instrument exercises, and barbell exercises. Nagamatsu and other foreign scholars [13] divided 86 patients with MCI into 3 groups,

respectively, giving 26 weeks of strength exercise, aerobic exercise and balance finishing exercise. After 6 months, the group with strength training scored significantly higher than other groups in terms of cognitive and memory ability. It was further found by NMR that strength exercise may lead to positive changes in the function of the three cortical regions associated with coding and memory in the right tongue, occipital sac and the right frontal lobe. Fiatarone et al. [14] divided MCI subjects into cognitive training group, strength training group, cognitive and strength training group and control group. The Symbol Digit Modalities Test (SDMT) was used to evaluate the attention of subjects. The results showed that strength training could significantly improve the SDMT score of patients, while cognitive training did not significantly improve the SDMT score. There was no significant difference in SDMT score between cognitive and strength training group and simple strength training group. The above research shows that strength exercise can effectively stimulate skeletal muscle and myocardium of patients with MCI, and have a positive impact on their own metabolism. It can objectively promote cerebral blood flow and oxygen supply to brain tissue, increase and improve the volume and function of hippocampus in cognitive function area, and ultimately improve the cognitive function of the elderly.

3.2. Strength exercise: selective for relieving MCI

Due to the influence of various factors, such as experimental methods, equipment and research population, the results of strength training on MCI have also been diversified. Some scholars believe that strength training can improve the symptoms of MCI, but other scholars believe that improving MCI by strength training is selective, not absolute. The study by foreign scholar Ward [15] and others found that the effect of strength exercise on the cognitive function of the elderly is different, and the effect on executive ability of cognitive function is the best, while the effect on self-control, processing ability and perception speed is not obvious. A study by LeBlanc et al.[16] with a large number of participants and a long period of time also confirmed this view, in which 5925 elderly women over 55 years of age were selected as the subjects whose cognitive status was predicted 6-8 years later through the study of exercise patterns and frequencies. The results showed that strength exercise had the most significant effect on executive ability of the elderly with MCI. The above research shows that strength exercise can effectively improve the decline of cognitive function caused by aging, and the effect of improving the executive ability is particularly obvious.

3.3. Possible mechanism of strength exercise improving MCI

With the increasing number of patients with MCI, more and more researchers are paying more attention to the effect of strength exercise on MCI. But up to now, the exact mechanism of improving MCI by strength training is not very clear. Many scholars at home and abroad try to elaborate it from different angles. [12,13,17] ① Cellular and molecular hypothesis. Strength exercise can promote the regeneration and vitality of brain neurons, release neurotransmitters and growth factors to promote learning and memory, and improve the antioxidant capacity of brain and vascular cells so as to prevent and enhance cognitive function. ② Cardiovascular function hypothesis. Strength exercise can effectively improve patients' cardiovascular function, so as to improve patients' cognitive function. ③Mediation variable hypothesis. Strength exercise, in addition to directly affecting cognitive function, can also affect other factors, such as blood circulation, metabolism, etc. can also indirectly affect the cognitive function of patients.

④ The plasticity hypothesis of the brain. The hypothesis is that the brain is malleable, and exercise, especially strength exercise, can improve the regulation of the central nervous system in the brain, thereby shaping the brain and improving its cognitive function. ⑤Social cognitive theory. The theory holds that strength training can effectively improve the cognitive ability of patients by improving some social factors, such as positive changes in patients' subjective self-esteem, mood, mental state, etc. ⑥The cognitive reserve hypothesis. The hypothesis believes that people with higher cognitive reserve have more close and effective brain network connections. If one functional area of the brain is reduced, other brain areas can be effectively compensated. Effective strength training can effectively improve all aspects of cognitive process, promote the effective improvement of brain network structure, promote the human body to have a higher level of cognitive reserve, and alleviate MCI.

It should be pointed out that at present, cognitive function mainly involves intelligence memory, situational memory, semantic memory, executive function and so on. The specific aspect in which the strength training plays a role needs to be designed and implemented according to different research perspectives, and different research methods may draw different conclusions.

3.4. Strength intervention program for patients with MCI

In recent years, most of the studies on patients with MCI have adopted intervention programs with comprehensive training, but since the specific content of the intervention programs are different, the intervention effect is also different, and the clinical guidance significance is limited. The strength intervention program for patients with MCI includes exercise style, intensity, frequency, time and so on.

3.4.1. Exercise style

Most of the strength exercises for patients with MCI are resistance exercises, assisted by aerobic exercises or physical and mental exercises. [14,18,19] The common methods of resistance exercise for patients

with MCI include dumbbell exercise and combined exercise of instruments, which is not only effective but does not require a lot of space and equipment. Resistance exercise can improve the cerebral blood circulation and material metabolism indirectly through effective stimulation of muscles, and ultimately improve the cognitive function of patients with MCI. Patients with MCI often choose aerobic exercises such as jogging and walking to promote metabolism, which not only improve their metabolic level, but also promote the survival of brain neonatal neurons, reduce the degree of brain oxidation and stress, increase vascular regeneration, and effectively alleviate the clinical manifestations. Physical and mental exercise refers to physical activities that exercise both body and mind. It can control the function of the body by focusing on it and achieve the purpose of physical exercise. For example, traditional Chinese Tai Chi, Wushu, Indian yoga, etc., have a good exercise effect on MCI patients' thinking, memory and execution ability, and have a significant effect on relieving and preventing MCI.

3.4.2. Exercise intensity

For patients with MCI, the intensity of strength exercise mainly refers to the stimulating intensity of brain and human physiological function through physical exercise. Generally, it needs to be formulated according to the cardiopulmonary function and exercise ability of patients. Of course, due to the particularity of individual patients, it needs to be formulated according to individual differences. Angevaren and other foreign scholars [20] have found that there is a significant correlation between exercise intensity and some aspects of cognitive function. Compared with low intensity exercise, moderate intensity exercise has a more positive effect on improving cognitive function. The exercise intervention program by a domestic scholar Wu Han [18] for the patients with MCI uses aerobic exercise-based comprehensive training, and the exercise intensity is 60-80% of the maximum heart rate in patients' ECG exercise test.

3.4.3. Exercise frequency

In the strength intervention program for patients with MCI, the frequency of exercise needs to be adjusted and designed according to the type, time and individual's degree of fatigue. Generally speaking, for aerobic exercise, experts recommend three to five exercises per week. [18] For the influence of strength exercise on patients with MCI, some studies [21,22] have found that the intervention effect of high frequency group is more obvious than that of low frequency group. The cognitive function of high frequency group is more flexible, and the scale score of cognitive function is improved. Therefore, when experts recommend strength exercise programs for patients with MCI, most of them take exercise frequency of three times a week.

3.4.4. Exercise time

A study on MCI found [23] that patients with MCI who often exercise have a significant increase in the connections between the frontal cortex and occipital cells of the cerebral cortex one year later, but there is no significant change in the previous 6 months, which shows that the brain is malleable and needs a longer duration if positive changes are needed. Another study confirms this conclusion, too [24]. Compared with short-term strength exercises, strength exercises lasting more than 6 months have a better effect, and the exercise time for each strength exercise should be 30-45 minutes. Too much or too little time will lead to deviations in the final effect.

4. RESEARCH PROSPECT OF STRENGTH EXERCISE INTERVENTION ON MCI

It can be concluded from the above that many studies show that strength exercise can improve mild cognitive impairment from various perspectives, ways and levels, which is important to prevent and alleviate mild cognitive impairment. However, there is still much room to explore how to design rehabilitation programs for strength training to improve mild cognitive impairment. Strength exercise intervention in MCI may be studied in the future from the following aspects:

4.1. Joint study of multiple factors

Many current studies have found that not all MCI patients who are engaged in physical exercise have had their symptoms improved, which means that there are still some other factors that more or less affect the cognitive function of patients. From the perspective of alleviating mild cognitive impairment, effective and reasonable combination of multiple factors should be studied. For example, healthy diet has an effect on the metabolism and regulation of substances, which objectively affects the cognitive function of patients. Combination of good social interaction and exercise can effectively improve the cognitive function of patients, while for MCI patients with social concerns, exercise has little stimulating effect on their brain nerves.

4.2. Discussion on strengthening the mechanism of action

As mentioned above, several hypotheses have emerged to explain the possible mechanism of improving MCI by strength exercise. However, the existing interpretation lacks the summary and systematic analysis of the internal mechanism, and the scientificity and rationality need to be improved. Moreover, most of the hypotheses are from their own point of view, without putting forward a universal mechanism or hypothesis. Future research in the field of MCI should be further explored from the genetic and molecular level to complement and improve the relevant theories and mechanisms.

4.3. Further standardization of basic and clinical research

At present, there are still some defects in the basic research of MCI. Because of the different subjects, the experimental samples used are relatively limited,

randomized control design is unreasonable, different ways of exercise are adopted, and the results of the study are also inconsistent. The basic research plays a limited role in guiding clinical practice. At the same time, in China, most patients with MCI are in the community and at their own homes, which is very difficult to find suitable research objects in clinical practice and also causes the relative lag of clinical research results in this field.

To sum up, the clinical symptoms of patients with MCI can be alleviated by regular strength exercises to improve the functions of multiple organs and systems. To some extent, it can prevent the occurrence or aggravation of mild cognitive impairment, improve the quality of life of patients with MCI, and alleviate the financial burden and mental stress of social families.

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Evaluation of SME Financing Credit Risk based on Logistic Regression

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Abstract: In view of the fact that there is no specific credit evaluation method for Small and medium-sized enterprises(SME) in China, this paper explores the use of logistic regression function to analyze the establishment of SME credit risk and credit risk index system. The loan data of the third-party credit platform was appropriately selected. The index system was established by using the qualitative indicators that were rarely involved in the previous research, and then the logistic regression model was established to empirically measure the credit risk of SME in China. The empirical analysis shows that the model has high validity and accuracy and can be used as the scientific basis for risk assessment of SME.
Key Words: Credit Risk; Metric model; Logistic regression function

1. INTRODUCTION

SME have difficulties in financing compared to large enterprises. Many reasons have caused the financing difficulties of small and medium-sized enterprises, and SME themselves are one of the most important reasons. The creditworthiness of SME plays an important role in the financing process, while the lack of credit capacity of SME in China is congenital and the credit rating is generally not high. Moreover, the company's own system has many defects and lacks standardized management, which leads to worse and worse business management and a sluggish financial situation. Therefore, in order to sustain development and improve financing capacity and financing status, enterprises must improve their own defects, establish a corporate system, and establish a more standardized enterprise system. Therefore, it is necessary to establish a credit risk assessment model for SME in China.

Lv Xiaofang used the factor analysis method in the multivariate statistical method to evaluate the credit risk of sample enterprises, and obtain the loan credit risk evaluation model suitable for SME in China.[1] Chen Shoudong estimated the risk contribution of 33 listed financial institutions in China to the financial system as a whole through extreme quantile regression techniques.[2] Zhang Jingui appropriately selected the listed companies in 2013 as a sample, and used the factor analysis method to screen the credit risk indicators of SME, and formed a credit risk assessment model for SME based on Logit regression model.[3] Xie Shangyu proposed a linear ARCH-Expectile model, which shows that the source of risk factors and their size and direction are different.[4] Xun Qian used the KMV model to select ST and non-ST companies in China's listed companies for comparison, and concluded that the KMV model has certain usefulness in quantitative management of its credit risk.[5] Wen Xiaoni used 66 SME board technology listed companies as research samples, based on empirical analysis of MLP neural networks.[6] Liu Xiangdong established a risk metric model based on M-Copula-Sv-t. The optimal portfolio weight calculated by the model provides an important reference for foreign exchange portfolio investment.[7] Wei Yun constructed a credit risk assessment model for SME using a combination of cluster analysis and factor analysis.[8] Sun Hao established a cross-DEA-Tobit model and used 13 small and medium-sized enterprises for empirical analysis.[9] Han Long used the stock closing and data to define the CoVaR technology.[10] Through the solution of CoVaR, the maximum possible contribution to the joint systemic risk generated by China's financial system was obtained. In the process of establishing a Logistic regression model, qualitative indicators were added to measure the credit risk of SME.

2. THE DETERMINATION OF THE SME CREDIT RISK MODEL INDEX SYSTEM

(1) Select the source of the sample and data

The research data in this paper comes from certain loan statistics of third-party credit platforms. Combined with the actual situation of today's SME, the analysis data of their loans is extracted, with a ratio of 1:2, finally, 1544 data samples were taken, including 1010 normal samples and 534 default samples. Within the scope of expected rationalization, 911 training samples were taken and 633 test samples were tested. There are 605 normal samples in the training samples and 306 default samples, the test sample has 405 normal samples and 228 default samples.

(2) Screening original indicators

Traditionally, the assessment of institutional loan risk comes from financial data risks. However, such assessment criteria are somewhat temporary, blind, limited, and transparent, and all have an impact on the outcome. Especially for some SME, it is difficult to guarantee the authenticity and reliability of their data

sources. Therefore, many investigators have taken into account the non-financial factors and actual conditions, and the Basel Bank Inspectorate has stated that banks should not only focus on a quantitative factor, but also on qualitative indicator factor. Summary, this article refers to the quantitative and qualitative dual indicators for presentation, Table 1 for a detailed description.

Table1. List of original indicators

Indicator type		Abbreviation	Indicator name	Calculation formula or description
Quantitative (financial) indicator	profit ability	X_1	Total assets return rate	Ebit
		X_2	Return on Assets	Net income
	Operational capability	X_3	Accounts receivable turnover	Operating income
		X_4	Total asset turnover	Operating income
		X_5	Turnover of fixed assets	Operating income
	Solvency	X_6	Assets and liabilities	Total liability
		X_7	Property ratio	Total liabilities
		X_9	Cash asset ratio	Total assets
	Development ability	X_{10}	Capital growth rate	Total assets
		X_{11}	Sales growth rate	Sales growth in the current period
		X_{12}	Asset growth rate	Initial owner's equity
		X_{13}	Business continuity	Business life
Qualitative indicator	Business status	X_{14}	Employee situation	number of workers
		X_{15}	Credit situation	Approximate representation of the length of cooperation with the bank
		X_{16}	Business owner's life	Business owner's life
	Business owner status	X_{17}	Business owner management level	Approximate representation of the level of business owner education
		X_{18}	Corporate status	Approximate representation of the market share of the main products of the company
	Environmental indicator	X_{19}	Technological innovation	Approximate representation of sales revenue
		X_{20}	business background	The stage of development of the industry in which the enterprise is located, policy support.

(3)Indicator screening

The data processing technology in the project research is realized by R software programming. In a pair of highly correlated indicators with a partial correlation coefficient greater than 0.7 and reflecting information duplication, an index indicating that the F is small and the ability to discriminate against the default state of the small enterprise is deleted. It not only avoids the tedious information of the evaluation index system after the first screening, but also it avoids the mistakenly deleting the indicators that have a great influence on the default state, the indicators for the selection of indicators of the existing research evaluation system and the indicators for distinguishing the status of the default status of the indicators have been changed. Finally, we get 8 indicators into the model, the specific data is shown in Table 2.

Table 2. Indicator screening analysis results

Selected indicator	Tolerance value	Relevance	F value	Significant level
Cash asset ratio X2	0.873	0.107	156.608	0.000
Industry Background X13	0.881	0.019	128.045	0.000
Return on capital X6	0.882	0.013	84.757	0.000
Current ratio X1	0.889	0.012	69.955	0.000
Accounts Receivable Turnover Rate X8	0.883	0.014	59.128	0.000
Sales growth rate X10	1.400	0.018	43.652	0.000
Credit status X17	1.400	0.000	37.786	0000
Business continuity X16	1.400	0.000	34.674	0.000

3. CREDIT RISK ASSESSMENT Model

Logistic regression function is used for multiple dependent variables of one independent variable. It is like the SME default situation studied in this paper. It considers many aspects and adds qualitative indicators. The Logistic regression function predicts how likely it is that something will happen in different situations. It can also determine how likely a company is to default. The probability P of logistic regression function must be 0 < p < 1, so it is difficult to describe the relationship between independent variables and P by linear relation. In addition, when p approaches two extreme values, it is not easy for ordinary methods to observe the subtle changes of P. Logistic regression assumes that the probability of occurrence of events obeys the conditional probability of cumulative logistic distribution, which takes precedence over the general linear regression model because it does not require normal distribution. β_i used to indicate the financial status of the company, If $\beta_i = 1$, it means that the company has an event of default;If β_i=0, it means that the company does not have an event of default. Use P to indicate the probability of corporate default.

$$P_i = \mathrm{F}(\beta_i) = \frac{e^{\beta_i}}{1+e^{\beta_i}} \quad (1)$$

among them:

$$\beta_i = \alpha_0 + \sum_{j=1}^{k} \alpha_j X_{ij} + e_i \quad (2)$$

Select the training sample, substitute the index system determined above to establish a logistic model for regression, and obtain the following empirical results.

Table 3. Logical regression model empirical results

Indicator name	B	S.E.	Sig
Flow ratio X1	-0.287	0.085	0.000
Cash asset ratio X2	-8.058	1.157	0.000
Return on capital X6	-1.148	0.143	0.000
Sales growth rate X10	-0.885	0.178	0.086
Industry Background X13	-1.456	0.275	0.000
Business life limit X16	0.007	0.002	0.181
Credit status X17	0.095	0.035	0.000
Constant term	-0.111	0.156	0.000

From Table 3, the logistic regression equation can be solved using the MATHTABE software. Assume that 0.5 is used as the threshold for classification of various cases. The criterion for default is that the predicted value is greater than the critical value, and the normal is that the predicted value is smaller than the critical value. The empirical test shows that the selected risk metrics are suitable for the characteristics of China's current SME and the economic environment they face.

4. TEST OF RISK ASSESSMENT MODEL

Whether the model is effective or not needs to be tested, and the predictive ability of the model is generally divided into an in-sample test and an out-sample test.

In-sample inspection. The in-sample test is to use the data of the established model, compare the actual value and the predicted value, and use the R piece to give the test result in the sample.

The results of the in-sample test, for 605 normal samples, correctly judged 417, the accuracy rate was 68.9%; for 306 default samples, 225 correctly, the accuracy rate was 73.4%. The total accuracy of the model is 71.2%.

We can use the samples previously reserved for out of sample inspection. Let the threshold value be 0.700, which is greater than the critical value for financial distressed enterprises and less than the critical value for financial health enterprises.

A total of 633 and 405 normal samples were tested, and 306 were correctly judged, the accuracy rate was 75.6%; 228 default samples were correctly judged by 184, the accuracy rate was 80.7%; the overall judgment accuracy was 78.2%.

5. CONCLUSION

Aiming at the current situation of China's small and medium-sized enterprises financing, and rarely adding quantitative indicators to study the current situation of credit risk management, this paper studies the establishment of SME credit risk indicators based on logistic regression function. In the process of empirical analysis, a new research index, qualitative index, was established to construct a logistic regression model to assess the credit risk of SME, and the accuracy and feasibility of the model were considered. It is found that the overall accuracy of

logistic in this study is high, and the second type of error rate is low. This indicates that the mathematical model constructed in this paper can better evaluate the credit risk of SME in predicting the credit risk measurement of SME. The conclusions obtained in this study have certain reference value for the ability of discriminating the status of default and dealing with the probability of default risk of SME credit.

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Research on the Efficiency of Technological Innovation in China's High-Tech Industry

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Abstract: This paper selects the main provincial data of each economic circle, including the Yangtze River Delta region represented by Shanghai, Jiangsu and Zhejiang provinces. The Bohai Rim region represented by Tianjin, Beijing, and Hebei province; the Pearl River Delta region represented by Guangdong province, through the establishment of input and output of technology innovation efficiency index application system, using data envelopment analysis (DEA) method to measure high technology industry technology innovation efficiency, and according to the calculated result, to propose how to promote China's high technology industry technology innovation efficiency.

Keyword: Data Envelopment Analysis (DEA) method; Factor analysis; Technological innovation efficiency

1. INTRODUCTION

Field of high technology industry refers to the application of advanced skills in research and development achievements, and provide important form of collection production for products and services, the main advantages of it are as follow: low energy consumption with less raw material consumption, high additional value, and moreover also has the high inventory, high risk, and high return permeability [1], According to the regulation of national statistic bureau for R&D Input intensity, the relatively high manufacturing industries including medical drug research, aerospace craft and related parts equipment manufacturing, electronic information and signal network structures, manufacturing, computer and related software and hardware equipment, medical equipment and instrumentation manufacturing, information chemicals manufacture and so on. From the point of regional distribution, there are having sprung up concentrated high technology industry area in our country so far, mainly concentrated in the Pearl river delta, Yangtze river delta, Bohai sea area, these areas that owned concentrated high technology industries are distinctive.

2. ARTICAL REVIEW

DEA model is also widely used in relevant domestic articals. For example, Cheng Liwei analyzed the relationship between capital allocation capacity and scale efficiency to research the efficiency of technological innovation in high-tech industries through a three-stage method based on window DEA [2]. Wang Hui used the method that the three stage DEA in combination with SFA method to find that under the condition of considering the environment overall level of China's, China high technology industry innovation efficiency is low [3]. Some scholars use efficiency analysis and evaluation method study of innovation resources allocation. For example, Xiao Zelei and Wei Ping used DEA method combined with other research methods to study China's regional high-tech industry innovation resource utilization [4-5], Du Xianjin built a comprehensive model based on DEA and differential drive model to calculate and investigate nine representative regional technological innovation efficiency [6]. Data envelopment analysis (DEA) is a non-parametric method, belongs to the category of the linear programming, it is a pareto optimal solution by method of two or more indexes measured, and the decision making unit to construct the input-output efficiency evaluation value by linear programming method to form an efficient frontier border, relative efficiency for its border with the frontier. This research can be regarded as originating from the traditional efficiency theory of Farrell, which currently includes CCR, BCC and SBM. Because the traditional DEA model system can only output efficiency values between 0 and 1, Tone later proposed the ultra-efficient SBM model [7] based on the purpose of correcting relaxation variables, so that the effective efficiency value of DEA can be greater than or equal to 1, forming a certain comparability, and can achieve further evaluation of the ranking [8]. Considering that China attaches great importance to high-tech industry, the input mode and scale continue to expand, in this environment, the output orientation in the DEA model is more in line with the research direction of this topic, so it is set up as the SUPER-SBM model of super-efficiency, guidance for output, variable scale compensation.

3. MEASUREMENT OF TECHNOLOGICAL INNOVATION EFFICIENCY

(1) Sources of data

The data involved in this paper are taken from the relevant panel data in the statistical yearbook of China's high-tech industry, and the data of the provinces and cities of China's three major economic circles from 2000 to 2016 are selected according to the needs. According to the regional division of the country, the availability of data, as well as the use of Chen Hongjun and Other in the study of the data of the three major economic circles, select the main

provincial data of each economic circle, the Yangtze River delta using Shanghai, Jiangsu province, Zhejiang province as the representative region, the Bohai Rim using Beijing, Tianjin, Hebei province as the representative; The Pearl River Delta adopts Guangdong province as the representative area [9].

(2) Construction of indicator system

Based on the existing research results and the availability of yearbook data, the application system of technological innovation efficiency input and output index is established, taking into account the scope of the concept of technological innovation involved in this paper, as shown in table 1 below.

Table 1 Input and output indicators of technological innovation efficiency

Level I Indicators	Level II Indicators	Level III Indicators	Units
Input	Manpower input	R&D personnel equivalent	Ten thousand people/year
	Financial input	Internal expenditure of R&D funds	Billion yuan
		Expenditure on Technological Renovation	Billion yuan
		Expenditure on Technology Import	Billion yuan
		Digest and absorb expenditure	Billion yuan
		Expenditure on Purchasing Domestic Technical Funds	Billion yuan
		Expenditure on New Product Development	Billion yuan
Output	New Product Output	New Product Sales Revenue	Billion yuan
	Output of scientific and technological achievements	Number of patent applications	Ten thousand pieces
		Number of patents for invention	Ten thousand pieces

Among them, R&D staff equivalent to full-time equivalence is an internationally recognized comparable indicator for the input of human factors in the field of science and technology. The statistical indexes of R&D personnel in our country are mainly the total number of full-time personnel and the full-time workload. The city's workload is to convert the workload of part-time working people into R&D work to the number of full-time work, meaning a person's annual workload, Unit for the year.

(3) Indicator reduction dimension

Selecting the indicators required by the DEA method mainly according to the actual situation such as accessibility, integrity, practical significance and so on to streamline, and ultimately should make the number of indicators m and DMU number n maintain the relationship $2m \le n \le 3m$ [10]. Because the DMU of this study is 7, and the relationship with the optimal quantity is biased, the principal component analysis method is used to reduce the dimension of 10 indexes. First, the input index is analyzed, and it is measured that the input index KMO coefficient is 0.68 > 0.5, bartlett spherical degree test said the p value is 0.00 < 0.05, so the data correlation is sufficient, and it is suitable to reduce the dimension extraction information, among which the cumulative variance contribution rate of the first and second principal components reaches 76.35%.

The output index is analyzed, and it is measured that the KMO coefficient is 0.77 > 0.5, bartlett spherical degree test said the p value is 0.00 < 0.05, so the data correlation is sufficient, and it is suitable to reduce the dimension extraction information, in which the variance contribution rate of the first principal component is considered to be as high as 94.45%. Then, by processing the component matrix of the software output, divided by the square root of its characteristic root, the principal component coefficient is obtained, and the result is shown in table 2.

Table 2 Main ingredients coefficient table

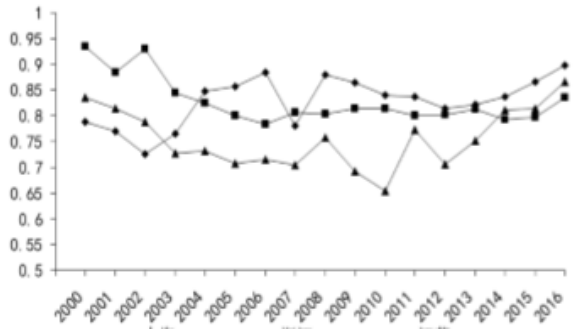
Indicators	Principal Components		
	Input 1	Input 2	Output 1
R&D personnel equivalent	0.45	-0.05	
Internal expenditure of R&D funds	0.89	-0.17	
Expenditure on Technological Renovation	0.69	0.44	
Expenditure on Technology Import	0.90	0.29	
Digest and absorb expenditure	0.50	1.70	

Expenditure on Purchasing Domestic Technical Funds	4.28	-1.32	
Expenditure on New Product Development	5.60	-0.95	
New Product Sales Revenue			0.58
Number of patent applications			2.90
Number of patents for invention			4.17

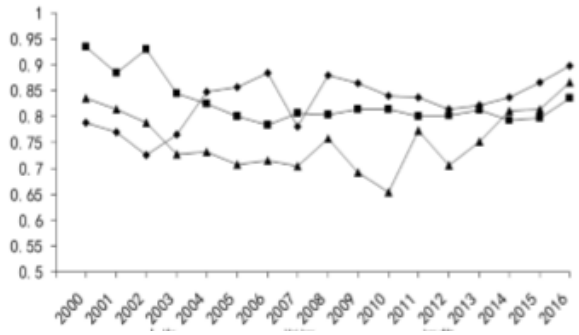
On this basis, the main ingredient score is obtained by further using the main ingredients coefficient and the sum of the product of the standardized original data. Because the DEA model cannot handle the negative input, negative output [11-12], so the results need to be positive processing. Based on the results of the transformation invariance of the DEA model, such as Zhu J, Shaodu and Ma Jianguan: Each decision unit adds or subtracts the same positive number at the same indicator data and make it satisfy $(x_j', y_j') > 0$, the DEA validity remains unchanged [11-13], according to the actual situation, This article selects add value 2 to make the data available [14-15].

(4) Results of the evaluation of technological innovation efficiency

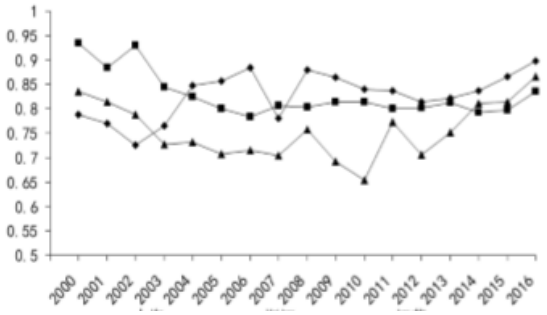
Using DEA Solver Pro5.0 software to select SUPER-SBM model to calculate the technological innovation efficiency of the major provinces and cities in China's three major economic circles, the output results of 7 provinces and cities are shown in Figure 1.



Yangtze River Delta Region



Pearl River Delta Region



Bohai Rim Region

Figure 1 Technical innovation efficiency value of high-tech industry in China's three major economic circles

According to all the output results, the fluctuation of technological innovation efficiency value of high-tech industry in Yangtze River Delta and Bohai Rim area is more stable and concentrated, and the latter is slightly higher than the former, and the Pearl River Delta region is more volatile, which has been rising gradually since around 2009 and has successively surpassed the Triangle area and the Bohai Rim region. It eventually reached an efficiency peak of 1.78 in 2016 and then fell back. In the Yangtze River Delta region, the initial performance of technological innovation efficiency in Zhejiang Province is better, which most years efficiency value are more than 0.80, besides 2000 and 2002 technology innovation efficiency level are more than 0.90, and from 2000 to 2014 has been above Jiangsu province. Shanghai successively overtook the other two provinces in 2003 and 2004, and then remained largely above the two provinces. The Yangtze River Delta region has never reached the DEA effective. In the Pearl River Delta region, the efficiency value before 2014 did not up to the DEA effective until 2015. In the Bohai Rim region, Hebei is more stable than the other two cities, but has gradually declined since 2006, deviating from DEA effectiveness. The efficiency values of Beijing and Tianjin are more volatile. Beijing reached a minimum value of 0.75 at 2004 and reached a maximum of 1.04 in 2008. Tianjin reached its lowest value of 0.73 in 2007 and reached a maximum of 1 in 2005. In addition to the regions where the output is insufficient, the relaxation variables are shown in table 3, and the percentages in parentheses are the proportion of the value of the relaxation variable in the actual input or output value. From 2000 to 2010, there were underemployment problems in all three regions; 2011 years later, in addition to the lack of output in most areas, there was a problem of excess investment and insufficient output in a small number of areas, mainly in Jiangsu and Guangdong. As can be seen from table 3, redundancy

is attributed to the second main component, namely, digestion and absorption funds and technical transformation funds investment redundancy, inferred that Jiangsu, Guangdong two provinces after 2010 years of technology integration capacity, including digestion and understanding, collation and absorption, integration and even innovation process of the ability to master the lack of mastery.

Table 3 Other input-output structure problems and conclusions

Annual Provincial	Municipal and Regional	Input 1 Redundancy S-(1)	Input 2 Redundancy S-(2)	Inadequate Output 1 S+(1)	Conclusion
2008	Beijing	-	-	-0.059 （-3.39%）	effective
2011	Jiangsu		0.60 （10.53%）	0.77 （29.47%）	Overinvestment Insufficient output
2012	Jiangsu		0.062 （1.48%）	1.19 （41.79%）	Overinvestment Insufficient output
2013	Guangdong		0.42 （17.18%）	0.28 （5.47%）	Overinvestment Insufficient output
	Jiangsu		0.39 （8.46%）	1.00 （33.16%	Overinvestment Insufficient output
2014	J iangsu		0.18 （4.45%）	0.78 （23.27%）	Overinvestment Insufficient output
	Guangdong			-0.65 （-11.08%）	effective
2015	Guangdong			-2.79 （-43.81%）	effective
2016	Jiangsu		0.11 （2.92%）	0.60 （15.50%）	Overinvestment Insufficient output
	Guangdong			-1.40 （-18.06%）	
	Beijing			-0.32 （-15.21%）	effective

In addition, although most years in the region did not reach the DEA effective, but some of Guangdong province output and Beijing output exceeded the valid value. Among them, Beijing where host the 2008 Olympic Games reach the DEA effective and the DEA is also effective at the beginning of the implementation of 2016 “Thirteen-Five”, in 2014-2016, Guangdong introduced and implemented the relevant Industrial Technology field integration program, Science and technology and capital linkage to support small and medium-sized enterprises in the high-tech field of production planning, such as the integration of science and technology and financial development of important decisions, local related scientific and technological management, economic and financial sectors have helped to speed up the high-tech zone and capital docking frequency and depth, so as to drive the investment for high-technology industries, and Thus, it is beneficial to reverse the unbalanced pattern of excess investment and insufficient output, and has made a good result in improving the efficiency of technological innovation.

4. CONCLUSIONS AND RECOMANDATIONS

(1)Research conclusions

Based on the above calculation results, the efficiency value of the Yangtze River Delta region is always hovering around 0.8, and it is in a relatively inferior position in the development level of each economic circle. In the Pearl River Delta region, technological innovation efficiency values were generally low, its value mainly hovering over 0.8 before 2008, and 2008 years later, the efficiency value increased rapidly. Generally speaking, the three major economic circles in the 2000-2016, especially in the Yangtze River Delta region, the low efficiency of investment and output conversion in the development of high-tech industries is a common phenomenon.

In addition to the problem of insufficient output in most regions, there are also problems of excess investment and insufficient output in the small parts of Jiangsu province and Guangdong province. Excess investment mainly refers to two sides, the one is the new technology digestion and absorption, the other is the scientific and technological transformation, that is, the integration of technology, including digestion and understanding, collation and absorption, integration

and even innovation and other processes of the ability to master the lack of mastery. Among them, especially Jiangsu Province, there were serious imbalance of input-output structure in 2011-2014 and 2016, which also had a certain impact on the overall efficiency of the economic circle.

(2) Research recommendations

The three economic circles are in the leading position in the development of China's high-tech industry, but there is still an imbalance of input-output ratio, which has an impact According to the actual situation, we should promote the higher output of high-tech industries, carefully check the factors of production input with low conversion rate of high-tech industries, and strengthen the ability of the introduction, transformation and utilization of capital, manpower and technology resources in various regions to make the best use of them.

High-tech industries are gradually getting a high degree of attention from all aspects of the country, with China's "five-year Plan", all regions should keep up with the pace of national development, respond positively, at the same time, they should carry out comprehensive implementation and advocacy at the local area on the basis of regional characteristics and regional industrial clusters.

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Humanistic Quality Education Reform of Higher Vocational Colleges during Talents Cultivation for "The Belt and Road" Construction—Taking the Specialty of Customs Declaration & International Freight as an Example

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Abstract: At present, "The Belt and Road" strategy has entered a new stage of full implementation. "The Belt and Road" education initiative promoted by the ministry of education puts forward that "education oriented and humanities first". It has become an important and urgent task for higher vocational colleges to strengthen the reform of humanistic quality education and improve the talents cultivation quality. This paper first expounds the practical significance of the humanistic quality education reform by higher vocational colleges during talents cultivation for "The Belt and Road" construction. Then closely connected with the requirements of "The Belt and Road" construction, taking the specialty of Customs Declaration & International Freight as an example and taking humanistic quality education reform as the core, it proposes the basic reform train of thought, the overall reform framework, the reform implementation of the path, four major reform steps and two key & difficult reform points.
Keywords: Higher vocational college; Talents cultivation; Humanistic quality; Education reform; The belt and road

1. INTRODUCTION

In order to promote co-construction of "The Belt and Road" educational action, the ministry of education puts forward that "education oriented and humanities first", and "improve the quality of regional population to provide talent support for co-construction of 'The Belt and Road'. [1] The basic premise of "humanities first" is to familiarity with various aspects of the humanities in all the countries along "The Belt and Road" during talents cultivation for "The Belt and Road" construction, which requires higher vocational colleges to strengthen humanistic quality education and its reform, aiming at the improvement of students' professional abilities, and closely combine with the requirements of "The Belt and Road" construction to master the humanistic knowledge and humanistic methods of the countries along the line, thus being equipped with humanistic spirit and thought of effectively participating in "The Belt and Road" construction. The enhancement of humanistic quality education and reform in higher vocational colleges is a full reflection of the implementation of "humanities first" policy in "The Belt and Road" educational action.

2. LITERATURE OVERVIEW

At present, "The Belt and Road" strategy has entered a new stage of full implementation, thus how to reform the humanistic quality education and improve the quality of talents cultivation of higher vocational colleges has become an increasingly important and urgent task for higher vocational education to enhance talent support for "The Belt and Road" construction. Humanistic quality education is an important part of China's higher vocational education. The Circular of "the Ministry of Education on Deepening the Reform of Vocational Education Teaching and Improving the Quality of Personnel Training in an All-round Way" puts forward that "strengthen the mutual integration and cooperation between public basic courses and professional courses, and strengthen the education of humanistic quality and the cultivation of technical skills, so as to improve the quality of talents cultivation in an all-round way". [2] In recent years, the researches on talent cultivation and humanistic quality education for "The Belt and Road" construction have been increasingly emerging. Zhou Gupin and Kan Yue believe that "The Belt and Road" strategy involves not only hard power such as facility construction, but also soft power such as policy and culture, while the development of the latter is far better than the competition of the former, thus putting forward that according to the strategic requirements, talents with excellent soft power should be cultivated on the basis of the "endogenous" and "extensive" educational paths. [3] Wang Yanxin believes that talent is the key for the promotion of "The Belt and

Road" strategy, thus putting forward that we should speed up the cultivation of internationalized talents who are proficient in foreign languages and international rules, and are good at seizing opportunities in the global competition with international perspective. [4] Wen Jun and Jiang Xianling believe that the need of "The Belt and Road" strategy for internationalized talents is more reflected in the complex characteristics, thus putting forward that systematic thinking innovation should be used to construct the framework system of internationalized talents cultivation in colleges and universities to improve the quality of "soft" talents cultivation. [5] Li Yang has proposed to adjust the logistics professional group with "The Belt and Road" industry development as orientation, strengthen the cultivation of logistics talents among "The Belt and Road" countries, and innovate the practical teaching mechanism. [6] Xia Wenbin believes that we must attach importance to the cultivation of talents who are familiar with the culture and history of "The Belt and Road" countries, especially the talents who are good at minor languages, and offer "The Belt and Road" courses in politics, law and language. [7] Zhou Hong believes that "The Belt and Road" construction should give priority to cultivating "cross-cultural talents" who are proficient in Chinese and foreign cultures, thus putting forward a deeper understanding of small and medium-sized developing countries, foreign policies and regulations, decision-making procedures and the trend of popular feelings. [8] Xin Yueyou and Ni Hao think that "The Belt and Road" construction is inseparable from the international talents of humanistic communication, thus proposing to speed up the cultivation of "cross disciplinary" talents. [9] Zhang Dejun has proposed that we should give full play to the important role of higher education in theoretical construction, government advice and cultural exchanges, thus creating the cultivation mechanism for high-quality creative talents to adapt to "The Belt and Road" process. [10] Deng Deai and Li Shulin have proposed to set up a professional early warning and construction mechanism around "The Belt and Road" industrial transformation and upgrading, dynamically adjust the structure of professional groups, and optimize the curriculum system according to the new requirements of post technology. [11] Zhang Xiaoqing has put forward that in the context that "The Belt and Road" strategy insists on "humanities first", we should pay more attention to humanistic quality education, and analyze and explore effective strategies of infiltrating humanistic quality education into English teaching in higher vocational colleges, so as to continuously improve students' humanistic quality [12].

In conclusion, most studies have studied talents cultivation in colleges and universities for "The Belt and Road" construction from a macroscopic perspective, and put forward relevant educational strategies and measures. However, few literatures have put forward teaching reform ideas, implementation paths or implementation scheme with strong operability from the micro level for improving the quality of talents cultivation for "The Belt and Road" construction in view of the humanistic quality education; although there are individual literatures involving "The Belt and Road" humanistic quality education, it is only limited to the teaching reform of a certain course which makes the research field too narrow; in the background of "The Belt and Road", we have not yet seen the study on humanistic quality education of customs declaration and international freight transport specialty or similar specialty in higher vocational colleges. Based on the close combination of theoretical research and practical exploration, this paper takes customs declaration and international freight as an example to explore reform ideas and implementation paths of humanistic quality education of higher vocational colleges during talents cultivation for "The Belt and Road" construction, construct a professional curriculum system that integrates "The Belt and Road" humanistic quality education, and create a three-in-one teaching mode of "teacher, curriculum and teaching", so as to provide reference for higher vocational colleges to improve the quality of talents cultivation for "The Belt and Road" construction, and promote the relevant professional construction and education reform.

3. PRACTICAL SIGNIFICANCE OF HUMANISTIC QUALITY EDUCATION REFORM OF HIGHER VOCATIONAL COLLEGES DURING TALENTS CULTIVATION FOR "THE BELT AND ROAD" CONSTRUCTION

3.1. Meet the higher requirements of "The Belt and Road" construction for the quality of talents cultivation of higher vocational colleges

"The Belt and Road" construction has put forward the following higher requirements for the quality of talents cultivation of higher vocational colleges: The emphases of "The Belt and Road" construction are policy coordination, facilities connectivity, unimpeded trade, financial integration and people-to-people bonds (i.e., "five types of connectivity"), which requires that the higher vocational colleges should not only focus on the cultivation of students' professional skills, but also improve the necessary humanistic quality for "five types of connectivity" construction, including history and geography, politics and law, customs, culture and language, etc. of the countries and regions along "The Belt and Road". Therefore, during the talents cultivation of higher vocational colleges for "The Belt and Road" construction, we must pay equal attention to professional education and humanistic quality education, and "grasp both hands".

3.2. Carry out "The Belt and Road" educational action to enhance the talent support of higher vocational education for "The Belt and Road" construction

The implementation of humanistic quality education reform of higher vocational colleges is the full embodiment of implementing the current "The Belt and Road" educational action and its "humanities first" policy; meet the urgent need of "The Belt and Road" construction for high-quality talents with technical skills, and explore the reform ideas and implementation paths of humanistic quality education of higher vocational colleges, in order to further improve the quality of talents cultivation and enhance the talent support of higher vocational education for "The Belt and Road" construction.

3.3. Promote specialty construction and sustainable development in higher vocational colleges

"The Belt and Road" construction will continue to promote transformation and technology upgrading of relevant industries, thus the core business areas and operating post groups will have profound changes; this paper takes the specialty of customs declaration and international freight in higher vocational colleges as an example to deeply analyze the higher requirements of industry transformation and upgrading for students' professional abilities, especially the humanistic quality in the background of "The Belt and Road" construction, while with the reform of humanistic quality education as the starting point, we can promote specialty construction and improve the quality of talents cultivation, so as to enhance professional competitiveness and promote the sustainable development of specialties.

4. BASIC IDEA OF HUMANISTIC QUALITY EDUCATION REFORM OF HIGHER VOCATIONAL COLLEGES DURING TALENTS CULTIVATION FOR "THE BELT AND ROAD" CONSTRUCTION—TAKING THE SPECIALTY OF CUSTOMS DECLARATION AND INTERNATIONAL FREIGHT AS AN EXAMPLE

Unimpeded trade and facilities connectivity are the key points in the construction of five types of connectivity of "The Belt and Road", while the support of customs clearance and transportation system is the core support, and the talent support of customs clearance and transportation is the key support, thus taking the specialty of customs declaration and international freight as an example, this paper puts forward the reform ideas and implementation paths of humanistic quality education in this specialty, aiming at comprehensively improving the quality of talents cultivation for customs clearance and transportation, and enhancing the service ability of higher vocational education to "The Belt and Road" construction, which has stronger representativeness.

4.1. Deeply analyze the situation of humanistic quality education in specialty of customs declaration and international freight of higher vocational colleges in the background of "The Belt and Road"

Talents of customs clearance and transportation are the core support for the construction of unimpeded trade and facilities connectivity of "The Belt and Road", thus it is urgent for higher vocational colleges to cultivate the talents with both humanistic quality and professional skills, while taking Guangdong Communication Polytechnic as an example, we should deeply analyze the present situation of humanistic quality education during talents cultivation of customs declaration and international freight for "The Belt and Road", trying to find out the weakness and its cause.

4.2. Comprehensively demonstrate the necessity and feasibility of humanistic quality education reform in the specialty of customs declaration and international freight of higher vocational colleges in the background of "The Belt and Road"

On the basis of analyzing the weakness and cause of humanistic quality education during talents cultivation of "The Belt and Road" customs declaration and international freight, we should study the coupling mechanism of "The Belt and Road" construction and humanistic quality education, carry out the "humanities first" policy of "The Belt and Road" educational action, and demonstrate the necessity and feasibility of humanistic quality education reform in the specialty of customs declaration and international freight in the background of "The Belt and Road".

4.3. Construct the general framework of humanistic quality education reform scheme in the specialty of customs declaration and international freight in the background of "The Belt and Road"

We should deeply analyze the multilevel and multidimensional specific requirements of "The Belt and Road" construction for the quality of talents cultivation and humanistic quality education of higher vocational colleges, and based on this, with the adjustment of talents cultivation scheme, reconstruction of curriculum system and innovation of teaching mode as the key points, we should construct the general framework of humanistic quality education reform scheme in the specialty of customs declaration and international freight of higher vocational colleges in the background of "The Belt and Road".

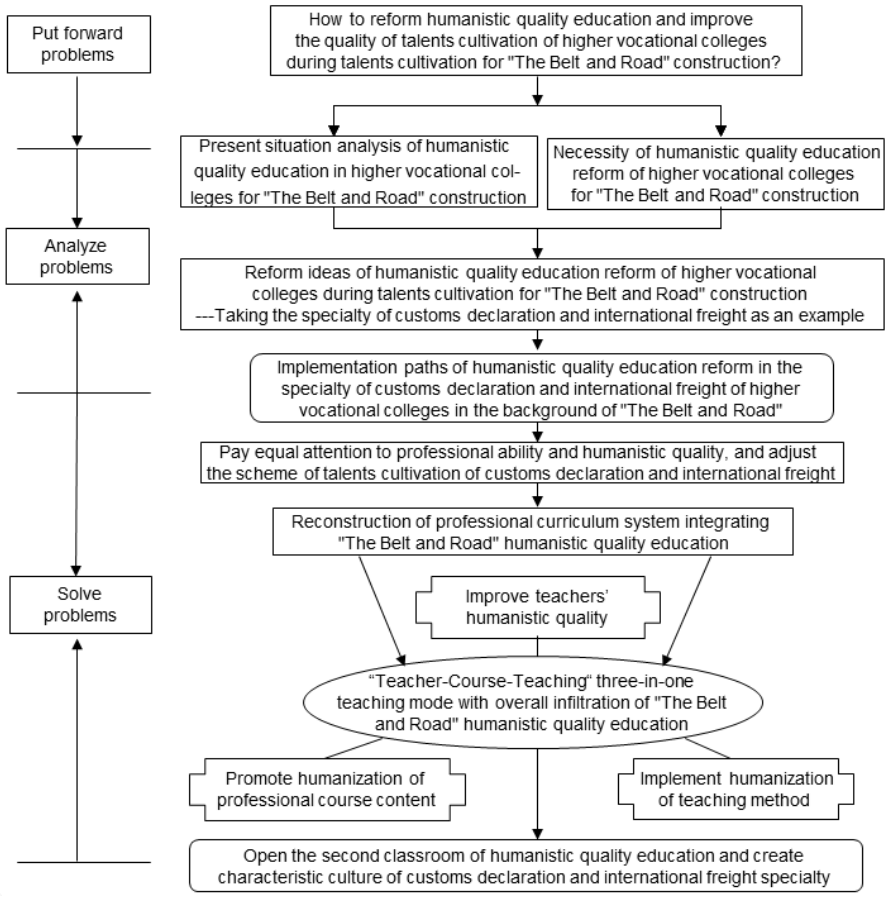

Figure 1 General framework of humanistic quality education reform scheme in the specialty of customs declaration and international freight

5. IV IMPLEMENTATION PATHS OF HUMANISTIC QUALITY EDUCATION REFORM OF HIGHER VOCATIONAL COLLEGES DURING TALENTS CULTIVATION FOR "THE BELT AND ROAD" CONSTRUCTION

5.1. Four steps

5.1.1. Adjust talents cultivation scheme. Taking the cultivation of "The Belt and Road" customs clearance and transportation talents with both humanistic quality and professional ability as objective, we can optimize the level, specification and orientation of talents cultivation, and adjust the talents cultivation scheme of customs declaration and international freight specialty.

5.1.2. Organically integrate "The Belt and Road" humanistic quality education and reconstruct the curriculum system of customs declaration and international freight specialty. Based on the specific requirements of "The Belt and Road" construction for cross-border customs clearance and transportation talents, with humanistic quality education as characteristics, we can construct the humanistic quality curriculum system covering the introduction of "The Belt and Road", international transport geography, professional English, international transport regulations and international business etiquette.

5.1.3. Promote the innovation and practice of professional teaching mode, and realize the overall infiltration of humanistic quality education. Improve teachers' humanistic quality and promote humanization of course content, so as to organically integrate historical culture, geography, language, law and customs of the countries along "The Belt and Road" into the relevant professional courses, thus realizing the humanization of course content, teaching method and teaching evaluation.

5.1.4. Open the second classroom of humanistic quality education and create characteristic culture of customs declaration and international freight specialty. Taking student associations (customs declaration and international freight association) as the leading role, we can invite experts from both inside and outside schools to participate in offering a lecture on "The Belt and Road" humanistic knowledge, organizing "The Belt and Road" humanistic exchange forum, carrying out "The Belt and Road" humanistic quality competition and other activities, so as to create a special culture of customs declaration and international freight specialty.

5.2. Two emphases

5.2.1. Reconstruction of professional curriculum system integrating the cultivation of "The Belt and Road" humanistic quality and customs clearance and transportation skills. Taking the cultivation of "The Belt and Road" customs clearance and transportation

talents with both humanistic quality and professional ability as objective, we should carry out the "humanities first" policy of "The Belt and Road" and construct humanistic quality curriculum system, thus integrating historical culture, geography, language, law and customs of the countries along "The Belt and Road" into the curriculum system, while through the study of the introduction of "The Belt and Road", situation and policy, international transport geography, professional English, international transport regulations, international business etiquette and other courses, we can master and understand the humanistic knowledge and humanistic methods of the countries along "The Belt and Road", so as to be equipped with humanistic spirit and thought of effectively participating in "The Belt and Road" construction. The professional curriculum system integrating the cultivation of "The Belt and Road" humanistic quality and customs clearance and transportation skills is shown in Figure 2.

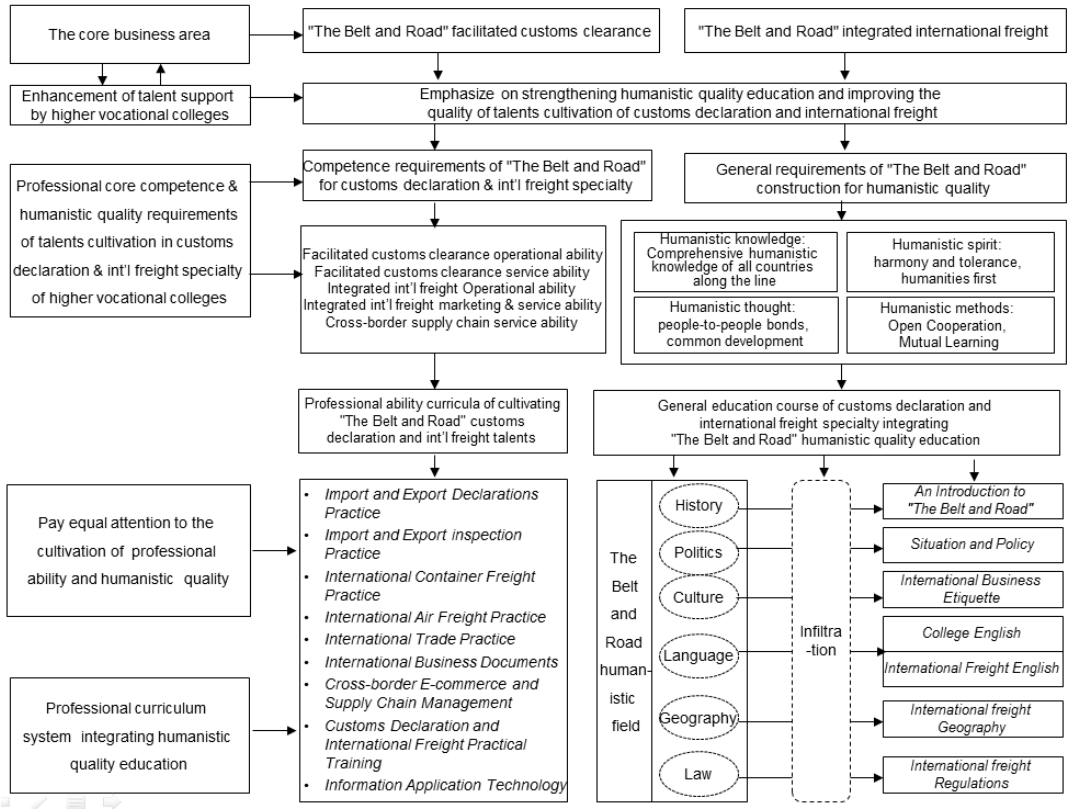

Figure 2 Professional curriculum system integrating the cultivation of "The Belt and Road" humanistic quality and customs clearance & freight skills

5.2.2. Professional teaching mode of "teacher-course-teaching" three-in-one with overall infiltration of "The Belt and Road" humanistic quality education. As the leading role in teaching activities, teachers should first improve their "Belt and Road" comprehensive humanistic quality through self improvement and further education; then they should implement the humanization of course content and closely combine "The Belt and Road" customs declaration and international freight business, so as to respectively integrate "The Belt and Road" historical culture, geography, language, politics, law and other humanistic contents into the corresponding professional courses, thus making students master the humanistic knowledge of "The Belt and Road" development situation and policy, international transport geography, professional English, international transport regulations, international business etiquette and others; on this basis, teachers can implement humanistic teaching process, adopt humanistic teaching methods and carry out humanistic teaching evaluation.

5.3. Two difficulties

5.3.1. Deeply analysis on the specific requirements of "The Belt and Road" construction for humanistic quality education. Only by accurately and deeply understanding the profound changes in the field of customs declaration and international freight business caused by industry transformation and upgrading in the background of "The Belt and Road", and deeply analyzing the specific requirements of relevant posts and tasks for vocational ability and humanistic quality, can we provide the powerful basis for the study and practice of carrying out professional humanistic quality education reform and improving the quality of talents cultivation in the background of "The Belt and Road".

5.3.2. The course design of humanistic quality education for customs declaration and international freight specialty in higher vocational colleges in the

background of "The Belt and Road". This difficulty concentrates on two aspects, while the first is the selection of contents of humanistic quality courses, including how to combine closely with the needs of this major and its subjects, and properly select and condense humanistic contents of "The Belt and Road" such as historical culture, politics and law; the second is the integration of contents of humanistic quality courses, including how to organically integrate the above contents with "The Belt and Road" situation and policy, international transport geography, professional English, international transport regulations, international business etiquette and other courses, so that students can understand and master the humanistic knowledge and humanistic methods of the countries along the line, thus being equipped with the humanistic spirit and thought of effectively participating in "The Belt and Road" construction.

6. CONCLUSION

Talent support is the key support of "The Belt and Road" construction, thus improving the quality of talents cultivation in relevant majors is the core task for higher vocational colleges to serve "The Belt and Road" construction, which requires the cultivation of professional ability and the enhancement of humanistic quality education and reform. This paper expounds the practical significance of humanistic quality education reform of higher vocational colleges during talents cultivation for "The Belt and Road" construction, and then by taking the specialty of customs declaration and international freight as an example and closely combing the requirements of "The Belt and Road" construction, puts forward the basic idea of humanistic quality education reform and constructs the general framework of reform scheme, and finally constructs the implementation paths of humanistic quality education reform, and puts forward four steps, two emphases and two difficulties, which provides the reference for higher vocational colleges to improve the quality of talents cultivation for "The Belt and Road" construction, and carry out the construction of relevant majors and education reform.

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Entrepreneurship Education, Social Capital and the Analysis of Factors of Graduate Students' Entrepreneurial Success

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Abstract: From the perspective of market research, graduates fail to gain obvious advantages in terms of current salary, job promotion and career satisfaction after graduation. The reason for this phenomenon, in addition to the lack of graduate students' innovation ability, also comes from the lack of graduate students' informal interpersonal behavior ability, that is, the lack of social capital for career success. Therefore, on the basis of the current situation survey, this paper reviews relevant literature, proposes a social capital model for the career success of postgraduates, USES the survey data for statistical analysis, and finally combines typical cases to build an innovative model for cultivating the employment and entrepreneurship ability of postgraduates' social capital accumulation.
Keywords: Entrepreneurship education; Graduate student entrepreneurship; Social capital; Entrepreneurial intention

1. INTRODUCTION

With the development of education and the advent of education industrialization and popularization, the scale of colleges and universities in China is gradually expanding .However, from the perspective of market research, no obvious advantages have been achieved in terms of current salary, job promotion and career satisfaction after graduation. The reason for this phenomenon, in addition to the lack of graduate students' innovation ability, also comes from the lack of graduate students' informal interpersonal behavior ability, that is, the lack of social capital for career success. The cultural tradition that Chinese society attaches great importance to interpersonal relationship makes social capital play an important role in the career success of postgraduates. Although some scholars have studied the influence of social capital on the employment of postgraduates, they still pay little attention to the successful research on the career of postgraduates, and seldom put forward the innovative mechanism of training mode to solve the problem of the lack of social capital of postgraduates. This paper focuses on the influence of graduate students' social capital on their career success and how to cultivate graduate students' social capital through the reform of graduate education mechanism in colleges and universities so as to improve their employment and entrepreneurial ability. In particular, it emphasizes the development and utilization of alumni resources, which is of great significance to the reform of education for graduate students. And through the cultivation of social capital to improve the success of graduate career is a relatively new problem. This is consistent with the policy of adjusting postgraduate education discipline and strengthening quality education.

Graduate entrepreneurship education, as an important way to cultivate high-level entrepreneurial talents, is of great significance to the implementation of China's national strategies of "innovation-driven development" and "demotion structure transformation and upgrading". At present, China is in a critical period of slowing economic growth and economic transformation and upgrading. A large number of high-level entrepreneurial and innovative talents need to be trained to promote the improvement of economic quality and the transformation and upgrading of economic structure. As high-level talents, postgraduate students' enthusiasm and efficiency in innovation and entrepreneurship can inject fresh blood and vitality into the national "mass entrepreneurship and innovation". Compared with developed countries, education and education of graduate student entrepreneurship still have the problem of low proportion of graduate student entrepreneurship. The main reasons may come from the higher proportion and better level of employment of graduate students, as well as the low willingness of graduate students to start their own businesses. However, it is obvious that the proportion of graduate students who start their own businesses is too low to meet the requirements of the whole society. Therefore, it has become an important content of strategic practice to explore the influencing factors of graduate students' entrepreneurship. At the same time, paying attention to the role of social capital can also expand the ideas and strategies of entrepreneurship.

Based on this, the significance of this research has two aspects: (1) theoretical significance: first, it can enrich the research results of social capital in China. Most of the research on social capital in China focuses on the rural population, laid-off workers, professionals and other groups, and pays little attention to the group of graduate students. As high-quality talents for the development of China, the

role of graduate students cannot be ignored. This research takes graduate students as the research object, conducts an empirical investigation and research on the current situation of graduate students' social capital, which can enrich the research results of social capital in China to a certain extent. Secondly, it can provide a new perspective for studying the relationship between social capital and graduate career success. Based on the previous research results, this study integrates weak tie theory [1], structural hole theory [2] and social resource theory [3], which are three different theoretical methods of social capital theory. Finally, the statistical analysis of this study also enriches the theoretical empirical literature on social capital for graduate career success. (2) the practical significance, the practical significance of this study can be divided into two aspects: on the one hand for graduate student, can let graduate students subjectively aware of the existence of individual social capital and its important role in the success of his career, so that can guide the graduate students to choose proper methods to obtain and accumulate their social capital. On the other hand, for the training institutions of the university, problems in postgraduate training can be recognized, and innovative training mode can be found to strengthen the cultivation of graduate students' employment and entrepreneurship ability. Finally, it can provide more competitive high-level talents for the society. This is also the purpose and direction of education reform of graduate students in institutions of higher learning. The innovative cultivation mode for the acquisition and accumulation of graduate students' social capital constructed in this study can be used as a reference for colleges and universities in formulating education reform plan.

2. RELEVANT RESEARCH TRENDS

2.1. Research on social capital and career success

The earliest research on the concept of social capital in China was conducted by Dr. Zhang Qizi [4], who was the first person who actually proposed and specifically studied social capital in China. His main research belongs to the category of social network research. On the one hand, he regards social network as an important relationship between people, and on the other hand, he regards social network as an important way of resource allocation .He thinks that social capital is formally a network of relationships. He also discussed the impact of social capital on economic growth, labor force transfer, technology and institutional innovation. After him, many scholars have joined the research team of social capital. According to Bian Yanjie and Qiu Haixiong [5], social capital is the relationship between the subject of action and the society and the ability to access scarce resources through such connection. Bu Changli believes that social capital is a social network formed through interpersonal interaction based on certain social relations, with certain culture as the internal code of conduct, and with the purpose of common benefits of certain groups or organizations. Yang Yongfu believes that social. Granovette [1] studied the role of social network relationships in individual job hunting. He found that when individuals used their social networks to find jobs, they were more likely to find jobs through weak relationships than strong ones. At present, many domestic researches are basically based on Granovette's network relationship research to expand and change. Most research has focused on "job success" rather than "career success." For example, Bian Yanjie and Zhang Wenhong found that in the Chinese world, strong relations are more important than weak ones. They believe that the social network of career migrants is mainly composed of strong relations between relatives and friends. The social network plays a role mainly in providing human favor and supplemented by information transmission, which is particularly prominent in the era of transition economy. Wang Guofeng pointed out that the role of social capital in postgraduate job-hunting is mainly manifested in four aspects: expanding the information possession of job seekers, obtaining more employment opportunities, laying a foundation for independent employment of postgraduates and saving job-hunting costs.

To some extent, the social capital of graduate students determines the tension that human capital can play its role. No matter how successful it is in obtaining professional status, the operation space of social capital in job-hunting cannot be covered up. Xu Xiaojun divided the critical value of social capital playing a role in college graduates. He thinks, below undergraduate course record, the contribution rate of social capital in obtain employment is higher than manpower capital; And above graduate student, social capital and manpower capital are acting jointly. He came to a conclusion that in order to effectively solve the employment problem of postgraduates, it is necessary to accumulate and cultivate their social capital. Zheng Xiaotao believed that the more weak relationships there were in the network, the more likely they were to get jobs through relationships. However, the quality of human capital does not affect how jobs are acquired. The higher the human capital, the less inclined it is to get jobs through the labor market. Among graduate students who got jobs through relationships, the higher the human capital, the lower the job satisfaction. The stronger the relationship, the higher the income level, the greater the span of network resources, and the higher the income level. Yan Fengqiao and MAO Dan made an empirical analysis on the influence of graduate students' social capital status on graduate students' graduation destination, employment fulfillment rate, starting salary and job satisfaction by using the survey data of "higher education scale expansion and labor market" research group of education college of Peking University. It is believed that in the reality

society, the employment information is massive and complex, the employment competition is intense. Therefore, social capital is very important for postgraduate employment. Graduate students should actively expand their social capital and strive for employment advantages during their study.

2.2. Research on the role of social capital in graduate employment and entrepreneurship

During the transition of college graduates' employment from the unified contract and distribution to the complete market-oriented reform, it is very important to explore the influence of social capital as a non-institutional factor on college graduates' employment behavior [6]. A large number of studies have explored the differences in the role of human capital and social capital in postgraduate employment from the perspective of "relationship" or "ability" [7]. Li Zeyu and Tan Zheng [8], the school professional category, work experience, is the human capital factors, factors of graduate employment force larger social capital factors in social capital accumulation is the employment of graduate student oneself force larger factors, graduate student less effect and influence of family social capital factors. Therefore, no matter from the perspective of human capital or social capital, the school's cultivation system plays an important role. And more scholars emphasize the role of human capital between the two, that human capital is the core of the employment starting factors [7], but it is clear that the graduate career success is not only a starting salary of an indicator can determine and also include the development and growth of follow-up, there was no doubt that let family based on individual social capital, social capital factors such as mentor, friend, alumni research at the level is more important [6]. Moreover, the network effect based on alumni resources is attracting more and more attention. Therefore, the theory of social capital for graduate career success can enrich relevant research literature. Meanwhile, the research on the training system for employment and entrepreneurship can highlight the importance of education in universities and provide a broader vision and thinking for the development of education for employment and entrepreneurship in universities.

Graduate students' innovation and entrepreneurship ability not only depends on their own active participation, self-exploration and self-development, but also needs the support of the external environment. The three dimensions of graduate students' social capital have different influences on the cultivation of innovation ability, among which, the social network positively influences the cultivation of innovation ability, the social relationship negatively moderates, and the common goal positively moderates [9]. As the main body of entrepreneurship, graduate students are affected by many factors, including the education knowledge of entrepreneurship acquired at school, education knowledge of entrepreneurship after entering the society, and the synergistic effect of different stakeholders encountered in the process of entrepreneurship. Postgraduates live and study in society, and have relations with various social subjects. The behavior of various social subjects naturally affects the cognition and judgment of postgraduates. Therefore, the more entrepreneurial activities and entrepreneurs a graduate student comes into contact with in his/her social life, the more recognition of entrepreneurial activities he/she will naturally have and the formation of various resources that are helpful to his/her entrepreneurial activities, which will naturally improve his/her willingness to start a business and the success rate [10]. Based on the theory of social capital, successful entrepreneurship requires effective input of resources, and the entrepreneurial process requires effective support from all stakeholders. Therefore, social capital factors for successful graduate entrepreneurship become particularly important. The role of the school cultivation system is also a topic that needs further discussion.

2.3. Existing literature review

Because social capital has strong explanatory power to real life, it has aroused a research upsurge in recent years. However, due to the complexity and diversity of the concept of social capital, the concept of social capital is controversial. Weak relationship theory focuses on the nature of relationships, structure-hole theory focuses on the relationship patterns among other individuals, and social resource theory emphasizes the characteristics of other individuals. The latter two theories both claim to be superior to the former [2,3]. But on the whole, the theory of social capital lacks systematic and theoretical discussion. The research on social capital theory in China simplifies the interpersonal relationship network and considers that the network is the relationship. To connect social capital with the "pull relationship" and "go through the back door" of Chinese society is simply to say that the relationship is social capital. This interpretation is one-sided, and the concept must be studied and grasped as a whole, or there will be great confusion. In fact, bad networks, such as nepotism and criminal gangs, are not social capital or the driving force for economic and social development of a country or region, but obstacles to social development. There are many research results on social capital and postgraduate employment, but most of them have the same conclusion and lack of originality. However, the research on the relationship between social capital and career success of graduate students with relatively high human capital ownership is still in a state of absence. Therefore, this study has a certain theoretical value of practical significance. More importantly, in the process of studying social capital, few scholars have studied how to accumulate social capital, that is, how to innovate and reform the cultivation mode of colleges and universities to

cultivate social capital for postgraduates.

3. RESEARCH THEORETICAL FRAMEWORK

Based on conservative cultural traditions and good expectations of the job market, the willingness of graduate students to start businesses is not strong enough, and they lack independent entrepreneurial impulse. A large number of graduate students flow into the job market, and the disadvantages of these employment behaviors are increasingly prominent.

First, it leads to the fracture of knowledge and skills, which restricts their full and stable employment. Because of the oversupply of the job market, both college students and graduate students are in the market. Therefore, in recent years in some areas of the graduate employment market has also been declining wages, employment levels and other problems. As a result, these graduate students will keep changing jobs. Under such circumstances, it is impossible for them to focus on a certain field and invest in specific assets, thus causing problems that cannot improve their career. Second, the lack of high-level entrepreneurial talents restricts the process and efficiency of "mass entrepreneurship and innovation" in China. Graduate students entering the entrepreneurial field as high-level talents can greatly improve the level of innovation and entrepreneurship, so we need to further strengthen efforts to encourage graduate students to carry out innovation and entrepreneurship; third, it may lead to the dependence of self-consciousness, weak subject consciousness, and restrict the space of self-development. It is not to say that the job market cannot improve the comprehensive ability of postgraduates, but it is obvious that they are dependent on a certain ability and basically revolve around others. And seldom pay attention to how an enterprise operates, manages, innovates and so on. This kind of loss of entrepreneurial subject consciousness makes it difficult to improve the comprehensive quality of graduate students, and the development of their career may also appear the bottleneck of complacency, unable to continuously improve their ability, expand the breadth and depth of career. Therefore, this paper attempts to empirically analyze the influencing factors of graduate students' entrepreneurial behavior, explore the main influencing factors of graduate students' entrepreneurial behavior, verify the effectiveness, practicality and implementation of incentive measures for graduate students' entrepreneurial behavior at the current stage in the country or region, and put forward policy recommendations.

There are many factors that determine graduate entrepreneurship, but the leading factor may be the cost of starting a business. That is to say, graduate students will pay more attention to the costs and costs they need to pay when starting a business, and then evaluate the industry or business activities they enter. Although this assessment is often inaccurate, it is clearly the most important part for graduate students to start their own businesses. Generally speaking, there are three types of cost factors: the first type of cost is capital, the difficulty of obtaining resources, or the capital and resource cost of starting a business. No matter which kind of entrepreneurial subject starts a business, the availability and disposable of capital and resources are the factors that cannot be avoided. Without funds or insufficient resources, it is impossible to carry out effective production and operation activities. At the same time, if the cost of obtaining these necessary conditions is too high, entrepreneurs will retreat from difficulties; the second type of cost factor is its own conditional cost. It refers to whether the entrepreneur has the quality and ability to start a business and the cost of acquiring these qualities and abilities. Imagine, if an entrepreneurs to realize that he will enter the industry with high demand for knowledge, psychological quality and ability, and to get the quality and ability to spend money and effort are themselves unable to afford, so will also start my own business in the field of the industry, will also choose the related business type? The third type of cost factor is the degree of economic development or system cost. Any an entrepreneur in front of the constraints, and control system, start a business of regional economic development level, openness, market degree of freedom to startup type selection of entrepreneurs and industry into people, high entry costs will be entrepreneurs to block outside the threshold, then for graduate student of start-ups, system of the cost of high and low for their effect will be even more so. Based on the division of these three types of costs, our research specifically divides the research field into three parts: entrepreneurial education, social capital and entrepreneurial intention. First of all, entrepreneurship education is a process in which schools provide students with individualized methods to solve social problems to create concepts and skills needed by social and economic values [11]. Graduate students' entrepreneurship education is the school through the dissemination of systematic knowledge to enable graduate students to master the skills of innovation and entrepreneurship, understand the process of entrepreneurship. Through the entrepreneurship education of the university, graduate students' entrepreneurial intention can be enhanced and their entrepreneurial spirit can be shaped. It is difficult for us to imagine how graduate students who know nothing about entrepreneurship can find strategic direction and effective methods of business operation in the changeable market. Therefore, the training of economic management and innovative and entrepreneurial thinking in school has become particularly important for postgraduate students. Moreover, the school also pays more and more attention to the investment of various entrepreneurial education knowledge, such as organizing students to participate in the challenge cup, research competition

and other practical activities, which greatly promotes the accumulation of entrepreneurial knowledge of students. Secondly, social capital can "give you opportunities to use financial and human capital by friends, colleagues or more generally outstanding" [2]. Obviously, social capital plays an incomparable role in the acquisition of social resources. No matter from the cognitive dimension, relational dimension or structural dimension of social capital, postgraduates are bound to be affected by these factors in the process of life and study. Therefore, these activities are conducive to obtaining resources that are helpful to entrepreneurial activities and can improve entrepreneurial intention. At the same time, the negative effect of some institutional barriers can be reduced. Finally, entrepreneurial willingness is an important reason for independent entrepreneurship, according to Maslow's hierarchy of needs theory. The need of innovation and entrepreneurship is the need of realizing self-value at the highest level. More entrepreneurial success is based on this positive entrepreneurial willingness. Therefore, the evaluation of entrepreneurial willingness is an important part of the evaluation of entrepreneurs' ability, as well as an important measure of whether entrepreneurs can achieve long-term success.

4. INVESTIGATION OBJECT, INDEX SELECTION AND ANALYSIS METHOD

4.1. Investigation object

The object of our survey is graduate students who have graduated from business school of GDUFS for more than 3 years. Questionnaire survey and interview method are adopted. We sent out 200 questionnaires to graduate students and recovered 109 questionnaires, accounting for 54.5%.Among them, 64 questionnaires were valid, with an effective rate of 58.8%.The industry distribution of valid questionnaires is shown in table 1.

Table 1 Industry distribution of valid questionnaires

Industry		Effective sample size	Ratio（%）
1	Agriculture, Forestry, Animal Husbandry, Fishing	11	10.092
2	Manufacturing Industry	7	6.422
3	Production and Supply	4	3.670
4	Building Industry	6	5.505
5	Transportation	9	8.257
6	Wholesale and Retail	13	11.927
7	Accommodation and Catering	2	1.835
8	Financial Industry	4	3.670
9	Resident Services and Other Services	6	5.505
10	Unknown	2	1.835
Total		64	58.716

4.2. Fuzzy determination method

Based on previous research results, we selected 10 important factors influencing graduate entrepreneurship. Firstly, the satisfaction degree of these 10 subjective and objective factors was evaluated by the graduate students. Secondly, the importance of these factors is evaluated by graduate students.

Set 10 influencing factors:

1) School entrepreneurship education refers to the situation of attending entrepreneurship courses, entrepreneurship competitions and entrepreneurship associations in school;

2) Social entrepreneurship education refers to the situation of participating in entrepreneurship training, competition and association in the society;

3) The dimension of social cognition refers to the confidence of graduate students to start a new career and achieve success;

4) Social relationship dimension refers to the position of graduate students in the relationship network and the degree of trust they have received;

5) The dimension of social structure refers to the consistency of goals between members and stakeholders of graduate entrepreneurial team;

6) Business management ability refers to the business management ability of the entrepreneurial team, the organization or the enterprise;

7) Entrepreneurship preferential policies refer to the current national or regional preferential policies conducive to graduate students' entrepreneurial behaviors;

8) Institutional restrictions that affect the degree of economic development, openness and market freedom of the regions where graduate students start businesses;

9) Training refers to paid or unpaid training for the skills or management knowledge of postgraduates;

10) Entrepreneurial consciousness refers to graduate students' entrepreneurial consciousness and entrepreneurial spirit.

Set the factor set X = {X1, X2...X10} represents the 10 important factors, respectively.

Set up evaluation:

Set Y. Using the expert opinion method, these 64 graduate students evaluate the current entrepreneurial environment with the above 10 factors, and set the evaluation as "good, good, general, not so good, not so good" five kinds of evaluation set: Y = {Y1, Y2, Y3, Y4, Y5}.Y1, Y2, Y3, Y4 and Y5 represent the

evaluation of the graduate students under investigation.

Single factor evaluation:

Experts are invited to evaluate the situation with 10 factors in the new period one by one. A single factor evaluation matrix R is obtained from the first two steps:

$$R = \begin{array}{c} \\ X_1 \\ X_2 \\ X_3 \\ \vdots \\ \vdots \\ X_{10} \end{array} \begin{array}{c} \begin{array}{ccccc} Y_1 & Y_2 & Y_3 & Y_4 & Y_5 \end{array} \\ \begin{pmatrix} r_{11} & r_{12} & r_{13} & r_{14} & r_{15} \\ r_{21} & r_{22} & r_{23} & r_{24} & r_{25} \\ r_{31} & r_{32} & r_{33} & r_{34} & r_{35} \\ \vdots & \vdots & \vdots & \vdots & \vdots \\ \vdots & \vdots & \vdots & \vdots & \vdots \\ r_{101} & r_{102} & r_{103} & r_{104} & r_{105} \end{pmatrix} \end{array}$$

4.3. Table of expert evaluation results

Table 2 Graduate students' evaluation of factors influencing entrepreneurial behavior at the current stage (satisfaction)

Influence Factors		Graduate Students' Ownership of These 10 Factors					Satisfaction Ranking
		Very good Y1	Better Y2	Ordinary Y3	No good Y4	Bad Y5	
1	School startup education	0.462	0.154	0.308	0.077	0.000	2
2	Social entrepreneurship education	0.000	0.462	0.385	0.077	0.077	4
3	Social cognitive dimension	0.538	0.077	0.231	0.000	0.154	4
4	Social relation dimension	0.000	0.231	0.154	0.385	0.231	9
5	Social structure dimension	0.077	0.154	0.231	0.308	0.231	8
6	Management ability	0.077	0.000	0.154	0.385	0.462	10
7	Preferential policies for entrepreneurship	0.077	0.154	0.308	0.231	0.231	7
8	Institutional restrictions	0.385	0.231	0.308	0.000	0.077	2
9	Training	0.462	0.154	0.154	0.000	0.231	6
10	Career Consciousness	0.615	0.077	0.308	0.000	0.000	1

Note: (1) This table adopts likert-type scale 5 rating method, and values 1, 2, 3, 4, 5 are assigned according to the degree of survey factors. (2) The score close to 1 indicates the lowest level, and the score close to 5 indicates the highest level, and then calculated according to the proportion of the score. (3) The descending ranking of satisfaction ranking is the sum of Y1 and Y2, that is, the ranking of better evaluation of the above levels.

Table 3 Ranking of importance of graduate students in influencing factors of entrepreneurial behavior (expectation)

(The Expectation of Various Factors) Influencing Factors		Average Significance Score	Standard Deviation	Weight	Order of Importance
1	School startup education	7.577	2.197	0.109	5
2	Social entrepreneurship education	5.769	2.251	0.083	7
3	Social cognitive dimension	8.308	1.974	0.120	1
4	Social relation dimension	4.346	2.633	0.063	9
5	Social structure dimension	8.308	1.393	0.120	1
6	Management ability	8.192	1.774	0.118	3
7	Preferential policies for entrepreneurship	4.538	3.072	0.066	8
8	Institutional restrictions	7.346	2.267	0.106	10
9	Training	6.846	3.555	0.099	6
10	Career Consciousness	8.000	2.082	0.116	4

Note :(1) In this table, the factors with the average significance score close to 10 are the most important, while those close to 1 are the least important. (2) The weight of each factor is equal to the significance score of each factor/the significance score of each factor. Represents the degree to which a certain factor influences the satisfaction of the graduate students' expectation of all factors. When the weight is 1%, it means that when the expectation of this factor is satisfied, it means that 1% of the expectation of all factors is satisfied. (3) The order of importance is descending order of the weight.

Using the formula $B = A \cdot R = \vee(ai \wedge rij)$ evaluation, we have:

$B = A \cdot R$=(0.109, 0.083, 0.120, 0.063, 0.120, 0.118, 0.066, 0.106, 0.099, 0.116)*

$$\begin{pmatrix} 0.462 & 0.154 & 0.308 & 0.077 & 0.000 \\ 0.000 & 0.462 & 0.385 & 0.077 & 0.077 \\ 0.538 & 0.077 & 0.231 & 0.000 & 0.154 \\ 0.000 & 0.231 & 0.154 & 0.385 & 0.231 \\ 0.077 & 0.154 & 0.231 & 0.308 & 0.231 \\ 0.077 & 0.000 & 0.154 & 0.385 & 0.462 \\ 0.077 & 0.154 & 0.308 & 0.231 & 0.231 \\ 0.385 & 0.231 & 0.308 & 0.000 & 0.077 \\ 0.462 & 0.154 & 0.154 & 0.000 & 0.231 \\ 0.615 & 0.077 & 0.308 & 0.000 & 0.000 \end{pmatrix}$$

After normalization: B = (0.296, 0.156, 0.253, 0.137, 0.168)

Evaluation results show that the present graduate student of various influence factors of the entrepreneurial comprehensive evaluation to the number of "very good" conclusion accounted for 29.6%, the number of "good" decision (15.6%), a total of 45.2%, the number of "general" decision evaluation (13.7%), and make "not good" and "bad" results in the number of graduate students accounted for 30.4%.

4.4. Evaluation and analysis of graduate students

Table 2 shows the evaluation of graduate students on factors influencing their entrepreneurial behavior at the present stage. The importance evaluation of each factor in table 3 reflects the expectation of postgraduates on this factor, and the satisfaction evaluation of each factor reflects the degree of satisfaction of postgraduates on this factor. The matching between graduate students' expectation and satisfaction can be divided into the following three categories:

From the perspective of graduate students surveyed, education has a significant impact on school entrepreneurship. It is obvious that education offers graduate students the opportunity to get in touch with entrepreneurship at an earlier age in both courses and practices. Wang, a student from Sichuan province, said the school's entrepreneurship program had made him an early discoverer of market opportunities. Recently he has been travelling between Guangdong and Sichuan to do research and start a new business. And the ability to take advantage of new knowledge, to start looking at the online shopping wave. This is also the source of their entrepreneurial confidence, which directly improves their entrepreneurial confidence and ranks among the top 5 influencing factors.

The dimension of social structure was evaluated as the most important factor by graduate students, ranking 1st. Graduate entrepreneurial team quality and entrepreneurial skills are often very high, but the trust between team members has become a very important issue. They lack the spirit of cooperation, so their satisfaction ranking is not high. There are also some graduate students who are conservative in their ideas, do not think about change, and are unwilling to accept new things. Single thinking mode, lack of pioneering; Narrow-minded, short-sighted, satisfied with the status quo. This lack of innovative thinking and passive inaction greatly restricts the entrepreneurial ability of graduate students. In the interview of graduate students, they show a strong entrepreneurial view, but the vast majority of them are still in a wait-and-see wandering state.

Most graduate students think that as long as there is a school business education can start a career. According to the survey, 64 percent of graduate students do not have the necessary skills to start a business, but have the passion to start a business. Social entrepreneurship education needs to be strengthened, and most graduate students expect to participate in more social skills training or further study. Obviously, education can promote graduate students' entrepreneurial intention, but entrepreneurship is not a temporary impulse. It requires long-term strategic planning and more social practice experience. Therefore, entrepreneurial experience is becoming more and more important in practice. In their work, they believe that knowledge level has little influence on them, and that satisfaction with technology and knowledge level is matched with expectation.

The restriction of the ability of operation and management results in the attenuation of entrepreneurial impulse of postgraduates. Relevant research shows that 90% of graduate students believe that management ability is the biggest difficulty in starting a business and one of the most prominent problems in the process of starting a business. Interview learned that family business is the main form of graduate entrepreneurship. Family management has wide adaptability and low risk. According to the survey, 75 percent of people in the process of starting a business first consider using family, relatives and community resources to start a business, 61 percent of graduate students in the process of starting a business encountered difficulties to seek help from relatives, 31 percent to the government, 8 percent to solve their own.

In the survey, graduate students generally said that business management is difficult, so the satisfaction with this factor is very low. Therefore, they pay more attention to the improvement of their operation and management ability, which ranks 3rd in importance. They believe that doing business mainly depends on years of management experience. Most interviewed graduate students are willing to accept social entrepreneurship training, so training ranks in the middle of the importance of influencing their entrepreneurship.

5. CONCLUSIONS AND RECOMMENDATIONS

The research results show that the five most important

factors influencing migrant workers' entrepreneurship are, in turn, social cognition dimension, social structure dimension, enterprise management ability, entrepreneurial consciousness and entrepreneurial spirit, and school entrepreneurship education. Among the factors examined, 40% met the expectation of postgraduates and 50% were lower than that of postgraduates.

Cultivating innovative talents is an important part of the national and social innovation system, and universities shoulder the responsibility of providing excellent innovative talents for the country and society. Therefore, teaching and research universities should fully mobilize their teaching, scientific research, management and other resources, and focus on the construction of postgraduate employment and entrepreneurship ability training system.

5.1. Improve the curriculum system for training talents for employment and entrepreneurship

1) Set up compound courses and pay attention to interdisciplinary courses. Through the opening of these courses, students can broaden their knowledge horizons and coverage. As a management postgraduate course, we should pay attention to the interdisciplinary of economics, management and sociology as well as the interdisciplinary of liberal arts and science and engineering. To improve the flexibility and operability of the curriculum arrangement, should not be too much.

2) Hold cutting-edge lectures to understand the development trend. Experts and professors should be regularly invited to give lectures on frontier knowledge in postgraduate classes, so as to guide students to pay attention to the development trend of the major, and at the same time to clarify the close connection between frontier development and basic knowledge, so as to pay attention to both the basis and the frontier, complement and promote each other.

3) Teach employment and entrepreneurship methods and understand the process of employment and entrepreneurship. There are methods for employment and entrepreneurship. Education, which pays attention to employment and entrepreneurship methods, is crucial to the cultivation of innovative talents. We should follow the objective law of employment and entrepreneurship, and set up relevant courses specifically for the methods and processes of employment and entrepreneurship, so that graduate students can understand and master the methods and processes of employment and entrepreneurship. At the same time to establish or strengthen interpersonal communication and other aspects of the curriculum.

4) Enrich humanities elective courses and improve humanistic quality. Employment and entrepreneurship literacy and humanistic spirit are inseparable. It is necessary to set up humanities courses to cultivate graduate students' employment innovation spirit and entrepreneurial consciousness, promote the organic combination of research literacy and humanistic quality, so as to sublimate graduate students' knowledge and skills.

5.2. Build a practical system for training innovative personnel

Graduate level study should be to practice for the development and support, more deeply involved in the practice activity to extensively, and inspection and learn basic and professional knowledge, can greatly encourage the graduate student's employment entrepreneurship interest and exploring spirit, improve the ability of solving practical problems, to master the scientific method, cultivation of employment ability. At the same time, through these practical activities, students can continuously improve their work experience, learn interpersonal communication skills and accumulate social capital.

1) Organize various practical activities at all levels with student science and technology competition as the leader. Efforts should be made to carry out science and technology competition activities with broad foundation, great influence of activities, complete organization mechanism and activity effect. To ensure that every graduate student has participated in at least one scientific and technological innovation activities and entrepreneurial practice activities in the university.

2) Build a student employment and entrepreneurship practice base based on various advantageous resources. We should integrate school and college resources, formulate relevant operational planning and organizational management systems, and equip teachers.

3) Cultivate students' scientific and technological innovation and entrepreneurial teams by participating in teacher research projects. Some small scale projects suitable for graduate students can be selected for innovation and entrepreneurial research under the guidance of teachers. Or encourage teachers to organize student teams for employment and entrepreneurship activities through the principle of voluntary participation.

5.3. Establish a cultural system for training people for employment and entrepreneurship

The cultivation of employment and entrepreneurship ability of management graduate students not only lies in classroom teaching and practical research, but also depends on the long-term edification and imperceptible influence of university culture. Under the basic premise of "employment and entrepreneurship" and "people-oriented", it is necessary to construct an employment culture system that is conducive to forming a healthy personality quality, critical entrepreneurial and innovative thinking, strong sense of employment and entrepreneurship, and harmonious innovative behavior.

1) Focus on creating a culture of graduate employment and entrepreneurship to promote long-term development. For students of different

grades and majors, different work plans should be formulated, and education jobs with distinct themes and various forms should be carried out step by step to continuously improve students' awareness of employment and entrepreneurship. We will build a service platform for exchange of students' employment and entrepreneurship, set up a website for students' employment and entrepreneurship, and strengthen information sharing and resource sharing.

2) Strive to improve the employment and entrepreneurship software and hardware environment for students and implement various guarantees. We will establish a sound system of incentives and financial support to train qualified people for employment and entrepreneurship. Through the construction of system culture, it provides effective guarantee for the cultivation of graduate students' employment and entrepreneurship ability.

ACKNOWLEDGEMENT

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Research on the Development Path of "School-enterprise Cooperation" to "Integration of Production and Education"

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Abstract: At present, the talent training mode of applied undergraduate colleges is still at a lower level of school-enterprise cooperation. It has not yet reached the ideal state of deep integration of production and education. The cooperation content is not deep, and the funds are not guaranteed, and the construction of the teaching staff is lagging. With this, the study deeply analyzes the definition of the integration of production and education pointing out that in order to meet the development needs of "integration of production and education", and it is necessary to construct a good operational mechanism, implement stable funding investment, and carry out innovative cooperation mode.
Keywords: School-enterprise cooperation; Integration of production and education; Development path

1. INTRODUCTION

With the adjustment and upgrading of the economic structure and the transformation of the economic development mode, China needs a large number of technical and skilled talents. Therefore, it is imperative to promote the structural adjustment of higher education. The Decision of the State Council on Accelerating the Development of Modern Vocational Education points out that it is necessary to speed up the construction of a modern vocational education system, and to guide the transformation and development of ordinary undergraduate higher education institutions. Guided by pilots, demonstrations and so on, to guide a group of ordinary undergraduate institutions to applied technology-type higher education institutions with a focus on undergraduate vocational education. It is an inevitable trend for local ordinary undergraduate colleges as the backbone of higher education popularization to transform into applied technology colleges.

2. UNDERSTANDING INTEGRATION OF PRODUCTION AND EDUCATION SCIENTIFICALLY

For colleges and universities, the integration of production and education is not an expedient measure for development. It is not a form, but a long-term strategy and leading model for talent cultivation. Only by continuously promoting the integration of production and education, conforming to the tide of national economic restructuring and the transformation of economic development mode, deeply integrating into local leading industries and serving local social and economic development, can we create characteristics and achieve a level to better develop and grow. For the industry and enterprises, talent is the key, and the application-oriented talents that are well-used and practical with the company's own characteristics can only be cultivated by in-depth cooperation with universities. Therefore, if enterprises want sustainable development, they must abandon short-sighted behavior and dare to make long-term investment [1]. They must actively engage local universities, invest in human, material and financial resources, promote the integration of production and education, support the development of local colleges and universities and cultivate applied talents. For the state and the government, only by deepening the integration of production and education can we improve the level of transformation and development of local undergraduate colleges and universities, and promote the healthy development of vocational education in China [2].

3. IMPROVING THE INSTITUTIONAL MECHANISM OF THE INTEGRATION OF PRODUCTION AND EDUCATION

(1) Building a good operating mechanism

If the cooperation between local application-oriented universities and enterprises is to be deeper and longer lasting, a good cooperative operation mechanism must be established. Vocational education group is a good platform for school-enterprise cooperation. Through this platform to carry out inter-school cooperation, integration of production and education, school-enterprise cooperation, institutions and industry associations, scientific research institutions, can optimize resource allocation, achieve resource sharing. To construct a vocational education group, it is necessary to improve the corresponding joint institutions, the board of directors and other governance institutions and decision-making mechanisms, and to establish a good operating mechanism for school-enterprise cooperation and integration of production and education. Both schools and enterprises should base their research on the basis of cooperation [3]. Strictly managing and monitoring all aspects of school-enterprise cooperation, and

ensure the quality of school-enterprise cooperation, such as on the basis of full investigation, strengthening the system construction and quality standard system construction, building a quality assurance system, formulating professional talent training program, constructing curriculum material, constructing laboratory, constructing double-faculty faculty, guiding graduation design.

(2) Implementing stable funding

In order to ensure the smooth development of the integration of production and education, the central and local people's governments at all levels shall arrange special funds for the cooperation and development of vocational education between schools and enterprises in the fiscal budget to support the development of vocational education, school-enterprise cooperation and the special funds in accordance with the requirements of the regulations. It should grow gradually with the development of economy and society [4]. The central and local people's governments at all levels shall encourage enterprises to cooperate with vocational colleges to carry out employee training. The expenditures on employee education that occur may be deducted in accordance with state regulations when calculating the taxable income of enterprises and encourage enterprises to absorb internships from vocational college students [5]. Financial institutions are encouraged to improve financial services, and school-enterprise cooperation credit business is encouraged, and commercial insurance companies are encouraged to jointly launch vocational internships for vocational colleges to strengthen the internship students in vocational colleges.

(3) Carrying out innovative cooperation mode

The difference in talent training objectives and specifications determines that the application-based undergraduate school-enterprise cooperation cannot copy the model of higher vocational colleges, but there should be different. For example, the order-based training model of the school-enterprise joints often used by higher vocational colleges is not suitable for the training of talents in applied undergraduate colleges, because this training mode is highly targeted and focuses on the requirements of vocational skills training. For the purpose of application, it pays attention to practicality. However, the talents cultivated by applied undergraduate colleges should have a broader theoretical basis, and should focus on the training objects when constructing the curriculum system. On the basis of inheriting and discarding the original model, the school-enterprise cooperation mode of local application-oriented undergraduate colleges should continue to innovate according to its own advantages, such as co-constructing science and technology research and development centers with enterprises, and jointly carrying out scientific and technological research and project cooperation [6].

4. CONCLUSION

With the strengthening of the integration of production and education, universities should take the initiative to establish closer cooperation with local governments, industries and enterprises, listen to their voices, understand their needs. The integration of production and education and school-enterprise cooperation will be implemented at all levels of school management and teaching, and will be integrated into every system, every major, every course and every teacher, so that the school becomes an industrial university or a city university.

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Exploration of Teaching and Practice Reform of *Software Test Management*

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Abstract: In this paper, the necessity of offering the course of test management is analyzed in the software testing direction for software engineering specialty. Then the specific setting of the course is discussed as well as the design and implementation of its theoretical and practical teaching. Such strategies are put forward as introducing case-based teaching, forming students' test teams, standardizing software test process, and making full use of test management tools in order to promote the formation and development of software testing and test management ability. So students can be more quickly competent for software testing related positions in the future.
Keywords: Software Testing; Test Management; Course Reform

1. INTRODUCTION

Software testing is the key means of software quality assurance. With the rapid development of China's software industry and the continuous expansion of users' requirements for high software quality, the demand for Software Testing Talents in China is also increasing [1]. In the past, domestic enterprises did not pay enough attention to testing, resulting in a small number of test practitioners and relatively large changes in personnel. But it is impossible for software enterprises to be strong without excellent software quality and software maintenance [2]. Now more and more software enterprises have realized the importance of software testing, and established independent software testing or quality assurance departments, learning and adopting advanced testing technology, and constantly improving software development process. However, compared with international standards, there is still a big gap in software testing in domestic software enterprises, especially in management, which is relatively simple and arbitrary [3]. And there is no standardized and effective software test management system. In addition, lack of support from automated tools, most software enterprises do not use software test management system in testing. And their work efficiency is not high [4].

Now there are few courses or training on software test management in colleges and universities. The common practice is to introduce it as a chapter of software engineering or software testing course. This kind of teaching arrangement may unintentionally make students confine their understanding of testing to 'finding bugs'. They cannot deeply understand and master the knowledge and skills of test management. It weakens students' understanding of the importance of software test management and even the importance of software quality assurance. It is not conducive to cultivating students' practical operation ability and management concept of software testing specialty [5]. Moreover, because this course has not been offered in other universities and training institutions, there are few lessons to learn from and no suitable textbooks to choose. The characteristics of software test management are abstract theory and strong engineering practicality. The traditional teaching mode is based on theory teaching and knowledge elaboration, supplemented by practice operation, with teachers as the subject of the teaching process, which is not conducive to the combination of theory and practice and the cultivation of students' engineering practice ability, nor is it suitable for the teaching of this course.

So we have developed and constructed the *Software Test Management* course in the software testing direction for software engineering specialty. And we started teaching practice with Grade 2010 students. Since the first teaching implementation of this course in 2013, our teaching team has adjusted the teaching contents and course organization every year according to the feedback in the previous year as well as the changes of the industry application. Statistics show that good teaching results have been achieved.

2. CURRICULUM SETTING

The basic courses of software engineering undergraduates in the 1st to 4th semester are the same as those of computer science and technology students. Students must take all compulsory courses, including those from *the public education platform*, *the general course platform* and *the professional course platform*. The optional courses of the professional course platform can be taken by students freely. These courses are divided into two cultivating directions, namely, the *software testing* direction and the *software development* direction. According to the exploration and practice of the past students and the investigation and research of other colleges, five specialized courses have been set up in the direction of software testing in our department, as shown in Table 1. Among them, '*Software Testing and Quality Assurance*', '*Software Testing and Quality Assurance Course Design*', '*Software Testing Project Case*

Analysis', '*Software Testing Tools and Practice*' mainly focus on training the testing skills required by software testers, while '*Software Test Management*' course mainly trains the professional ability of testing management required by testers.

Table 1 Courses Offered for Software Testing Direction

Course Name	Class Hour	Credit	Semester	Category
Software Testing and Quality Assurance	58	3	5	compulsory
Software Testing and Quality Assurance Course Design	32	1	6	elective
Software Test Management	38	2	6	elective
Software Testing Project Case Analysis	24	1.5	7	elective
Software Testing Tools and Practice	32	1.5	7	elective

3. THEORETICAL TEACHING

(1) Teaching content design

The theoretical teaching for the *Software Test Management* course is organized as the following 7 parts.

a) Overview of software testing. This part introduces the general process and related specifications of software testing, the elements of software test management as well as a systematic approach to test management.

b) Test preparation. This part introduces the determination of test strategy, the formulation and execution of test plan, test design and development.

c) Test execution. This part introduces how to build a test environment, execute tests, view test results, study and organize the evaluation of test results, record and track software defects.

d) Test analysis. This part introduces the measurement and analysis method of software defects and testing process, and the generation of software test report.

e) Other activities of test management. During the general process of software testing there are also some supporting activities of test management, such as test organization and personnel management, configuration management, test schedule management, communication management, environment management and risk management.

f) Standards and test process improvement. This part introduces the relevant international and domestic test standards, the process and main content of test process improvement, as well as the typical test process improvement models.

g) Testing tools and automation. This part introduces the characteristics and functions of various kinds of testing tools, especially those test management tools. And a typical test management tool called Quality Center is expounded with specific examples.

(2) Teaching Modes

Several teaching modes are used together in the test management course, such as lecturing, self-study and discussion, simulated class, mixed online learning.

a) Lecturing. 16 class hours are used for classroom teaching. Under the premise of systematically teaching the main process of test management in this course, teachers should highlight the three main aspects of test management, which are test process management, test team management and test technology management. Pay attention to defect management and analysis, so that students can understand the basic methods of test process improvement and optimization. The textbook we use marks the contents of each section as one of these four levels: *remembering*, *understanding*, *application* and *analysis*. Teachers can refer to them when they teach. The course content needs to be combined with the application part, hoping that students can apply what they have learned to their own testing process.

b) Self-study and discussion. In the 8 hours of research-based teaching and self-study time, students are required to study independently the teaching materials and the information provided by teachers, make summaries, raise questions, exchange ideas and have discussions among themselves. In addition, for convenience of discussion, teachers can divide the whole class into several study groups or discussion groups in advance, with about five students in each group which can be the same with test teams in practice teaching of the course.

c) Simulated class. In the process of teaching, teachers can select a few appropriate teaching chapters and invite some interested students to give lectures after their careful preparation using the theoretical knowledge they have learned. Lecture time should be limited to 10-15 minutes. Teachers and students will comment and provide advices and suggestions according to the lecturer's performance afterwards.

d) Mixed online learning. This course is also offered online. Teachers can publish course requirements, learning tasks, questions, multimedia courseware and reference materials on the course website of the Academic Affairs Department. According to teachers' requirements, tasks and questions, students can make use of online materials and other resources to conduct self-study and organize discussion in advance, and give the results of learning to teachers in the form of online reviews or in written form. Teachers can use that as a basis for assessing students' usual performance.

4. PRACTICE TEACHING

Experiment and Practice is an important and necessary procedure for students to learn software test management. Through the delivery of experimental courses, students can obtain comprehensive practical training in test management, so that they can review the teaching contents of theoretical courses from the perspective of application and deepen their

understanding about it. Furthermore, students master the general process and methods of software test management described in this course through real case practice and computer operations. And they learn to use at least one software test management tool, such as *Quality Center* (abbreviated as *QC*), and gradually become a qualified test manager.

Practice teaching is driven by real complete projects. For example, a specific OA system used in a certain university is introduced into teaching activities, which decomposes knowledge points into the project testing and its various tasks. Those projects developed by students themselves can also be adopted in order to stimulate students' enthusiasm and initiative. At the beginning of each software testing course in the curriculum, students are instructed to form different testing groups, each consisting of 4 to 6 members. All the groups then simulate regular test teams in software companies to carry out their testing work. They can play the role of a test manager, a tester or a programmer respectively. They can also exchange roles at any time to experience all kinds of testing tasks in an all-round way. It cultivates students' skills in various test positions. When testing the systems developed by students themselves, they constantly find defects, repair defects, analyze and summarize them, so that testing activities can be carried out continuously and dynamically.

Practical teaching of the test management course is described as follows.

(1) Introduce the installation, basic interface and regular operations of *QC* which is a well-known and commonly used test management tool. Core functions of *QC* are demonstrated, such as background management, foreground management and project customization management, with the example of a specific OA System.

(2) Each group is required to formulate the test requirements document according to the given test requirements template on the basis of analyzing, discussing and sorting out the software requirement specification of their self-developed system. Then they may simulate the test requirement review meeting. Group members play the roles of a review meeting respectively to check the test requirements. After the document has been passed, each requirement and sub-requirement are added to the *QC Requirements* module accordingly. Thus the test requirements are transformed into tests and a *QC* test requirement tree of the project is generated.

(3) The test manager of each team determines the test strategy, organizes all the test resources, creates the schedule, and finally generates the test plan document. After a verification process, the approved test plan can be published on the *test plan* module of *QC*.

(4) Test team members design test cases according to the test plan. And they can add detailed descriptions of the test cases for each test in the *QC Test Plan* module. After the design of test cases is completed, the information of all the *QC*-managed test cases in the project can be exported to a specific format of document, which will then be reviewed by team members under the organization of the test manager. After it is passed, the set of test cases is basically fixed.

(5) When the test environment is set up, team members execute test cases on the system under test according to the assignment of test tasks. And they can manage the execution process and record the executing results of test cases in *QC* using its *Test Lab* module. In this stage, all the defects found are registered and submitted respectively by testers. Those submitted defects will be automatically added to the *Defects* module of *QC* which is mainly responsible for defect management.

(6) Each test group uses the *Defects* module of *QC* to assign and track all the defects of the project. And different kinds of statistical analysis of various defects can be carried out to help to evaluate the quality of this version and generate test reports.

14 class hours are arranged for practice teaching along with 8 hours of after-class discussion time. The class hour distribution is shown in Table 2.

Table 2 Class Hour Distribution of Practice Teaching

No.	Task	Artifacts	Class Hour
1	Environment building		4
2	Test Requirement Management	Test requirements	3
3	Test plan management	Test plan	2
4	Test case management	Test cases	4
5	Test execution	Defect list	4
6	Defect management		3
7	Test evaluation	Test report	2

Through the study of this course, students will master effective methods, processes and tools of software test management including test process management, test team management and test technology management. They are expected to be able to formulate test plans, decompose testing work, rationally arrange test schedules, estimate risks, manage tests, track defects and organize test teams.

5. COURSE ASSESSMENT

For course grading, the above testing tasks and associated position roles are considered. Both work process (50%) and work results (50%) are assessed to give an overall evaluation of students' performance in this course. Work process assessment includes students' accomplishment of tasks, their attitudes and work styles in each teaching task. It adopts a combination of students' self-assessment, mutual assessment and teacher evaluation. Work results assessment is based on the technical details of all the artifacts submitted by each group as well as the task allocation among group members.

6. CONCLUSIONS

The direction of software testing is a popular professional direction in recent years. It has a large demand for personnel and a good working prospect. *Software Test Management* is a necessary specialized

course for software engineering undergraduates, especially those in software testing direction.

In this paper, the specific setting of the *Software Test Management* course is discussed as well as the design and implementation of its theoretical and practical teaching. Such strategies are put forward as introducing case-based teaching, forming students' test teams, standardizing software test process, and making full use of test management tools in order to promote the formation and development of software testing and test management ability. So students can be more quickly competent for software testing related positions in the future.

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Research on College English Reading Teaching based on Schema Theory

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Abstract: In College English teaching, the improvement of students' reading ability is a prominent problem in the teaching mode of College English. However, as far as the current situation of College English reading teaching is concerned, the teaching of text reading has not been fully paid attention to, and the students' reading comprehension ability has not been improved clearly. This paper, starting with the present situation of College English reading teaching, will guide the teaching of reading in College English by graphic theory, and the relationship between theory and practice, and studies the correct teaching methods of improving students' reading ability based on graphic theory.
Keywords: Application of schema, Theory in college, English reading, teaching

1. INTRODUCTION

Reading is the most direct and effective way for human to acquire language knowledge, and is also a process of comprehensive utilization of language. The teaching of College English discourse reading has always been the focus of foreign language teaching. In the College English syllabus, it is clearly pointed out that the students have a strong ability to read and understand, a certain ability to listen and translate, and the ability to write and speak. The purpose of College English reading teaching aims to cultivate students to have a certain knowledge of Chinese and Western culture, to lay the foundation for students' ability to read, read, write and translate, and to cultivate students' ability to cross communication. This paper, guided by the theory of schema, discusses the application of schema theory to the teaching of English text reading in College English, how to improve students' cognitive awareness in teaching, activate and enrich the schema network in the students' minds, and improve students' reading ability in English [1-3].

China has issued an outline of English teaching, the syllabus of College English, which has a clear definition of reading: "reading is an important channel for mastering language knowledge, making good language foundation and obtaining information". Reading ability is a skill that every graduate should have. It is widely used in work, life and interpersonal communication. In recent years, with the deepening of economic globalization, English has been used more widely, and English reading ability is a necessary skill for non-English Majors in every university. English reading is an important tool for college students to obtain British and American culture and English language. It has always been teaching in college teaching. The key content of the study. In the practical teaching practice of College English, many English teachers in Colleges and universities have been exploring the teaching mode which helps to improve the students' English reading ability. There have been a lot of teaching modes about English reading in foreign countries, and some remarkable achievements have been made. However, the non-English major in our country has been made in China. The practice and research of reading teaching is still not systematic, and there is still no high-quality reading teaching mode. Although English teaching should include the teaching of English reading, in practical teaching, different teaching modes should be adopted because of the different teaching objects. This paper, mainly from the development of English reading mode, briefly analyzes the classification and function of schema theory, hoping to help students improve their English reading ability through the analysis and study of this paper, and thus improve the effectiveness of reading teaching in Colleges and universities [4-7].

2. READING MODE

2.1. Threekindsofreadingmodes

There are three kinds of reading modes: "top-down", "bottom-up" and "schema". In the process of reading comprehension, three modes will be used. The first "top-down" refers to the process of turning words into simple ones. The drawback is that the reader puts his attention on the decoding text, unable to think actively, and passively accept the information. The second "bottom-up" refers to the process that readers can contact the relevant cultural background knowledge and use their own logical reasoning ability to conjecture and verify the reading content by one by one. The drawback is that students may guess too much, leading to a far cry from the original meaning. The third "schema" refers to the use of the first two methods, which can help readers to fully display their skills in the process of reading, let the readers understand and absorb the new knowledge in the existing knowledge, and then further verify the contents of the text or overthrow the guesswork according to their own guesses (Liu, 2017). This model enables students to accumulate new knowledge in the process of reading comprehension, to establish a rich knowledge framework, and to link the learning

background with the reading information that is consistent with them, so that the reading text can be understood more easily, comprehensively and correctly.

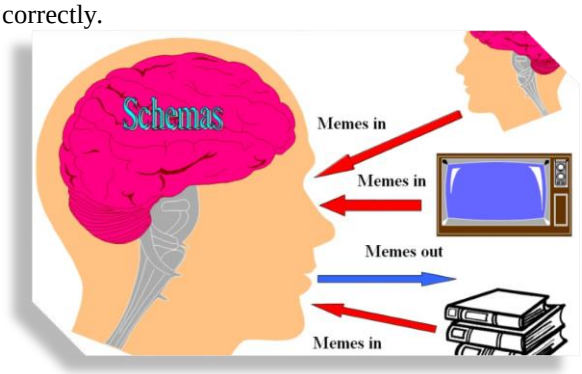


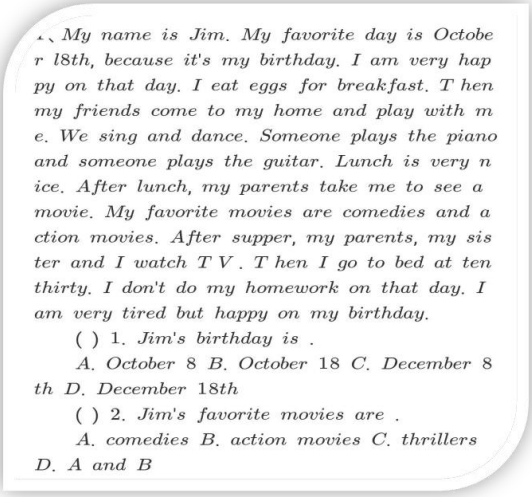
Figure 1.Image processing system of human brain

2.2. The development of English reading mode

In 1960s, Laberge, Gough and Samuel et al. Read English reading as a pattern, basically the process of teaching in terms of letters to words, words to phrases, phrases to sentences, sentences and then to text. In the course of teaching English reading, teachers should pay more attention to the basic units of the text, start from the basic units of English words, pay more attention to the explanation and analysis of English vocabulary, and put the emphasis on some superficial knowledge, such as words and grammar in the understanding of the text, and master the content of the whole text. In general, this is just a kind of teaching method which is not comprehensive. Moreover, the teaching of English reading mode is slow, and its accuracy is not high.

In 1967, Goodman also made an additional analysis of English reading in the Journal of the reading expert. Reading is a kind of unknown conjecture. Then it puts forward a completely opposite teaching model, "top-down" English reading mode. In this teaching model, it is more important to read the original knowledge of the reader. On the basis of their own knowledge system, from the word level, the content of the article is predicted, assumed and verified step by step, and the main connotation and deep meaning of the article are gradually obtained.

In 1980, D. E. Rumelhart, an American artificial intelligence expert, combined with the above two concepts, and proposed a more comprehensive reading pattern. This reading pattern is a schema theory that this article will study. The central point of this theory is that English reading needs to be used to read all the knowledge of the reader, whether it is language knowledge. Knowledge, or content knowledge, makes readers' knowledge and reading materials interact with each other. The schema theory does not attach importance to the form and content of the material to be read. Whether oral or written, these reading materials do not have an important meaning. The content of the material only needs to follow the knowledge, content and structure that the reader has already had in the reader's brain, and then transform it into a certain meaning. Schema is an existing unit of knowledge in the human brain. Schema theory is used in English reading. The reader needs to receive some signals or information in advance, and then find all the schemata corresponding to them in their own knowledge system. When all the schemata are collected, all the schemas collected are used. Read these signals or information. After this process, readers have a deeper understanding of reading articles. When the reader combines the schemata that has been formed in the brain and the article that needs to be read, it is easier to understand the true meaning of the article, so that the author's real intention can be grasped by the reader. Otherwise, the reader's reading will be meaningless. Carrell and Eisterhold have such an explanation for schema theory, "The Policeman held up his hand and stopped the car.", which is actually an important role of schema theory. The reader is likely to have such a pattern: when a traffic policeman raises his hand to the driver to express the parking information, the reader will form a corresponding understanding: the traffic policeman raises his hand to ask the driver to stop, and the driver stops the message immediately, or stops the car slowly on the roadside. When the reader sees these words trying to understand them, the schemata in the reader's mind are stimulated, and all the problems that appear in English reading can be dealt with (Li, 2017).



、My name is Jim. My favorite day is October 18th, because it's my birthday. I am very happy on that day. I eat eggs for breakfast. Then my friends come to my home and play with me. We sing and dance. Someone plays the piano and someone plays the guitar. Lunch is very nice. After lunch, my parents take me to see a movie. My favorite movies are comedies and action movies. After supper, my parents, my sister and I watch TV. Then I go to bed at ten thirty. I don't do my homework on that day. I am very tired but happy on my birthday.

( ) 1. Jim's birthday is .

A. October 8 B. October 18 C. December 8th D. December 18th

( ) 2. Jim's favorite movies are .

A. comedies B. action movies C. thrillers D. A and B

Figure 2.Example of English reading

2.3. The current situation and problems of College English Discourse Reading Teachings

The traditional teaching mode of College English reading course is mainly centred on teachers, textbooks and teaching. The emphasis of the teaching is to explain the vocabulary and grammar knowledge and cultivate the language ability. From the beginning of words, from words to phrases, sentences, and then teach students how to judge the author's intention in the article. In a class, teachers spend a lot of time explaining the use of vocabulary, grammar and

sentence patterns, but let students train their cognitive ability, logical thinking ability and related background knowledge. In this teaching class, students' subjective initiative in the understanding of articles cannot be brought into play, and they only passively accept knowledge. This leads to students' understanding of the article and the understanding of the surface structure of the article. Secondly, in classroom teaching, teachers neglect the cultural background knowledge involved in the text. To truly learn a language and fully understand the meaning of a foreign language, we must understand the culture contained in this language. Language and culture can't be disjointed. The current college English teaching, in the teaching of text reading, seldom persists in effectively linking language and culture to teaching. Therefore, students lack background knowledge in text reading, and the understanding of many articles will produce deviations, and it is difficult to resonate with the author, thus forming reading barriers. This teaching situation will lead to students' decline in learning consciousness and initiative, slow reading speed, weak sense of discourse and poor logical thinking ability, and there are obstacles of language knowledge, background knowledge and discourse pragmatics in the process of reading.

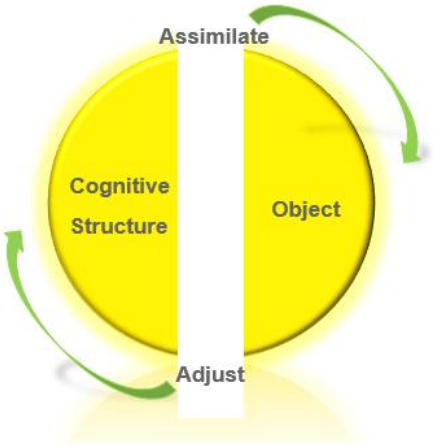


Figure 3.Adaptation process

3. SCHEMA AND SCHEMA THEORY

3.1. The definition of Schema Theory

Schema is an abstract structure of knowledge. It provides for a general and desired arrangement of information. Schema can also be defined as the dynamic organization of people's past experiences in the brain. Schema is a cognitive structure of specific things or concepts developed through cognitive experience. It is formed by the integration and analysis of new information on the basis of previous experience. The modern schema theory was developed in the late 70s of this century through the efforts of many scholars such as Goldman, Room Hart, Piaget, and Carlo, and was used in reading.

According to schema theory, reading this complex cognitive process involves the continuous interaction process between readers' schemata and textual information. It emphasizes the construction of meaning in reading, the key role of readers and the interaction between text and reader's background knowledge. Schema reading theory mainly includes language schema, content schema and formal schema. Therefore, in order to understand the article correctly, readers must have the schema corresponding to the article, and at the same time, activate the schema in the process of reading (Graziano & Webb, 2015).

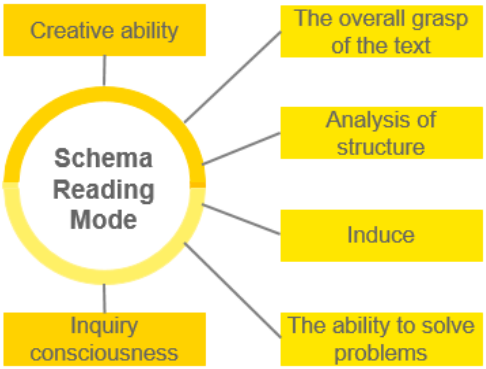


Figure 4.Schema Reading Mode

3.2. The Classification of Schema Theory

In the schema theory, there are three important types of schema which have an impact on English reading. The three types of schema are the content schema, the language schema and the formal schema. Among them, content schema is the reader's background knowledge about reading materials, which is a basis for readers to understand materials. There is an inevitable connection between the master of the background knowledge and the life experience of the reader. In the course of reading, there will be a certain association and resonance. The language schema is mainly about the teaching of English grammar, such as the spelling, the sentence pattern, the connection and so on. The Basic English knowledge required by the learners is also an important foundation for learning English. In English reading, the reader needs to read the material in its grammatical knowledge structure, such as the reader's specific analysis of the words in the material and the structure of the sentence pattern. If readers do not have a certain language schema, English reading will become very difficult. Therefore, non-English majors need to form a certain language schema; formal schemata are mainly related to the structure, stylistic form and register of reading discourse, and the mastery of the style of reading discourse is also beneficial to the reader to understand the article better. Many studies abroad have confirmed that the structure and form of reading materials have a certain impact on students' reading (Starr & Zurbriggen, 2016).

In reading the article, many students will see that some words and sentences will be connected with the schemata in their mind. Some details in the reading material and the schemata in the students' mind interact. The student's schema will resonate with the author in the mind. This is the first of the students to

understand the article. Step. Therefore, reading teaching for students not only requires students to grasp the style of materials, but also needs to use existing experience to analyse and judge this article. In English learning, in fact, a person's life experience is also very important. The experience accumulated in the students' daily learning, whether it is the knowledge system or the life experience, will help the reading of English. The accumulated experience will provide the students with a background of knowledge, the students will read the material. Materials are placed in their knowledge background, and fill in some small details that may be missing in their reading materials with their own knowledge and experience (Hedblom, 2015).

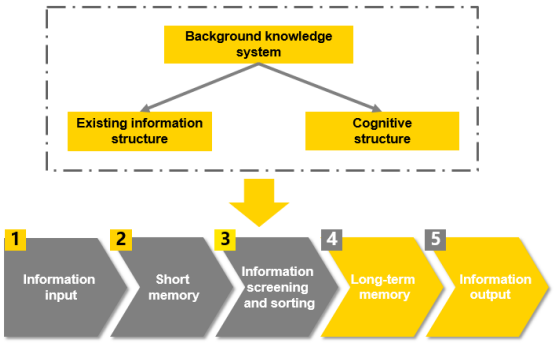


Figure 5.The process of reading information processing

4. APPLICATION OF SCHEMA THEORY IN COLLEGE ENGLISH READING TEACHING

The schema theory holds that the meaning of a text does not exist in the text itself, but in the schema that exists in the reader's mind, which is endowed by the reader, and the different readers can give different meanings to the same text according to their own schema. Therefore, in the practice of College English reading teaching, teachers should consciously mobilize the schema in the students' mind, help the students to build the schema actively, activate the original schema and actively establish various new schemata, so as to achieve the purpose of improving students' reading comprehension ability. Teachers should change from the knowledge imparting person to the learner promoter. According to schema theory, the more schemas in the reader's brain, the more accurate and thorough the understanding of the article is, and the stronger the reading ability will be. Guided by schema theory, this paper will explore and analyse college English reading teaching and learning.

1) *Enhanced language schema:* Language schema refers to the degree of mastery of language knowledge that the reader mastered. The first step in reading comprehension is to identify words and establish the representation of lexical meaning. Vocabulary, idiom, sentence structure and grammatical knowledge in discourse are linguistic schemas. When a reader knows the meaning and usage of a word, it searches for the language schema that can explain the input information in the information stored in his brain. When these schemas are found, the reader will have an understanding, otherwise there will be obstacles to reading. Vocabulary and grammar constitute the basis of the article. Only when students master certain basic knowledge can they read the articles and study the articles. Therefore, in teaching, schema theory can be used to guide learning words and enhance language schemas. Some key words are selected to enlighten students to use context, activate relevant language, and allow students to memorize words on the basis of understanding of new words and increase the sense of familiarity. Use the same word root, the same word, or synonym, antonym and apposition to guess the meaning of the word, use the association method to store the new word as the long-term memory. Students should be encouraged to use schemata to help understand and increase input and output in reading teaching.

2) *Optimized content schema:* Content schema refers to a series of background knowledge related to reading materials related to politics, economy, culture, religion, geography and history. To some extent, content schema plays a greater role than language schema. If the students lack the corresponding contents, they cannot integrate and analyse the information of the language schema and form schema related to the mind in the reading process, and the understanding of the article cannot be completed. In the course of text reading teaching, teachers should combine the teaching content with the background knowledge as much as possible, infiltrate the cultural background knowledge in the classroom teaching, make full use of the existing knowledge structure of the students, pay more attention to the cultivation of the intercultural communication ability, optimize the students' content map, and guide the students from the overall context of the article. On the basis of deep understanding, we try to help students build and form new content schemata, try to cultivate students' structure analysis and generalization ability and comprehensive ability, so as to improve the quality of teaching and students' reading comprehension.

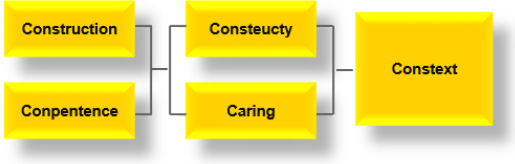


Figure 6.The process of constext

3) *Curing form:* The formal schema refers to the reader's knowledge of the logical structure and rhetoric of the article, and is the study of the type, structure, subject matter and layout of the reading material. The diversity of genres and structures will

also influence reading comprehension. Therefore, the control of the genre and structure of the article can help readers quickly extract the most important information and achieve the understanding of the content of the article. In the teaching of text reading, teachers should analyse the characteristics and structure of different genre articles. Through direct teaching, they can help students to build form schemata directly and efficiently, solidify form schemata, help students understand the meaning of the materials read quickly, guide students to integrate and improve the efficiency of reading, and thus promote the efficiency of reading. The enhancement of dynamic reading ability (Sherman & Morley, 2015).

Reading comprehension is a cognitive process and a series of proactive thinking activities. In the process of reading, only by combining language form with background cognition can readers achieve the goal of correct understanding. The more schemas in the reader's brain, the more accurate and thorough the understanding of the article is, and the stronger the reading ability will be. Therefore, in the teaching of College English text reading, teachers help students build, enrich, improve and activate the students' schema by expanding their language knowledge, infiltrating cultural background knowledge, explaining the structure of the text and analysing reading skills, so as to improve the efficiency of reading comprehension.

4) *Rich schemata:* Through the above analysis, it is known that every student can understand the article by his own existing schema when reading the material. If the student's language schema, content schema or form schema is missing, students will have more problems in reading comprehension, especially for non-English Majors in Colleges and universities. The language schema may not be as rich as the English majors, and there are many deficiencies in the other aspects of the schema. Therefore, the schema construction of non-English majors is particularly important. In the course of reading teaching, teachers should pay attention to expanding the students' vision. They need to introduce the background of the reading content in advance, enrich the schema related to the students' mind, and relieve the certain cultural barriers for the students, which is the most important step to improve the students' reading effect.

5) *Activation schema:* Students need to activate their schemata first in reading. At this time, two aspects of text information space and schematic information space need to be involved. When some text or information that appears when reading materials can stimulate a certain schema in the mind of the student's mind, the student will choose the schema that is beneficial to the reading of the article from its own knowledge system. Therefore, in the teaching of English reading, teachers should also be good at activating students' schemas and cultivating students' divergent thinking.

6) *Construction of schema:* English reading is actually a process of building a student's schema of knowledge. In English teaching, the teacher can help the students to build the schema from the following ways, [U70. Before reading the article, teachers need to introduce the necessary cultural background to the students and eliminate cultural barriers, such as video, pictures, books and newspapers, and so on. Organize students to participate in a variety of forms of cultural knowledge lectures, by introducing the history, geography and customs of a certain country and regions, enriching the students' cultural knowledge and helping students understand the cultural differences in different countries. For example, some theatrical performances, English speeches, knowledge quiz and other activities. Enrich the students' vocabulary knowledge. Lexical knowledge

Learning is the basis of English reading, and it is also a way for students to understand the culture of different countries. In addition to the teaching of lexical meaning, vocabulary teaching should also include structural meaning and register meaning. Different words also contain different backgrounds and contexts. Teachers should also attach importance to imparting students.

7) *Application schema:* The establishment of schema is to make better use of schema to solve problems in learning. After reading teaching, teachers should also set up different situations for students to apply them flexibly, such as discussion, post addition, role playing, evaluation and so on. Through various forms of teaching activities, students can not only deepen their understanding of knowledge, but also enrich their cultural knowledge and improve their language expression ability.

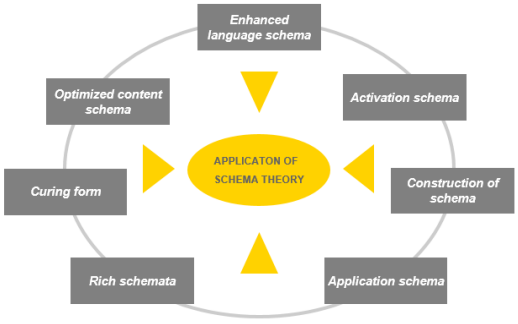


Figure 7.Applicationofschematheory

5. CONCLUSION

Reading, as the fastest and most direct way to absorb knowledge, has always been the key training skill of university teachers. It is hoped that teachers can make clear the essence of reading, make full use of schema theory, change the mode of students' reading from passive acceptance of knowledge output into the mode of actively absorbing knowledge and information and making it internalized quickly, and continue to make efforts in the exploration of English

reading teaching methods and raise the level of reading teaching.

AKNOWLEDGMENT

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Research on the Application of New Media in Brand Marketing of FMCG

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Abstract: The appearance of new media marketing mode has a profound impact on the development of enterprise marketing activities and brand building. This paper analyses the application of new media in brand marketing of fast consumer goods, expounds the basic connotation, characteristics, forms of expression of new media marketing, and how to make good use of new media in enterprise marketing. At the same time, this paper combs the relevant theories and practical methods of new media and new media marketing properly, and puts forward perfect suggestions and feasible measures and programs based on the actual situation and development status, so as to actively enrich the relevant theories of media marketing in the new era.
Keywords: FMCG; Marketing

1. INTRODUCTION

Fast moving consumer goods (FMCG) is a kind of impulse purchase consumption, which has short cycle, fast consumption, short life span and large one-time investment. In the new media era, the marketing of FMCG is facing new opportunities and challenges. The main characteristics of new media are interaction and individualization, which are closely related to people's modernization needs. Various new media provide a variety of channels for communication with consumers. Fast moving consumer goods can make full use of new media in marketing, strengthen communication with consumers, meet consumers' needs and improve consumers' stickiness.

In brand marketing, fast moving consumer goods should adapt to the changes of the new media era, integrate resources, make scientific use of various new marketing platforms, break the restrictions of traditional marketing, meet the needs of brand marketing, and strengthen the relationship between consumers and sellers. Build a good brand image, attract more consumers, promote brand communication and product sales [1-7].

2. THE RESEARCH STATUS OF NEW MEDIA IN MARKETING AT HOME AND ABROAD

Miller R and Lammas N. point out in their work Social Media and its implications for viral marketing that social media is a powerful medium available to marketers. For marketers, they can actively use micro-blog to find and attract consumers, and gradually establish a stable customer group.

Chen Siyu (2015) put forward in his research that Wechat marketing has impacted the traditional marketing methods, and is also an innovation of the traditional marketing methods, which occupies an important position in modern marketing. Deng Qiaoxi, Wang Pi and Zhou Zhimin (2015) put forward that in the social era, the era of online media, business and customers, business and business, not employment relationship, but a kind of social friend relationship, in which everyone can express their views and views in the community. Dai Rong (2014) proposed in brand marketing in the new media era that we should follow the principles of precision marketing, innovative marketing, perceptual marketing and personalized brand marketing, accurately locate consumers, pay attention to word-of-mouth marketing, satisfy consumers' spiritual pursuit through emotional micro-blog marketing, and quickly spread through event marketing. We should adopt wireless marketing methods to keep pace with the times and pay attention to mobile internet marketing.

Sun Yi (2017) in the brand marketing communication strategy, that the brand lacks the power to establish an independent brand, the lack of adequate resources to support, managers lack of attention to brand marketing, to flexibly adjust marketing strategies, skilled in new media, brand building and publicity [8-15].

3. THE CONNOTATION, CHARACTERISTICS AND FORMS OF NEW MEDIA MARKETING.

(1) The connotation of new media

New media refers to the general term of some new media types based on the Internet. People's daily life is inseparable from the new media, such as people's commonly used micro-blog, micro-mail, blog and so on, which has become an important social tool. In the application of these new media, people can use the network, combined with their actual situation and needs for selective application, using different new media for information dissemination and exchange. For different enterprises, they can also choose appropriate new media to apply according to their actual needs of operation and development, in order to achieve the purpose of brand promotion or marketing.

(2) The characteristics of new media

1) The speed of communication is fast

With the development of network technology, various new media are emerging. New media is closely related to information technology and is spreading

faster than traditional media. With the continuous emergence of various mobile terminal devices, people can learn the latest information through various new media anytime and anywhere, and realize online information, video browsing and query.

2) Two-way communication

New media also has the characteristics of two-way communication. In the past, most of the media are one-way communication mode, but the new media put the audience in the main position. Therefore, for the general audience, not only can actively consume various information products, but also can freely release various information publishers. For example, people can freely publish pictures or text by using the popular microblog.

3) Strong interaction

New media has strong interaction, relying on information technology, new media types are rich and diverse, such as Weixin, Weibo, community, forum, etc., are commonly used tools. Using the different types of new media mentioned above, people can carry out various kinds of information exchange and interaction according to their interests, hobbies and needs. Therefore, different netizens can communicate with brands and other consumers in different ways, express their opinions, and receive various consultation from different netizens or brands, which fully reflects the good interactive characteristics of new media.

(3) Manifestation of new media

New media are of diverse types, with many distinctive characteristics and diverse forms of expression. As far as the development and application of new media are concerned, different forms of new media, such as micro-blog, blog, forum and micro-message, have been widely used. New media has many different forms, specifically, including online encyclopedia and various social networking sites.

4. THE MANAGEMENT STRATEGY OF BRAND NEW MEDIA MARKETING FOR FAST MOVING PRODUCTS

(1) Products

The product homogeneity of fast moving consumer goods is relatively high, and it is a comprehensive market competition. If we want to obtain the market, we need to constantly innovate products with unique selling points. Therefore, fast-moving consumer goods in the market are constantly emerging new concepts and product forms. Fundamentally speaking, marketing is the competition between products and consumer experience. Improving the product strength of enterprises is not necessarily a subversive innovation. Even small changes may help products to open up more market space and find new markets. Enterprises need to pay more attention to the needs of consumers, meet the experience of consumers, and create a new market through change.

(2) Pricing

Reasonable price can not only bring profits to enterprises, but also make consumers accept it. They are willing to buy products and promote the spread of brands. Fast moving consumer goods enterprises should establish a scientific product price system to ensure the transparency of prices. The market competition of fast consumables is very fierce, and the price of fast consumables should not exceed that of similar products. It should be mainly within the acceptable range of consumers. Fast consumables need to raise their prices after upgrading. It is easy for consumers to have a feeling of disguised price increase. Therefore, while marketing, it is not recommended to increase prices, but to increase the sales of products. If there is a cost increase, we must also control the extent of price increase. When introducing new products, if the product positioning is relatively high, the price can be set higher than the price of existing products of the same kind, but it should not be too high, affecting consumers' purchase.

(3) Channels

Channels are very important in product marketing. Fast moving consumer goods (FMCG) have the characteristics of fast consumption and short turnover period. Consumers usually need to repeat their purchases and sell large quantities. In the homogeneous product environment, if FMCG enterprises can grasp more channels and have higher channel control, they will easily get market voice and achieve the ultimate goal of marketing. Fast moving consumer goods have a strong dependence on channels. Channels are related to the survival and development of fast moving consumer goods. They are in a weak position in negotiations with channel merchants. Channel costs affect the cost of fast moving consumer goods and their subsequent development. Especially for brand of new enterprises, high channel costs may directly affect them. The development of brand market. If the enterprise cannot bear the cost of the channel, it is easy to be limited in the development. Mature brands will get the best marketing methods through the combination of channel strategies, so as to reduce channel costs and improve profit margins.

(4) Public relations

In brand marketing, we should maintain good public relations, pay attention to communication with consumers, and create a good social and humanistic environment. With the development of economy and the improvement of material level, people's education level is getting higher and higher, and their spiritual needs are becoming more diversified. More and more consumers pay attention to spiritual products and choose brands that conform to their own values. In marketing, fast moving consumer goods need to pay attention to the spiritual and cultural needs of consumers, convey brand values, establish a good image and attract consumers' attention. Consumers

pay attention not only to the products themselves, but also to the experience of products and brands, which is consistent with their identity and temperament.

5. RESEARCH CONCLUSIONS

At present, to some extent, all kinds of new media are not only an application platform, but also an ecological operation platform and social pipeline connecting users and businesses. New media has opened up new ways for brand marketing. Enterprises are increasingly aware of the role of new media marketing. They begin to attach importance to the use of new media platform, establish a good corporate image, carry out brand publicity, strengthen ties with consumers, and expand brand influence. The big data formed in the new media also serves the enterprises. Through the analysis and refinement of the data, it can provide reference for the enterprises to develop new products, improve marketing and service strategies, and promote the continuous improvement of enterprises. New media is more sophisticated than other social tools and has the advantage of first-mover. It plays an important role in brand marketing of fast-food enterprises.

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Analysis of the Cost and System Effect of Domestic Waste Disposal

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Abstract: According to the investigation, there are four kinds of waste disposal methods in China: comprehensive treatment, incineration treatment, landfill treatment and composting treatment. By constructing a weighting model, the total waste disposal cost is obtained, and the value of the different specific gravity is about 550 yuan. The effect of the four types of treatment is different. The analysis shows that the effect of incineration is mainly environmental pollution, landfill is mainly due to poor processing capacity, the compost is overinvestment in the early stage, but the comprehensive treatment mainly combines the advantages of the above three kinds and the treatment effect is remarkable. In the formulation of an enforceable policy, it is necessary to consider it. Therefore, two simulation models are selected to replace the local parts. In North China, represented by Beijing, incineration is usually used; in East China, represented by Changzhou, incineration is the main treatment method, and landfill is the supplementary treatment method. The garbage classification charge refers to different garbage collection fees, which have certain rewards and punishments. By comparing and analyzing the data at home and abroad, it was found that after the implementation of this policy in the pilot cities, the garbage production has a significant downward trend. It was found that the garbage classification and charging system can reduce the amount of garbage generated to a certain extent.

Keywords: Domestic waste treatment; Weighting method; Simulation model

1. INTRODUCTION

With the improvement of people's living standards, more and more garbage is generated in life, and more and more problems are brought about, such as environmental pollution, endangering human health, and excessive depletion of social resources. Therefore, through data collection, processing, and analysis, we will establish optimal solutions such as weighted models, multivariate linear regression models, and equilibrium models to find the best solutions for the treatment of domestic waste, formulate more complete systems, and reduce resource consumption. Reduce environmental pollution

2. TOTAL COST ANALYSIS

(1) Analysis of guidance map

The total cost of garbage disposal includes the cost of technical cost and fixed cost. The common ways of garbage disposal are divided into four ways: comprehensive treatment, incineration treatment, landfill treatment, and biological treatment. By looking up the relevant information [1-3] to find specific data, the cost analysis map of the domestic garbage disposal shown in Figure 1.

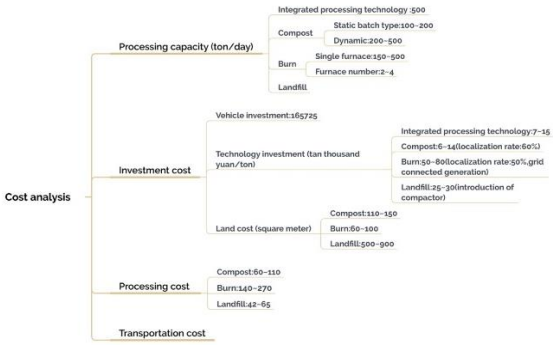

Figure 1. Cost analysis map of domestic waste disposal

(2) Establish a model

According to the investigation, the treatment methods of garbage are mainly divided into four categories: comprehensive treatment method, incineration treatment method, landfill treatment method and compost treatment method, and different treatment methods have different cost components. China's garbage disposal is mainly composed of these four treatment methods. Therefore, by constructing a weighting model, the total garbage disposal cost is obtained. Finding the optimal treatment by weight comparison minimizes cost.

There is a certain quantitative relationship between the unit waste treatment cost and the technical cost, fixed cost and total waste. The relationship is obtained by consulting the relevant data [2]:

$$\textbf{unit}\ proces\sin g = \frac{Technical\ \cos t + Fixed\ \cos t}{Total\ \ amount}$$

Processing technology costs are calculated using the weighted sum method, Because there are four kinds of garbage disposal methods, and the proportion of different garbage disposal methods in real life is different, we assume that the proportion of comprehensive treatment is x_1, the proportion of compost treatment is x_2, the proportion of incineration treatment is x_3, and the proportion of landfill treatment is x_4. The sum of proportions must be 1. That is:

$$\sum_{i=1}^{4} x_i = 1 \tag{1}$$

Since the capacity per unit time of each garbage treatment plant is limited, we assume that the comprehensive capacity of a garbage treatment plant is a (unit construction).

$$x_1 * Total\ amount \le 500a$$

Because the composting treatment is divided into static intermittent and dynamic processing, it is assumed that the static intermittent composting treatment and dynamic composting treatment of the plant are $b_1 b_2$, that is:

$$x_2 \le Total\ amount \le 200b_1 + 500_2$$

The incineration treatment needs to be carried out in the incineration equipment. Because of its large footprint, and more pollutants will be produced during the incineration process, the number of the equipment will be limited in a certain area. If the incineration equipment of a garbage treatment plant is c, according to the data, we can obtain:

$$x_3 * Total\ amount \le 500c\ \ (2 \le c \le 4)$$

(3) Fixed cost of garbage

The fixed cost of garbage consists of land cost and construction cost. Land cost: Because China's land belongs to the state, its land cost should be based on the opportunity cost method. The land price assessed by the waste treatment plant is multiplied by the landfill of the waste treatment plant as the land price. Use the equal-rate sequence to pay the present value method as the rental price for the annual land.

Construction cost: According to the construction cost actually paid by the government, we use the direct cost method to obtain the cost of the waste treatment plant. It is then apportioned to the straight-line method of the annual cost adoption method, if the annual depreciation amount is equal during the economic life of buildings and equipment. Among them, the annual construction cost, the construction subsidy provided to the government, and the franchise period of the waste treatment plant and fixed as W.

$$W = US * \frac{\boldsymbol{i}(1+i)^n}{(1+i)^n - 1} + \frac{b}{e} \tag{2}$$

Several treatment methods are brought into the solution obtained with different specific gravity, and the value is about 550 yuan.

3. ANALYZE THE EFFECT OF DIFFERENT WAYS OF DOMESTIS GARBAGE AND GIVE COUNTERMEASURES

3.1 Different ways to deal with domestic garbage

3.1.1 Incineration

Incineration is the high temperature heat treatment of garbage. The combustible components in the waste will react violently with oxygen in the incinerator (800°C~1000°C), Convert waste into high temperature flue gas or solid slag and release a lot of heat. The volume of garbage after incineration can be reduced by 80% to 90%. Some harmful organic substances can be detoxified by incineration, and the related heat reaction can be used for power generation or heating [4, 5]. The slag can be made into building bricks. Therefore, incineration treatment is also the most effective means to realize the recycling, reduction and harmless treatment of domestic garbage. In the actual operation of the country, only the use of foreign technology and equipment, but not fully consider the local actual situation, so the treatment effect is not satisfactory. Incineration treatment is mainly applied to garbage with low calorific value, low water content and less gray matter. If the gray matter is too much, it will pollute the atmosphere. Most domestic garbage produced in most cities do not meet the above conditions, and the collection and storage methods are mixed, which is not conducive to efficient operation of waste incineration plants.

3.1.2 compost

Composting is the process of degrading and destroying domestic garbage by using some saprophytic organisms. Aerobic composting is used in domestic waste composting. The composting treatment has the advantages of large waste reduction, complete decomposition of materials, low risk, high efficiency, easy promotion, and high universality, but it has higher technical requirements and a larger investment in the early stage.

3.1.3 Landfill

Landfill is a kind of garbage disposal method widely used in large, medium and small cities today. However, due to its simple equipment, it is easy to use landfill. It has many hidden dangers, which will not only cause secondary pollution to the environment, but also human health. There is a certain threat. At the current stage, landfills are often equipped with higher protection measures. For example: strict anti-seepage facilities and exhaust gas drainage devices to minimize environmental pollution. The advantage of landfill treatment is that the garbage consumption is large, the applicability is wide, the operation management is simple, and the operation cost is low. The disadvantage is that the floor space is large and the degradation time is long.

3.1.4 Comprehensive treatment

Due to the increasing diversification of domestic waste types, the drawbacks of using a certain disposal method to treat garbage have become increasingly prominent. Therefore, the first three treatment methods are combined to make up for the shortcomings and overcome various deficiencies as much as possible to make the advantages more significant. The comprehensive treatment can freely combine the garbage disposal methods according to the actual conditions of each region and the different garbage components, and give full play to the advantages of the above three kinds of garbage disposal methods, and adopt the most suitable garbage disposal scheme.

Integrated several processing methods, analyzing and comparing their advantages and disadvantages, it is easy to see that the incineration treatment has too much impact on the environment, the cost of composting treatment is too high, and the landfill treatment area is the largest, while the comprehensive treatment is within a certain range, which is greatly reduced. Its negative impact, so the comprehensive treatment is more appropriate.

To consider the four key factors of each mode when dealing with garbage: input ratio, processing intensity, degree of front-end classification and pollution degree to the environment. Then we can construct a multiple linear regression model

3.2 Domestic garbage disposal measures

Drawing on relevant data from Beijing and Changzhou, build a simulation model:

As the political center of China, Beijing has a large population density. Therefore, when considering the treatment method, we should pay attention to the total amount of pollution generated by the treatment method and the degree of harm to the human body. Because Beijing garbage treatment plants are mostly old-style processing equipment, many the incineration method is adopted, but its pollution to the environment is too serious, and the financial investment in the governance environment is high, which greatly causes waste of resources.

Changzhou is a second-tier city in Jiangsu Province, but its per capita GDP is high, its population density is average, and its garbage site is selected as a suburb. When considering its treatment, its treatment will greatly reduce the harm to the human body, and its damage will be greatly reduced. Large footprint. In combination with the actual situation in the local area, the treatment method of the garbage dump is mainly based on incineration treatment, and the landfill treatment is supplemented.

Combined with the above two simulation models, waste treatment plants in different regions should formulate appropriate treatment systems according to local conditions.

We collected the garbage disposal methods of the provinces in 2012. The density of population in developed inland areas of China is more than 341 people/km2, which is much higher than that of developed countries such as Japan. It is urgent to increase the proportion of waste incineration, which needs to increase by 40.89~85.17%. In the more developed areas of central China, the population density is 229~341 people/km2. Some provinces and municipalities urgently need to increase the application of waste incineration. For example, Hunan and Jiangxi rely heavily on landfills and need to increase the application of waste incineration. In less developed areas such as the west, the population density is less than 229 people/km2. There is little demand for the application of waste incineration technology in these areas. Provinces and municipalities with conditions can carry out the application of waste incineration in a small amount. The recycling of garbage and the reduction of waste generation at the source are the most fundamental methods to solve urban domestic waste. Therefore, China must gradually increase the application of garbage collection and reducing the amount of garbage generated at the source.

4. WHETHER THE WASTE DISPOSAL CLASSIFICATION AND CHARGING SYSTEM IS USEFUL

4.1 Research status abroad

According to foreign scholars' analysis of the United States of Virginia University City of waste metering user fees, the results show that 75 residents of the total amount of garbage generated by the average reduction of about 14%, the total volume decreased by about 37%, the total amount of recycled garbage increased by about 16%. Another scholar analyzed how and to what extent the waste charge and waste classification policy affects the effectiveness of municipal solid waste management, and concludes that these policies can reduce the per capita waste production in a certain sense. In foreign countries, the Waste classification treatment under the charging system has been widely used, which has become a new trend of household waste charging. In Germany, the United States, Japan and other countries have implemented the domestic waste classification and waste metering user fees system. A community in Iowa, USA, has been implementing the waste metering user fee system since 2002, and the effect of waste reduction has been significant. The community's average monthly garbage collection increased by 30% and the amount of garbage processed decreased by 28% since the start of the waste metering user charge. According to the 1998 statistics of the European Society for Recycling and Recycling (ERRA), the Hainaut of Belgium implemented a 65% reduction in the amount of landfill waste for the first year, while the Netherlands province of North Holland has reduced its production by 38% and landfill waste by 60%, and in Japan, 13% of incineration and 27% of none incineration were reduced.

These countries in the implementation of household waste metering user charging system has played a waste reduction, the effect of resources, it is worth our reference.

4.2 Domestic research status

In China, Guangzhou has done a better job in the garbage classification and charging system. Guangzhou 2013, the garbage metering user charge pilot scheme, the use of garbage charges with the bag levy and the real name of the garbage bag. In the pilot community, each household will receive 2 free special garbage bags a day, one is other garbage bags, and one is a kitchen waste bag. If the amount of garbage generated by the residents is larger and the free garbage bags are not enough, the residents must buy a special garbage bag separately. The price is set at 1 Yuan. After the implementation of the real-name garbage bags, if there is a substandard classification phenomenon, residents will be warned or punished. According to statistics, the garbage metering charge pilot, Guangzhou Haizhu District South China Corner Road Whole Street Nissan Total daily garbage reduction to 17.38 tons per month, the daily life of household waste emissions to 1.7 kilograms, the total amount of domestic waste compared to the pilot reduction of about 21%. It is learned that in a reasonable system can reduce the quantity of rubbish.

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Variation Characteristics of Tree Layer in Typical Subtropical Forest Communities

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Abstract: The characteristics of forest community change are mainly reflected by species diversity and important values. Based on the survey data of plants in the mi subtropical arbor layer, the changes of species diversity in five years are analyzed, and the influencing factors of species diversity are discussed. The results showed that: The dominant tree species in thetree layer of Tiantong Station was Cystinosis and Camelliafraterna. There were 47 species richness of forest communities in Tiantong Station in 2007, including 9 species of deciduous trees, 3 species of deciduous trees disappeared in 2012, and 13 species of new evergreen trees. The evergreen forest has greater viability than the deciduous forest. The simpson index, Shannonwiener index and pielou index of the arbor layer plant community in Tiantong Station increased in 2012 compared with 2007, so the species diversity in 2012 is higher than that in 2007.
Keywords: community structure change; species diversity; important value

1. INTRODUCTION

Biomes, as a collection of different populations living in the same environment within a certain geographical area, have extremely complex interrelationships [1]. However, different plant communities have great differences in structure and function, and this difference is mainly reflected in species diversity. Species diversity is a comprehensive reflection of species richness and its distribution uniformity, which can reflect the differences in composition, structure and function of biomes [2-4]. Therefore, the structural characteristics of plant communities are mainly reflected by the species diversity characteristics of the communities.

In forest ecosystems, the arbor layer is the dominant layer in the forest community and plays a role in building populations [5-8]. Its spatial distribution largely determines the spatial heterogeneity of forest community structure characteristics. Therefore, studying the forest community structure by forest species diversity characteristics can reflect the structure of forest community most intuitively. And the ecological process is an important part of understanding the changes in forest community structure [9].

The mid-subtropical forest preserves relatively intact evergreen broad-leaved forests, and the tree species in the arbor layer are rich in species, concentrated in specific components, rich in intraspecific variation, and complex in community structure. Therefore, the typical mid-subtropical forest community selected in this paper has a high research value.

2. STUDY ON THE FOREST COMMUNITY STRUCTURE BASED ON SPECIES DEVERSITY

2.1 IMPORTANT VALUE CALCULATION

Important values are important indicators for calculating and assessing species diversity, and comprehensive values are used to reflect the relative importance of plant species in the community.

For arbor: important value = (Relative density + Relative frequency + Relative significance)/3

among them, Relative Frequency =(Frequency of the species / Sum of all kinds of frequencies) × 100%

Relative significance = (The chest area of the individual in the sample / The total chest area of all individuals in the sample) × 100%

Relative density = (Density of a certain plant / Total density of all plants) × 100%

2.2 SPECIES DIWERSITY ANALYSIS METHOD

Community species diversity analysis selected four indicators: species richness, $simpson$ index, $shannon-wiener$ index and $pielou$ index to evaluate diversity.

(1) Species richness is the number of species in the measured sample.

(2) $simpson$ index calculation formula:

$$D = 1 - \sum p_i^2 \tag{1}$$

Among them, p_i is an important value of the i-th species in the community.

(3) $shannon-wiener$ index calculation formula:

$$H' = -\sum \frac{p_i}{\ln p_i} \tag{2}$$

(4) $pielou$ index calculation formula:

$$E = \frac{H'}{\ln S} \tag{3}$$

3. IMPACT OF IMPORTANT VALUES AND

SPECIES DIVERSITY ON COMMUNITY STRUCTURE

3.1 IMPORTANT VALUE ANALYSIS

Important values are important indicators in the calculation and assessment of species diversity, with comprehensive values indicating the relative importance of plant species in the community. The important value changes of each tree species were obtained by calculating the relative density, relative frequency and relative saliency. Research on tree species with important values in 2007 and 2012, as shown in Table 1:

Table 1 2007 and 2012 tree species important value change table

Plant species name	number		Relative density %		Relative frequency %		Relative significance %		average value IV %	
	2007	2012	2007	2012	2007	2012	2007	2012	2007	2012
Castanopsis	84	94	13.6808	12.5668	3.3600	3.7600	69.3109	67.8706	28.7839	28.0658
Camellia fraterna	145	177	23.6156	23.6631	5.8000	7.0800	0.0390	1.3973	9.8182	10.7135
Neolitsea aurata Koidz. var. chekiangensis	37	57	6.0261	7.6203	1.4800	1.2632	0.0164	1.2632	2.5075	3.7212
Eurya rubiginosa var. attenuata	36	36	5.8632	4.8128	1.4400	0.2244	0.0552	0.2244	2.4528	2.1591
Eurya loquaiana Dunn	34	60	5.5375	8.0214	1.3600	2.4000	0.0749	0.8327	2.3241	3.7514
Daphniphyllum	25	0	4.0717	0.0000	1.0000	0.0000	0.0992	0.0000	1.7236	0.0000
Schima superba Gardn. et Champ	19	22	3.0945	2.9412	0.7600	0.8800	1.1376	15.6935	1.6640	6.5049
Elacocarpaceae	23	29	3.7459	3.8770	0.9200	1.1600	0.0139	0.6582	1.5600	1.8984
Daphniphyllum	0	28	0.0000	3.7433	0.0000	1.1200	0.0000	1.3245	0.0000	2.0626
Symplocos sumuntia Buch	19	33	3.0945	4.4118	0.7600	1.3200	0.0010	0.2497	1.2851	1.9938
Helicia cochinchinensis	17	0	2.7687	0.0000	0.6800	0.0000	0.0270	0.0000	1.1586	0.0000
Red leaf tree	0	19	0.0000	2.5401	0.0000	0.7600	0.0000	0.1763	0.0000	1.1588

As we can be seen from Table 1, the important value of the cross-breeding wood and Helicia cochinchine is gradually reduced to 0, while the important value of the tiger-skin and red-leaf tree is gradually increased from 0. Therefore, it can be considered that the cross-breeding wood and the small fruit longan are dead trees, and the tiger-skin, red leaves. The tree is a new species. Within five years, the important values of Castanopsis and Camellia fraterna are relatively stable and far higher than other tree species. It can be concluded that the dominant tree species in the arbor layer of Tiantong Station are Castanopsis and Camellia fraterna.

3.2 BREAST DIAMETER ANALYSIS

The size of the DBH of the tree reflects the important value of the tree species to some extent. The average breast diameter calculated from the dominant tree species in the arbor layer in 2007 and 2012 is as follows, as shown in Table 2.

Table 2 Comparison of average breast diameter of tree species in 2007 and 2012

Years	Average breast diameter (cm)
2007	7.425
2012	6.030

It can be seen from the above table that the average DBH reduction of the dominant tree species in the arbor layer in 2012 is lower than that in 2007. It is indicated that the survival rate of most tree diameters with smaller DBHs in the community succession during the five years is higher than that of the trees with larger DBH. Therefore, it can be considered that the small DBH species have advantages.

In 2007 and 2012, the total number of plants in the sample area was selected from the arbor layer, as shown in Table 3:

Table 3 Comparison of total trees in 2007 and 2012

Years	Total(Tree)
2007	614
2012	748

It can be seen from the above table that the total number of trees in the arbor layer increased by 134 in 2012. It indicates that the species richness of mid-subtropical forest communities has a significant upward trend in five years.

The average value of the DBH was calculated from the tree species with an important value of not less than 1% and analyzed as follows, as shown in Table 4:

Table 4 Comparison of average breast diameters of tree species with important values greater than 1% in 2007 and 2012

species	Average breast diameter of tree species in 2007 (cm)	species	Average breast diameter of tree species in 2012 (cm)
Castanopsis	26.76	Castanopsis	22.41

Thin leaf hawthorn	2.29	Thin leaf hawthorn	3.06
Drug barrier	1.93	Sassafras tzumu	37.08
Camellia fraterna	2.05	Camellia fraterna	2.6
Mouse vector	2.28	Red leaf tree	2.83
Schima superba Gardn. et Champ	25.35	Schima superba Gardn. et Champ	23.7
Symplocos sumuntia Buch	2.02	Symplocos sumuntia Buch	2.5
Elacocarpaceae	2.5	Elacocarpaceae	4.1
Eurya loquaiana Dunn	2.38	Eurya loquaiana Dunn	3.19
Eurya rubiginosa var. attenuata	1.6	Eurya rubiginosa var. attenuata	2.27
Neolitsea aurata Koidz. var. chekiangensis	3.46	Neolitsea aurata Koidz. var. chekiangensis	4.2
Daphniphyllum	3.46	Daphniphyllum	5.29
Helicia cochinchinensis	1.9		

According to the comprehensive table 2-4, there are 13 species with an important value greater than 1% in 2007. In 2012, there were 12 species with an important value greater than 1%. Among them, the 2007 rat, the cross, the small, the longan, and the small the important value of medicines in 2012 was less than 1%, and the important value of Hongyeshu, Hupinan and Zhangmu increased in 2012 compared with 2007. For the growth trend of the average DBH of the tree species, the average DBH of the average species with a DBH of less than 20, such as the thin leaf hawthorn, the herbicide, the Camellia fraterna, and the mouse, and the average DBH of the average DBH greater than 20 in 2012. Less than in 2007. In line with the above conclusions.

3.3 species diversity analysis

By calculating the species richness of the arbor layer communities in 2007 and 2012, *simpson* index, *shannon − wiener* index, *pielou* index, the results are as follows, as shown in Table 5:

Table 5. Comparison of various indicators of tree species in 2007 and 2012

	2007	2012
Species richness	47	46
simpson	0.8976	0.8996
Shannon wiener	2.0857	2.1208
pielou	0.5417	0.5539

As can be seen from the above table, the species richness in 2012 was one less than that in 2007, but the index, index and index in 2012 increased compared with 2007, so it can be considered that the species diversity in 2012 increased compared with 2007.

The species richness of the two forests in the typical sub-tropical forest arbor layer in 2007 and 2012 was available. There were 14 species of trees that died in 2012, three of which were deciduous trees, namely Leigong hornbeam and wood wax tree. And Cystinosis, accounting for 33.3% of the total number of deciduous trees. In 2012, there were 13 species of trees grown in 2007, all of which were evergreen species, of which the number of red-leaved trees and tiger sylvestris increased. Therefore, it can be concluded that the survival ability of evergreen trees is higher than that of deciduous trees.

4. CONCLUSION

According to the analysis of the important values of the arbor layer in the typical forests of Central Asia, the dominant species in the arbor layer of Tiantong Station are Castanopsis and Camellia fraterna. The different species can be used to measure the species diversity of Tiantong Station. For the five-year period, the index, index and index of the arbor layer plant community in Tiantong Station showed an increasing trend, indicating that the species diversity of the arbor layer community in Tiantong Station increased. The tree species in the study showed that all the new tree species were evergreen trees, about 33.3%. The deciduous tree species are dead tree species, and the evergreen forest has higher viability than the deciduous forest.

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Analysis of Air Pollution in Beijing, Tianjin and Hebei

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Abstract: Taking Beijing, Tianjin and Hebei as the research object, explore the air pollution problem. Firstly, the weight of pollution items is calculated by AHP, and a mathematical model is established to measure the degree of air quality pollution. Secondly, the dynamic weighting method is used to deal with the data, and the comprehensive ranking is carried out. The range of pollutant concentration and the standard of air quality are obtained. Then, by using the optimized Gao Si model, the concentration of air pollutants in a certain range and time is calculated, and the air quality grade is evaluated. The relationship between the data and the pollution sources is analyzed by using the inversion method of measured data. Five representative pollutants are selected, and the pollution types of the discharged pollutants are put forward. The main factors and proportion of pollutant emission are obtained respectively. Finally, the key parameters affecting air quality are analyzed through the establishment of model and the collection of data.
Keywords: Analytic hierarchy process; Dynamic weighting; Optimized Gao Si tobacco plume model

1. INTRODUCTION

Economic transformation, energy conservation and emission reduction, development of new energy and other issues need to be resolved. Put forward the 19th congress, construction of ecological civilization is the sustainable development of the Chinese nation in one thousand, adhere to the harmonious coexistence between man and nature as the new times adhere to and develop socialism with Chinese characteristics the important content of the basic strategy of the construction of beautiful China as the major target of all-round construction of socialism modernization power in Beijing-Tianjin-Hebei region as the research object to establish mathematical model to explore the influencing factors on the quality of the air [1-5].

2. AHP DETERMINES AIR QUALITY

Firstly, in order to make full use of the obtained data and roughly determine the influence degree of each pollution project on air quality, the analytic hierarchy process (ahp) is used to establish the correlation model between major pollutants [6, 7]. Then, the levels of different pollution components were divided, and the weights of each index were established by AHP, and the paired comparison matrix was constructed:

$$A=\begin{Bmatrix} 1 & 5 & 3/5 & 5 & 5/7 & 5/7 \\ 1/5 & 1 & 3/1 & 1 & 1/7 & 1/7 \\ 3/5 & 3 & 1 & 3 & 3/7 & 3/7 \\ 1/5 & 1 & 1/3 & 1 & 1/7 & 1/7 \\ 7/5 & 7 & 7/3 & 7 & 1 & 1 \\ 7/5 & 7 & 7/3 & 7 & 1 & 1 \end{Bmatrix}$$

Secondly, feature root can be obtained through paired comparison matrix λ. In order to judge whether the inconsistency of matrix is within the allowable range, its consistency needs to be tested:

$$CI=\frac{\lambda_{\max}-n}{n-1} \tag{1}$$

And calculate the consistency ratio of judgment matrix:

$$CR=\frac{CI}{RI}=0<0.1 \tag{2}$$

That matrix A passes the consistency test.

Then, AHP method was used to establish the weight of various pollutant components, as shown in the following table: the weight of influencing air quality factors and the test value, as shown in Table 1:

Table 1 Weight and test value

$PM_{2.5}$	CI	CR		$\lambda_{\max}$
0.292	0	0		6
SO_2	CO	NO_2	O_3	PM_{10}
0.208	0.042	0.125	0.042	0.292

Finally, we need to multiply the air quality index of each pollution project and its corresponding weight to get the corresponding comprehensive index Q. Finally, according to the air quality index obtained above, it is divided into six levels, and the air pollution index is divided into the following six levels, as shown in Table 2:

Table 2 Air quality grade

Air quality index		0~8.3	8.3~16.7
Air quality index level		Ⅰ	Ⅱ
16.7~25	25~33.3	33.3~50	>50
Ⅲ	Ⅳ	Ⅴ	Ⅵ

3. CONSTRUCTOR

First, analyze the resistance of people and environment to air pollution. When the level of air pollution changes from I to III, the weight changes

slowly. When it changes from class III to class IV, its weight changes greatly; when the air pollution level changes between IV and VI, the weight changes tend to be slow again. After comprehensive consideration, the s-shaped growth curve is constructed as follows:

$$f(x)=\begin{cases}0 & (x<0)\\ \alpha\sqrt[3]{x-\beta}+\gamma & (x\geq 0)\end{cases} \quad (3)$$

Where is the undetermined constant. In order to find the weight function, let the corresponding quantization value. You get the final one.

$$\alpha=0.35,\ \beta=3.48,\ \gamma=0.52$$

Thus, the specific expression obtained is:

$$f(x)=\begin{cases}0\\ 0.35\sqrt[3]{x-3.48}+0.52\end{cases} \quad (4)$$

Plug in

$$x_i(i=1,2,3\cdots)$$

The value of the available from Ⅰ Ⅵlevel air quality type of quantitative values (i.e., weight), respectively. In the image below, as shown in Figure 1:

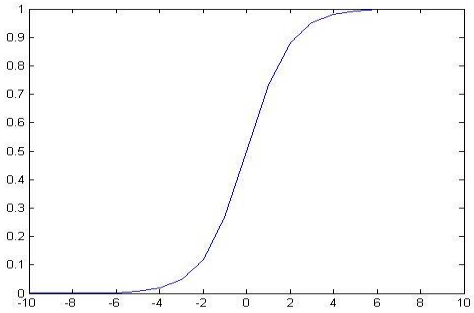

Figure 1 S variant weight function

A matrix is formed for different pollutant pollution levels at each monitoring point. The corresponding elements are substituted into the transformation weight quantization matrix, and the indexes of each row in the quantization matrix are normalized to obtain the weight matrix W. The specific normalization formula is as follows:

$$f_i'(x)=\frac{1}{f_{SO_2}(x)+f_{NO_2}(x)+f_{TSP}(x)}f_i(x) \quad (5)$$

Then, the original evaluation matrix is constructed by using the test indexes. According to the transformation into pollution categories, the comprehensive density of pollutants in the air of a monitoring point can be obtained by using the coefficient weighting method, and the corresponding air quality level of each comprehensive pollution concentration can be obtained. The following table can be used to sort and classify the major pollution sources affecting air quality, and the following comprehensive density level and corresponding pollution level can be obtained, as shown in Table 3:

Table 3 The comprehensive density level

Comprehensive air quality	Ⅰ	Ⅱ
Integrated pollution density	0~0.07	0.07~0.18
Ⅲ	Ⅳ	Ⅴ	Ⅵ
0.18~0.30	0.30~0.62	0.62~0.93	＞0.93

Extensive access to air quality assessment data and statistics. Divides into the three pollutants to air pollution levels Ⅰ, Ⅱ, Ⅲ, Ⅳ, Ⅴ, Ⅵ the six grades in the following Table 4: The pollutant concentration range with air quality standards

Table 4 The classification

Ⅰ	Ⅱ	Ⅲ
0~0.120	0.120~0.300	0.300~0.500
0~0.05	0.05~0.100	0.100~0.150
0~0.05	0.05~0.15	0.150~0.250
0~0.035	0.035~0.075	0.075~0.115
Ⅳ	Ⅴ	Ⅵ
0.500~0.5626	0.5625~0.625	＞0.625
0.150~03575	0.3575~0.565	＞0.565
0.250~0.925	0.925~1.600	＞1.600
0.115~0.150	0.150~0.250	＞0.250

4. THE OPTIMIZATION MODEL

The diffusion model of pollutants presents a gaussian distribution (normal distribution) in space, and the normal distribution function has the following relationship:

$$f(x)=\frac{1}{2\pi\sigma}\exp[-\frac{(x-u)^2}{2\sigma^2}] \quad (-\infty<x<\infty) \quad (6)$$

When there is wind, the average wind direction (i.e. direction X) of the turbulent diffusion is smaller than the average wind speed : $u_s\geq 1.5m/s$

Average transport rate, so the turbulent diffusion in the X direction is negligible. The model is based on the ground concentration of the continuous point source.

Diffusion model; However, when the wind speed is very low (), the diffusion mode of continuous point source under breezy conditions is adopted.

The formula adopted by H for flue gas uplift height is as follows:

$$\Delta H=5.5Q_h^{1/4}(dT_a/dZ+0.0098)^{-3/8} \quad (7)$$

According to the meteorological data of hebei province, we choose the diffusion coefficient with atmospheric stability of D, namely:

$$\sigma_y=0.08x/(1+0.0001x)^{0.5}$$

$$\sigma_z=0.06x/(1+0015x)^{0.5} \quad (8)$$

Known: $U=3m/s, H=50m$

9 a.m. to 3 p.m.: $C_h=406.92mg/m^3$

$V_h=10/3\ m^3/s$

10p.m. to 4a.m.: $C_h=1160mg/m^3$

$V_h=95/6\ m^3/s$

The established model is used to solve the problem. The air pollution concentration distribution and air

quality grade at 8 am, 12 noon and 9 PM respectively can be calculated by using Matlab software. As shown in the Table 5 below, the pollutant concentration range and air quality standard are divided:

Table 5. Classification of pollutant concentration quality standards

time	distance	1	2
8 a.m.	OH-	0.34	0.43
	Air quality	Ⅳ	Ⅴ
12 noon	OH-	1, 539	0.875
	Air quality	Ⅵ	Ⅴ
9 p.m.	OH-	0.25	0.41
	Air quality	Ⅳ	Ⅴ
time	distance	4	5
8 a.m.	OH-	0.11	0.043
	Air quality	Ⅱ	Ⅰ
12 noon	OH-	0.13	0.09
	Air quality	Ⅲ	Ⅱ
9 p.m.	OH-	0.151	0.06
	Air quality	Ⅲ	Ⅱ

In order to obtain the emission situation of nitrogen dioxide more intuitively, the above gaussian plume diffusion model formula was mapped with Matlab software to map the distribution diagram of nitrogen oxide concentration at 12:00 noon, which can more clearly show the division of pollutant concentration range and air quality standard. The following figure is based on gaussian plume to simulate the concentration distribution diagram of waste incinerator, as shown in Figure 2.

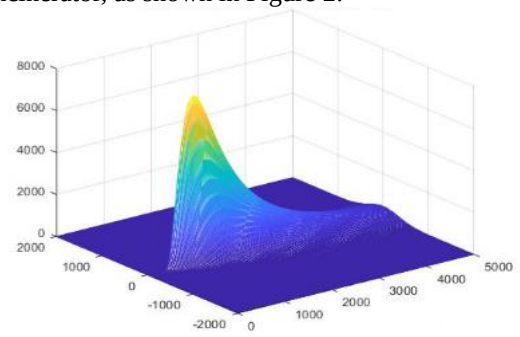

Figure 2 Concentration profile of waste incinerator

5. DATA INVERSION METHOD

A method of simulating stochastic processes. Also known as "adjoint system method", "dual system method", "conjugate system method" and so on. For the model of the system under study, the direction of information flow through each component is reversed, that is, the input and output are interchanged, and the direction of time is reversed (including the starting point and ending point of computing time are interchanged). In this way, we get the accompanying system (or conjugate system, dual system) of the original system. After replacing the studied system with an adjoint system, the mean square error of the system can be obtained by an analog computer. Due to some limitations of the inversion method, it is only applicable to linear systems, and each simulation can only be solved at a fixed time.

In order to explore the factors influencing the air quality of the beijing-tianjin-hebei region and major pollution sources, the types of pollution that discharge pollutants are divided into sectors and energy consumption types, including PM2.5, sulfur dioxide, nitrogen oxides, VOCS of volatile organic compounds and dust.

According to the table, sulfur dioxide emissions of the pollutant species in the beijing-tianjin-hebei region were the largest, and the proportion of industrial sulfur dioxide was the highest. According to different provinces and cities, tianjin has the biggest impact of industrial pollution, with higher proportion of industrial sulphur dioxide and industrial nitrogen oxide than Beijing and hebei. The proportion of industrial tobacco (powder) dust in hebei was higher than that in Beijing and tianjin.

The Table 6 below shows the respective use of coal, cokefuel oil, gasoline, kerosene and diesel in the beijing-tianjin-hebei region.

Table 6 Industrial exhaust emission

area	coal	coke	Fuel oil
Beijing	2634.62	220.45	66.69
	67.15%	5.62%	1.70%
Tianjin	4806.79	663.91	143.69
	77.85%	10.75%	2.32%
Hebei	27464.72	7319	38.53
	76.80%	20.47%	0.11%
area	gasoline	kerosene	diesel
Beijing	371.53	392.63	237.42
	9.47%	10.00%	6.06%
Tianjin	205.12	21.4	333.54
	3.32%	0.35%	5.41%
Hebei	238.75	7.34	691.94
	0.67%	0.02%	1.93%

It can be seen from the table that the main energy consumption of the beijing-tianjin-hebei region is coal, accounting for over 60%. According to different provinces and cities, the consumption of coal in Beijing is relatively low, and kerosene and diesel oil occupy a certain amount of usage; The energy consumption in tianjin is dominated by coal and supplemented by coke. Hebei province mainly USES coal and coke.

6. KEY PARAMETER ANALYSIS

Located in the heart of the bohai rim of China in northeast Asia, the beijing-tianjin-hebei region is the largest and most dynamic region in north China, attracting more and more attention from China and the whole world. In 2016, the combined GDP of the beijing-tianjin-hebei region totaled 7461.26 billion yuan, accounting for 10 percent of the country's total. It's also a big energy use province, Based on the above modeling process and data collection and analysis, the key factors affecting air quality were summarized according to the fuel emission and the

contribution of different industries. Fuel emissions are mainly the use of fossil fuel coal, in terms of industry, coal-fired power generation and heavy industry account for the largest proportion of pollutants discharged in the development process. The following table shows the percentage of pollutant fuel sources in the beijing-tianjin-hebei region, as shown in Table 7:

Table 7 Energy consumption region

species	coal	The fuel
$PM_{2.5}$	25%	49%
SO2	61%	13%
OH-	47%	16%
NH3		98%
Volatile organic matter		53%
species	oil	Biomass fuel
$PM_{2.5}$	4%	15%
SO2	22%	
OH-	18%	
NH3		
Volatile organic matter		19%

Separate fuel emissions: first, the table shows that coal is the main source of sulfur dioxide and nitrogen oxides, and non-fuel is the main source of ammonia and volatile organic compounds emissions; Secondly, in the process of combustion, non-fuel emits many pollutants simultaneously, which has a great influence on the air quality. Then, coal emits the biggest proportion of the main pollutant in the burning process. Finally, a comprehensive analysis shows that coal is the leading source of dye pollution in the beijing-tianjin-hebei region, and the impact of emissions from non-fuel combustion should not be ignored.

The proportion of sources of pollutants in the beijing-tianjin-hebei region, as shown in Table 8.

First of all, in terms of the total emission of pollutants, the energy sector (coal-fired power generation) is the largest source of pollution in the beijing-tianjin-hebei region, and the proportion of pollutants generated is the highest. Secondly, the industrial production processes, such as steel and cement, are the second largest source of pollution in the beijing-tianjin-hebei region, of which the proportion of emissions is the highest. Finally, the residential and commercial sectors are the third largest source of pollution in the beijing-tianjin-hebei region, with the most types of pollutants discharged, among which volatile organic acids are mainly produced by the residential and commercial sectors.

Table 8 The percentage of pollutant fuel sources

	Coal-fired	Industrial production	Residents
PM2.5	9%	49%	32%
SO2	69%	12%	14%
OH-	47%	17%	6%
Volatile			15%

7. CONCLUSION

By establishing the air pollution model of the beijing-tianjin-hebei region, it can be seen that the energy sector (coal-fired power generation) is the largest source of pollution in the beijing-tianjin-hebei region. It is recommended to take energy saving and emission reduction measures as soon as possible and replace coal power generation with renewable energy. Therefore, environmental crisis could not be addressed by simple technology, is not to deny the limitations of science and technology in the aspect of protecting the environment, is not to whether science and technology of the important role in protecting the environment but requires us to break through the limitations of technology determinism, put environmental protection and the sustainable development in civilization transition in the background and value of recasting to thinking. At the same time, the media should be used to advocate low-carbon life, form consumption consciousness and consumption pattern of energy conservation and consumption reduction, and improve people's awareness of environmental protection. In addition, the country should also unify the standard of governance as soon as possible to achieve the sustainable development of the economy.

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The Method of Soft Computing About Attributes- Set Pair and Application

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Abstract: The key to set pair analysis method is to computer the connection degree. The building of set pair correlation function provided a new soft computing method of describing the relationship between the collections and determining the connection degree express formula. First, based on rough set, the attribute correlation function was defined and the basic properties was discussed. Secondly, the set pair correlation function was defined and it was proved that the set pair correlation degraded into the attribute correlation function when any collection of set pair expended the whole region, The basic properties of the set pair correlation function was discussed. What's more, the synthetic operations and operation laws were given. Finally, the feasibility and practical of the set pair of soft computing method about attributes were illustrated through a case study.

Keywords: Rough set; Connection degree; Attribute correlation function; Set pair correlation function

1. INTRODUCTION

Soft computing [1-3] is a fusion of rough sets and fuzzy logic, and fault-tolerant processing of uncertain, inaccurate and incomplete truth data to achieve low cost, easy control processing and high robustness. The rough set [4-5] uses the upper and lower approximation sets to describe and approximate the set, and assigns the undetermined individuals to the boundary region; the set pair theory analyzes the set identity, difference and oppositeness of the feature by analyzing the set to prove the contact status. Rough set and set pair analysis are two important tools for the effective study of uncertainty in information systems. Many scholars have studied the fusion of them based on the idea of soft computing and applied it to many fields [6-9]. Wang Huiping etc [10] combined the rough set theory with the set pair analysis theory for the incomplete information system, and studied the set pair rough model under the incomplete information system; Liu Baoxiang [11] used the SPA method for different moments which the rough sets are compared, the set pairing degree is given, and the change of the rough set is obtained by analyzing the contact degree. Yang Yafeng etc [12] constructed the rough contact function by using the upper and lower approximations of the rough set, and proposed a rough set based. The set pair analysis method statically describes the deterministic-uncertain system formed by the rough set relative to the universe. However, the set pairing degree constructed by the rough approximation set on different attribute sets is different. So, it is necessary to explore different the dynamic change and interaction law of the set of attributes on the set of attributes; at the same time, in practical applications, it is often necessary to synthesize the set-to-contact degree to reflect the situation of the problem in real time.

Based on this, this paper proposes a new set-wise attribute soft computing method--set pair-correlation function to describe the dynamic change of uncertain systems. The second part of the article defines the attribute-related function and its properties are carried out; Part 3 of the research gives the definition of the set-associated function, discusses and proves its series of related properties; the fourth part combines the intersection operation in the set operation, and two dynamic factors in the Set pair correlation function: The attribute set and the set pair respectively, propose the combination operation of the two sets of correlation functions. The fifth part verifies the correctness of the set pair function definition and the validity and practicability of the combination operation.

2. ATTRIBUTE CORRELATION FUNCTION AND PROPERTIES

In the sense of information system, this paper defines the attribute correlation function based on the concepts of knowledge base [13] and approximate set [14-15] in rough set theory and discusses its basic properties.

Definition 1 (Attribute Association Function) Given Knowledge Base $K=(U,A)$ and Attribute Set R, The Rough set of Set $X \subseteq U$ about the Attribute set R is $\left(\underline{R}(X), \bar{R}(X)\right)$:

$$\underline{R}(X)=\{x \in U \mid [x]_R \subseteq X\}$$

$$\bar{R}(X)=\{x \in U \mid [x]_R \cap X \neq \phi\}$$

Let $\mu_R(X)=a_R+b_R i+c_R j$ be X the Attribute correlation function of Attribute set R, among them:

$$a_R=\left|\underline{R}(X)\right| \Big/ |U|, \quad b_R=\left|\bar{R}(X)-\underline{R}(X)\right| \Big/ |U|$$

$$c_R=\left|U-\bar{R}(X)\right| \Big/ |U|$$

Respectively referred to as X degree of R, degree of difference and opposition, and $a_R + b_R + c_R = 1$ satisfy normalized conditions, $i \in [-1,1]$, $j = -1$ are mark symbols.

Given Knowledge Base $K = (U, A)$ and Attribute Set $R, S \subseteq A$, make $U = \{x_1, x_2, \cdots, x_{|U|}\}$, $\omega = \{\{x_1\}, \{x_2\}, \cdots, \{x_{|U|}\}\}$, the Attribute correlation function $\mu_R(X)$ of set $X \subseteq U$ has the following properties:

Nature 1:

The necessary and sufficient condition for the Attribute correlation function $\mu_R(X) = i$ is $U/R = U$.

Prove Adequacy: When $U/R = U$, $\bar{R}(X) = U$, $\underline{R}(X) = \phi$, $a_R = 0, c_R = 0, b_R = 1$, get $\mu_R(X) = i$.

Necessity: When $\mu_R(X) = i$, $a_R = \left|\underline{R}(X)\right| \Big/ |U| = 0$, $c_R = \left|U - \bar{R}(X)\right| \Big/ |U| = 0$, then $\underline{R}(X) = \phi$, $\bar{R}(X) = U$, get $U/R = U$.

Prove up.

Nature 2:

The necessary and sufficient condition for the Attribute correlation function $\mu_R(X) = a_R + c_R j$ is $U/R = \omega$.

Prove Adequacy: By $U/R = \omega$, get:

$\bar{R}(X) = \underline{R}(X) = X$ $b_R = \left|\bar{R}(X) - \underline{R}(X)\right| \Big/ |U| = 0$

Then $\mu_R(X) = a_R + c_R j$.

Necessity: When $\mu_R(X) = a_R + c_R j$, $b_R = 0$, $\bar{R}(X) = \underline{R}(X) = X$, get $U/R = \omega$.

Prove up.

Nature 3: Make $T = R \cup S$, Collection X about Attribute T Attribute correlation function $\mu_T(X) = a_T + b_T i + c_T j$ is:

$a_T \geq a_R, a_T \geq a_S, c_T \geq c_R, c_T \geq c_S, b_T \leq b_R, b_T \leq b_S$.

Prove Let the Attribute set R, S, T be divided on U as: $U/R = \{X_1^R, X_2^R, \cdots, X_k^R\}$

$U/S = \{X_1^S, X_2^S, \cdots, X_l^S\}$ $U/T = \{X_1^T, X_2^T, \cdots, X_m^T\}$

By $T = R \cup S$, get:

$\underline{T}(X) \supseteq \underline{R}(X)$, $\underline{T}(X) \supseteq \underline{S}(X)$

$\bar{T}(X) \subseteq \bar{R}(X)$, $\bar{T}(X) \subseteq \bar{S}(X)$

$BN^T(X) = \bar{T}(X) - \underline{T}(X) \subseteq BN^R(X) = \bar{R}(X) - \underline{R}(X)$

$BN^T(X) \subseteq BN^S(X) = \bar{S}(X) - \underline{S}(X)$

$a_T = \left|\underline{T}(X)\right| \Big/ |U| \geq \left|\underline{R}(X)\right| \Big/ |U| = a_R$

$a_T = \left|\underline{T}(X)\right| \Big/ |U| \geq \left|\underline{S}(X)\right| \Big/ |U| = a_S$

$c_T = \left|U - \bar{T}(X)\right| \Big/ |U| \geq \left|U - \bar{R}(X)\right| \Big/ |U| = c_R$

$c_T = \left|U - \bar{T}(X)\right| \Big/ |U| \geq \left|U - \bar{S}(X)\right| \Big/ |U| = c_S$

$b_T = \left|\bar{T}(X) - \underline{T}(X)\right| \Big/ |U| \leq \left|\bar{R}(X) - \underline{R}(X)\right| \Big/ |U| = b_R$

$b_T = \left|\bar{T}(X) - \underline{T}(X)\right| \Big/ |U| \leq \left|\bar{S}(X) - \underline{S}(X)\right| \Big/ |U| = b_S$

Prove up.

3. SET PAIR CORRELATION FUNCTION AND PROPERTIES

3.1 Set pair correlation function

Set pairs are pairs of two sets that have a certain relationship. Set pair analysis is based on the dialectical understanding of pairwise principles and the synonymous anti-contact state between sets of collective descriptions, which can better realize the dialectic of uncertainty information processing. In the information system, combining attribute association functions, take two sets $X,\ Y \subseteq U$ to form a set pair $H(X,Y)$ in the domain U. Based on $H(X,Y)$ the upper and lower approximation sets of the set pair, the set pair pairing function is defined to make the connection between the determination and the uncertainty of the set pair analysis more objective and more effective.

Definition 2 (set pair function) Given Knowledge Base $K = (U, A)$ and Attribute Set R, Set of pairs of $X,\ Y \subseteq U$ with $H(X,Y)$ rough set of R about $\left(\underline{R}(X,Y), \bar{R}(X,Y)\right)$:

$\underline{R}(X,Y) = \underline{R}(X \cap Y) = \underline{R}(X) \cap \underline{R}(Y)$

$\bar{R}(X,Y) = \bar{R}(X \cap Y) = \bar{R}(X) \cap \bar{R}(Y)$

Let $\mu_R(X,Y) = a_R^H + b_R^H i + c_R^H j$ be set pair $H(X,Y)$. Set pair function of attribute set R, among them:

$a_R^H = \left|\underline{R}(X \cap Y)\right| \Big/ \left|\bar{R}(X \cup Y)\right|, \bar{R}(X \cup Y) = \bar{R}(X) \cup \bar{R}(Y)$

$b_R^H = \left|\bar{R}(X) \cap \bar{R}(Y) - \underline{R}(X \cap Y)\right| \Big/ \left|\bar{R}(X \cup Y)\right|$

$c_R^H = \left|\bar{R}(X \cup Y) - \bar{R}(X) \cap \bar{R}(Y)\right| \Big/ \left|\bar{R}(X \cup Y)\right|$

Respectively referred to as the degree, degree of difference and opposition of $H(X,Y)$ about R, $i \in [-1,1]$, $j = -1$ are Mark symbol, $a_R^H + b_R^H + c_R^H = 1$ Still satisfying the normalization

condition.

3.2 Set pairing function basic properties

Given Knowledge Base $K=(U,A)$ and Attribute Set R, the set pair function of set $H(X,Y)$ has the following properties:

Nature 4: When $Y=U$, $\mu_R(X,Y)=\mu_R(X)$

Prove when $Y=U$, then:

$$\underline{R}(X,Y)=\underline{R}(X\cap Y)=\underline{R}(X)$$

$$\bar{R}(X,Y)=\bar{R}(X)\cap\bar{R}(Y)=\bar{R}(X)$$

$$\bar{R}(X\cup Y)=\bar{R}(X)\cup\bar{R}(Y)=\bar{R}(U)=U$$

$$a_R^H=\left|\underline{R}(X\cap Y)\right|\Big/\left|\bar{R}(X\cup Y)\right|=\left|\underline{R}(X)\right|\Big/|U|=a_R$$

$$b_R^H=\left|\bar{R}(X)\cap\bar{R}(Y)-\underline{R}(X\cap Y)\right|\Big/\left|\bar{R}(X\cup Y)\right|$$

$$=\left|\bar{R}(X)-\underline{R}(X)\right|\Big/|U|=b_R$$

$$c_R^H=\left|\bar{R}(X\cup Y)-\bar{R}(X)\cap\bar{R}(Y)\right|\Big/\left|\bar{R}(X\cup Y)\right|$$

$$=\left|U-\bar{R}(X)\right|\Big/|U|=c_R$$

get $\mu_R(X,Y)=\mu_R(X)$.

Prove up.

Nature 5: The necessary and sufficient condition for the set pairing function $\mu_R(X,Y)=i$ is $U/R=U$.

Prove Adequacy: When $U/R=U$, $\underline{R}(X,Y)=\phi$, $\bar{R}(X,Y)=\bar{R}(X)\cap\bar{R}(Y)=\bar{R}(X\cup Y)$, then:

$$a_R^H=\left|\underline{R}(X,Y)\right|\Big/\left|\bar{R}(X\cup Y)\right|=0$$

$$b_R^H=\left|\bar{R}(X,Y)-\underline{R}(X,Y)\right|\Big/\left|\bar{R}(X\cup Y)\right|=1$$

$$c_R^H=\left|\bar{R}(X\cup Y)-\bar{R}(X,Y)\right|\Big/\left|\bar{R}(X\cup Y)\right|=0$$

get $\mu_R(X,Y)=i$.

Necessity: $\mu_R(X,Y)=i$ which is $a_R^H=0$, $b_R^H=1$, $c_R^H=0$, then $\underline{R}(X,Y)=\phi$, $\bar{R}(X,Y)=\bar{R}(X\cup Y)$, get $U/R=U$.

Prove up.

Nature 6: The necessary and sufficient condition for the set pairing function $\mu_R(X,Y)=a_R^H+c_R^H j$ is $U/R=\omega$.

Prove Adequacy: When $U/R=\omega$, then:

$$\bar{R}(X,Y)=\underline{R}(X,Y)=X\cap Y$$

$$b_R^H=\left|\bar{R}(X,Y)-\underline{R}(X,Y)\right|\Big/\left|\bar{R}(X\cup Y)\right|=0$$

get $\mu_R(X,Y)=a_R^H+c_R^H j$.

Necessity: When $\mu_R(X,Y)=a_R^H+c_R^H j$, $b_R^H=0$, $\underline{R}(X,Y)=\bar{R}(X,Y)$, $\underline{R}(X)\cap\underline{R}(Y)=X\cap Y$

get $U/R=\omega$

Prove up.

Nature 7: Let $T=R\cup S$, $H(X,Y)$ Set pair association function $\mu_T(X,Y)=a_T^H+b_T^H i+c_T^H j$ on attribute set T: $a_T^H\ge a_R^H, a_T^H\ge a_S^H$, $c_T^H\ge c_R^H, c_T^H\ge c_S^H$, $b_T^H\le b_R^H$ $b_T^H\le b_S^H$.

Prove Let the attribute set R,S,T be divided on U: $U/R=\{X_1^R,X_2^R,\cdots,X_k^R\}$

$U/S=\{X_1^S,X_2^S,\cdots,X_l^S\}$

$U/T=\{X_1^T,X_2^T,\cdots,X_m^T\}$

By $T=R\cup S$:

$$\underline{T}(X,Y)\supseteq\underline{R}(X,Y), \quad \underline{T}(X,Y)\supseteq\underline{S}(X,Y),$$

$$\bar{T}(X,Y)\subseteq\bar{R}(X,Y), \quad \bar{T}(X,Y)\subseteq\bar{S}(X,Y)$$

$$\bar{T}(X\cup Y)\subseteq\bar{R}(X\cup Y), \quad \bar{T}(X\cup Y)\subseteq\bar{S}(X\cup Y)$$

get:

$$a_T^H=\left|\underline{T}(X,Y)\right|\Big/\left|\bar{T}(X\cup Y)\right|\ge\left|\underline{R}(X,Y)\right|\Big/\left|\bar{T}(X\cup Y)\right|=a_R^H$$

$$a_T^H=\left|\underline{T}(X,Y)\right|\Big/\left|\bar{T}(X\cup Y)\right|\ge\left|\underline{S}(X,Y)\right|\Big/\left|\bar{S}(X\cup Y)\right|=a_S^H$$

$$c_T^H=\left|\bar{T}(X\cup Y)-\bar{T}(X,Y)\right|\Big/\left|\bar{T}(X\cup Y)\right|$$

$$\ge\left|\bar{R}(X\cup Y)-\bar{R}(X,Y)\right|\Big/\left|\bar{R}(X\cup Y)\right|=c_R^H$$

$$c_T^H=\left|\bar{T}(X\cup Y)-\bar{T}(X,Y)\right|\Big/\left|\bar{T}(X\cup Y)\right|$$

$$\ge\left|\bar{S}(X\cup Y)-\bar{S}(X,Y)\right|\Big/\left|\bar{S}(X\cup Y)\right|=c_S^H$$

$$b_T^H=\left|\bar{T}(X,Y)-\underline{T}(X,Y)\right|\Big/\left|\bar{T}(X\cup Y)\right|$$

$$\le\left|\bar{R}(X,Y)-\underline{R}(X,Y)\right|\Big/\left|\bar{T}(X\cup Y)\right|=b_R^H$$

$$b_T^H=\left|\bar{T}(X,Y)-\underline{T}(X,Y)\right|\Big/\left|\bar{T}(X\cup Y)\right|$$

$$\le\left|\bar{S}(X,Y)-\underline{S}(X,Y)\right|\Big/\left|\bar{S}(X\cup Y)\right|=b_R^H$$

Prove up.

4. SET PAIRING FUNCTION

The set pair function contains two sets of attribute sets and set pairs: the difference between the different representations of the attribute set and the cognition of the object determination and uncertainty, the set of things that represent the discussion, the increase of the attribute set and the set pair Or reduce the intersection of the set and the operation of the set, so this paper proposes two sets of synthetic operations based on the attribute set and the element set.

4.1 Set pair function of a correlation function on a set of attributes

Given the knowledge base $K=(U,A)$ and the attribute set R,S, For the set pairs formed by set $X,Y\subseteq U$ to $H(X,Y)$ and the set pairs associated functions of set R,S are: $\mu_R(X,Y)$、$\mu_S(X,Y)$

Definition 3 ($\cup^{\Re}$ composite operation) With set pair correlation function $\mu_R(X,Y)$ and $\mu_S(X,Y)$, Command attribute set $T=R\cup S$, call

$$\mu_R(X,Y)\cup^{\Re}\mu_S(X,Y)=\mu_{R\cup S}(X,Y)=\mu_T(X,Y)=a_T^H+b_T^H i+c_T^H j$$

is Set pair correlation function $\mu_R(X,Y)$ and $\mu_S(X,Y)$ is the synthesis operation of attribute set $R\cup S$, among them:

$$a_T^H=\left|\underline{T}(X\cap Y)\right|\Big/\left|\bar{T}(X\cup Y)\right|$$

$$b_T^H=\left|\bar{T}(X)\cap\bar{T}(Y)-\underline{T}(X\cap Y)\right|\Big/\left|\bar{T}(X\cup Y)\right|$$

$$c_T^H=\left|\bar{T}(X\cup Y)-\bar{T}(X)\cap\bar{T}(Y)\right|\Big/\left|\bar{T}(X\cup Y)\right|$$

"$\cup^{\Re}$"is Set operation function of set function on attribute set.

Since the equivalence partition U/T can be obtained by the intersection of U/R and U/S, that is, the equivalence class of U/T can be divided and refined by the equivalence classes of U/R and U/S. At this time, the equivalence class of the boundary domain is divided. Some equivalence classes are transformed into lower approximation sets, while some are transformed into upper approximation sets, and the boundary domain is reduced. Therefore, the set operations on the correlation functions $\mu_R(X,Y)$ and $\mu_S(X,Y)$ on the attribute set $R\cup S$ are to be in U/R and U/S. On the basis of looking for the equivalence class that has changed, calculate $\left(\underline{T}(X,Y),\bar{T}(X,Y)\right)$, the specific calculation method is as follows:

Step1 Given knowledge base $K=(U,A)$ and Attribute set R,S, Set pair $H(X,Y)$, get:

$\underline{R}(X,Y)=\underline{R}(X\cap Y)$, $\bar{R}(X,Y)=\bar{R}(X)\cap\bar{R}(Y)$

$\bar{R}(X\cup Y)=\bar{R}(X)\cup\bar{R}(Y)$, $\underline{S}(X,Y)=\underline{S}(X\cap Y)$

$\bar{S}(X,Y)=\bar{S}(X)\cap\bar{S}(Y)$, $\bar{S}(X\cup Y)=\bar{S}(X)\cup\bar{S}(Y)$;

Step 2 calculate $\bar{R}(X,Y)\cap\bar{S}(X,Y)$, $\underline{R}(X,Y)\cup\underline{S}(X,Y)$ and $\bar{R}(X\cup Y)\cap\bar{S}(X\cup Y)$;

Step 3 command $BN_u^*=\bar{R}(X,Y)\cap\bar{S}(X,Y)-(X\cap Y)$, $BN_l^*=(X\cap Y)-\underline{R}(X,Y)\cup\underline{S}(X,Y)$, calculated separately BN_u^*, BN_l^*;

Step 4 compare BN_u^* and $\bar{R}(X,Y)\cap\bar{S}(X,Y)$, BN_l^* and $\underline{R}(X,Y)\cup\underline{S}(X,Y)$, if $\underline{R}(X,Y)\cup\underline{S}(X,Y)$ exists in the equivalence class $X_i\subseteq BN_l^*$, X_i is incorporated into $\underline{R}(X,Y)\cup\underline{S}(X,Y)$, and $\underline{R}(X,Y)\cup\underline{S}(X,Y)$ after adding all X_i is $\underline{T}(X,Y)$; if there is an equivalence class $\bar{R}(X,Y)\cap\bar{S}(X,Y)$ in $X_j\subseteq BN_u^*$, all X_j is removed from $\bar{R}(X,Y)\cap\bar{S}(X,Y)$, remove The X_j after all $\bar{R}(X,Y)\cap\bar{S}(X,Y)$ is $\bar{T}(X,Y)$;

Step 5 command $BN_u^{'}=\bar{R}(X\cup Y)\cap\bar{S}(X\cup Y)-(X\cup Y)$

Comparing $BN_u^{'}$ and $\bar{R}(X\cup Y)\cap\bar{S}(X\cup Y)$, there is an equivalence class $X_K\subseteq BN_u^{'}$ in $\bar{R}(X\cup Y)\cap\bar{S}(X\cup Y)$, and all X_k are removed from $\bar{R}(X\cup Y)\cap\bar{S}(X\cup Y)$, and X_k after removing all $\bar{R}(X\cup Y)\cap\bar{S}(X\cup Y)$ is $\bar{T}(X\cup Y)$;

Step 6 Calculate the set pair function $\mu_T(X,Y)$ based on $\underline{T}(X,Y)$, $\bar{T}(X,Y)$and $\bar{T}(X\cup Y)$.

Definition 4 ($\cap^{\Re}$ composition operation) Set pair function $\mu_R(X,Y)$ and $\mu_S(X,Y)$, set attribute set $V=R\cap S$, let

$$\mu_R(X,Y)\cap^{\Re}\mu_S(X,Y)=\mu_{R\cap S}(X,Y)=\mu_V(X,Y)=a_V^H+b_V^H i+c_V^H j$$

For the set operation of the pair of correlation functions $\mu_R(X,Y)$ and $\mu_S(X,Y)$ on the attribute set $R\cap S$, where:

$$a_V^H=\left|\underline{V}(X\cap Y)\right|\Big/\left|\bar{V}(X\cup Y)\right|$$

$$b_V^H=\left|\bar{V}(X)\cap\bar{V}(Y)-\underline{V}(X\cap Y)\right|\Big/\left|\bar{V}(X\cup Y)\right|$$

$$c_V^H=\left|\bar{V}(X\cup Y)-\bar{V}(X)\cap\bar{V}(Y)\right|\Big/\left|\bar{V}(X\cup Y)\right|$$

"$\cap^{\Re}$"is the cross operation symbol of set to

correlation function about attribute set. Since U/V can be found from U/R or U/S, it is easy to find $\bar{V}(X,Y)$, $\underline{V}(X,Y)$, then $\mu_V(X,Y)=a_V^H+b_V^H i+c_V^H j$.

In particular, when $R\cap S=V=\phi$ is $\underline{V}(X,Y)=\phi$, $\bar{V}(X,Y)=X\cup Y$ is $\mu_R(X,Y)\cap^{\Re}\mu_S(X,Y)=i$.

Nature 8: The set operation of the set function on the attribute set satisfies the commutative law and the conjunction law:

$$\mu_R(X,Y)\cup^{\Re}\mu_S(X,Y)=\mu_S(X,Y)\cup^{\Re}\mu_R(X,Y)$$
$$\mu_R(X,Y)\cap^{\Re}\mu_S(X,Y)=\mu_S(X,Y)\cap^{\Re}\mu_R(X,Y)$$
$$\left(\mu_R(X,Y)\cup^{\Re}\mu_S(X,Y)\right)\cup^{\Re}\mu_T(X,Y)$$
$$=\mu_R(X,Y)\cup^{\Re}\left(\mu_S(X,Y)\cup^{\Re}\mu_T(X,Y)\right)$$
$$\left(\mu_R(X,Y)\cap^{\Re}\mu_S(X,Y)\right)\cap^{\Re}\mu_T(X,Y)$$
$$=\mu_R(X,Y)\cap^{\Re}\left(\mu_S(X,Y)\cap^{\Re}\mu_T(X,Y)\right).$$

Prove Exchange law: By $R\cup S=S\cup R$, $R\cap S=S\cap R$ according to the definition of 3, 4:

$$\mu_R(X,Y)\cup^{\Re}\mu_S(X,Y)=\mu_{R\cup S}(X,Y)=\mu_{S\cup R}(X,Y)$$
$$=\mu_S(X,Y)\cup^{\Re}\mu_R(X,Y)$$
$$\mu_R(X,Y)\cap^{\Re}\mu_S(X,Y)=\mu_{R\cap S}(X,Y)=\mu_{S\cap R}(X,Y)$$
$$=\mu_S(X,Y)\cap^{\Re}\mu_R(X,Y)$$

Combination law: due to the attribute set R,S,T satisfy $(R\cup S)\cup T=R\cup(S\cup T)$ $(R\cap S)\cap T=R\cap(S\cap T)$

According to the definition of 3, 4:

$$\left(\mu_R(X,Y)\cup^{\Re}\mu_S(X,Y)\right)\cup^{\Re}\mu_T(X,Y)$$
$$=\mu_{(R\cup S)\cup T}(X,Y)=\mu_{R\cup(S\cup T)}(X,Y)$$
$$=\mu_R(X,Y)\cup^{\Re}\left(\mu_S(X,Y)\cup^{\Re}\mu_T(X,Y)\right)$$
$$\left(\mu_R(X,Y)\cap^{\Re}\mu_S(X,Y)\right)\cap^{\Re}\mu_T(X,Y)$$
$$=\mu_{(R\cap S)\cap T}(X,Y)=\mu_{R\cap(S\cap T)}(X,Y)$$
$$=\mu_R(X,Y)\cap^{\Re}\left(\mu_S(X,Y)\cap^{\Re}\mu_T(X,Y)\right)$$

Prove up.

4.2 Set pairing function for the synthesis of element sets

Given knowledge base $K=(U,A)$ and R, set $X,Y,Z\subseteq U$ compose Set pair $H(X,Y)$, $H(X,Z)$

The set pair function for the attribute set is: $\mu_R(X,Y)$, $\mu_{\bar{R}}(X,Z)$.

Definition 5 (composite operation) With set pair correlation function $\mu_R(X,Y)$ and $\mu_R(X,Z)$ let

$$\mu_R(X,Y)\cup^u\mu_R(X,Z)=\mu_R(X,Y\cup Z)$$
$$=a_R^H+b_R^H i+c_R^H j$$

is set pair correlation function $\mu_R(X,Y)$ and $\mu_R(X,Z)$ composition operation on element set $Y\cup Z$, among them:

$$a_R^H=\left|\underline{R}(X,Y\cup Z)\right|\Big/\left|\bar{R}(X\cup Y\cup Z)\right|$$
$$b_R^H=\left|\bar{R}(X,Y\cup Z)-\underline{R}(X,Y\cup Z)\right|\Big/\left|\bar{R}(X\cup Y\cup Z)\right|$$
$$c_R^H=\left|\bar{R}(X\cup Y\cup Z)-\bar{R}(X,Y\cup Z)\right|\Big/\left|\bar{R}(X\cup Y\cup Z)\right|$$
$$\bar{R}(X\cup Y\cup Z)=\bar{R}(X)\cup\bar{R}(Y)\cup\bar{R}(Z)$$
$$\bar{R}(X,Y\cup Z)=\bar{R}(X\cap Y)\cap\bar{R}(X\cap Z)$$
$$\bar{R}(X,Y\cup Z)=\bar{R}(X\cap Y)\cup\bar{R}(X\cap Z)$$

"$\cup^u$"is two conjunction functions for the union of elements.

Definition 6 (composite operation) With set pair correlation function $\mu_R(X,Y)$ and $\mu_R(X,Z)$ let

$$\mu_R(X,Y)\cap^u\mu_R(X,Z)=\mu_R(X,Y\cap Z)$$
$$=a_R^H+b_R^H i+c_R^H j$$

is set pair correlation function $\mu_R(X,Y)$ and $\mu_R(X,Z)$ composition operation on element set $Y\cap Z$, among them:

$$a_R^H=\left|\underline{R}(X,Y\cap Z)\right|\Big/\left|\bar{R}(X\cup Y\cap Z)\right|$$
$$c_R^H=\left|\bar{R}(X\cup Y\cap Z)-\bar{R}(X,Y\cap Z)\right|\Big/\left|\bar{R}(X\cup Y\cap Z)\right|$$
$$b_R^H=\left|\bar{R}(X,Y\cap Z)-\underline{R}(X,Y\cap Z)\right|\Big/\left|\bar{R}(X\cup Y\cap Z)\right|$$
$$\underline{R}(X,Y\cap Z)=\underline{R}(X\cap Y)\cap\underline{R}(X\cap Z)$$
$$\bar{R}(X\cup Y\cap Z)=\bar{R}(X\cup Y)\cap\bar{R}(X\cup Z)$$
$$\bar{R}(X,Y\cup Z)=\bar{R}(X\cup Y)\cap\bar{R}(X\cup Z)$$

"$\cap^u$"is the union operator of two contact functions on the set of elements.

Nature9: The set operation of the set function on the element set satisfies the commutative law and the conjunction law:

$$\mu_R(X,Y)\cup^u\mu_R(X,Z)=\mu_R(X,Z)\cup^u\mu_R(X,Y)$$
$$\mu_R(X,Y)\cap^u\mu_R(X,Z)=\mu_R(X,Z)\cap^u\mu_R(X,Y)$$
$$\left(\mu_R(X,Y)\cup^u\mu_R(X,Z)\right)\cup^u\mu_R(X,W)$$
$$=\mu_R(X,Y)\cup^u\left(\mu_R(X,Z)\cup^u\mu_R(X,W)\right)$$
$$\left(\mu_R(X,Y)\cap^u\mu_R(X,Z)\right)\cap^u\mu_R(X,W)$$
$$=\mu_R(X,Y)\cap^u\left(\mu_R(X,Z)\cap^u\mu_R(X,W)\right).$$

Prove Exchange law: As the collections X,Y are satisfied separately $X\cup Y=Y\cup X$, $X\cap Y=Y\cap X$

By definition 5, 6:

$$\mu_R(X,Y)\cup^u\mu_R(X,Z)=\mu_R(X,Y\cup Z)=\mu_R(X,Z\cup Y)$$
$$=\mu_R(X,Z)\cup^u\mu_R(X,Y)$$

$$\mu_R(X,Y)\cap^u \mu_R(X,Z)=\mu_R(X,Y\cap Z)=\mu_R(X,Z\cap Y)$$
$$=\mu_R(X,Z)\cap^u \mu_R(X,Y)$$

Combination law: Collection satisfies $(Y\cup Z)\cup W=Y\cup(Z\cup W)$ By definition 5, 6:

$$\left(\mu_R(X,Y)\cup^u \mu_R(X,Z)\right)\cup^u \mu_R(X,W)$$
$$=\mu_R(X,Y\cup Z\cup W)$$
$$=\mu_R(X,Y)\cup^u \left(\mu_R(X,Z)\cup^u \mu_R(X,W)\right)$$
$$\left(\mu_R(X,Y)\cap^u \mu_R(X,Z)\right)\cap^u \mu_R(X,W)$$
$$=\mu_R(X,Y\cap Z\cap W)$$
$$=\mu_R(X,Y)\cap^u \left(\mu_R(X,Z)\cap^u \mu_R(X,W)\right)$$

prove up.

CASE ANALYSIS

Information System $K=(U,A)$, $U=\{x_1,x_2,\cdots,x_8\}$, A={ Height , Hair , Eye , Classification }, As shown in Table 1 below:

Table 1 Information System

Object	Height	Hair	Eye	Classification
x_1	Short	Blond	Blue	+
x_2	Short	Blond	Brown	+
x_3	Tall	Red	Blue	-
x_4	Tall	Dark	Blue	*
x_5	Tall	Dark	Dark	-
x_6	Middle	Blond	Blond	*
x_7	Middle	Dark	Dark	+
x_8	Middle	Blond	Blond	+

Let R=(Height), S=(Hair), by $X=\{1,2,7,8\}$, $Y=\{1,2,5,6\}$, $Z=\{1,2,6,7\}$ Composition set pair $H(X,Y)$ and $H(X,Z)$.

(1) In information system $K=(U,A)$, rough set X is based on attribute set R attribute correlation function $\mu_R(X)=1/4+3/8i+3/8\,j$, Attribute correlation function based on attribute set S : $\mu_S(X)=7/8i+1/8\,j$, make $T=R\cup S$, based on Attribute correlation function $\mu_T(X)=3/8+2/8i+3/8\,j$

(2)Set pair $H(X,Y)$ set pair function based on attribute set R : $\mu_R(X,Y)=2/8+3/8i+3/8\,j$, based on attribute set S attribute correlation function $\mu_S(X,Y)=i$, Set pair $H(X,Z)$ based on Set pair correlation function $\mu_R(X,Z)=2/5+3/5i$.

Let pair correlation function $\mu_R(X,Y)$ and $\mu_S(X,Y)$, based on $R\cup S$ and $R\cap T$ Combined respectively for:

$$\mu_R(X,Y)\cup^{\mathfrak{N}} \mu_S(X,Y)=\mu_T(X,Y)=2/7+5/7\,j$$
$$\mu_R(X,Y)\cap^{\mathfrak{N}} \mu_S(X,Y)=\mu_V(X,Y)=2/8+3/8i+3/8\,j$$

Set pair correlation function $\mu_R(X,Y)$ and $\mu_R(X,Z)$, based on $Y\cup Z$ and $Y\cap Z$ combined respectively for:

$$\mu_R(X,Y)\cup^u \mu_R(X,Z)=2/8+3/8i+3/8\,j$$
$$\mu_R(X,Y)\cap^u \mu_R(X,Z)=2/5+3/5i.$$

The case study shows that the set-pair correlation function can clearly show the mutual transformation relationship and variation law among the same, different and opposite in the correlation function under different equivalence partitions; the synthesis operation of the set pair function can be performed efficiently by the intersection, union and difference operations of the approximate set.

5. CONCIUSION

In the sense of information system, the approximation operator theory of rough set is applied to the construction of set pair correlation function, and the set pair attribute soft calculation method based on rough set theory approximation set is proposed. The set pair attribute function is based on different attribute sets. The dynamic feature determines the set-pair correlation function of the rough set based on the new attribute set by the intersection, union and difference operations between the original approximate sets, and gives the synthesis operation and operation law of the set pair correlation function. These studies are set pairs. The calculation of the correlation function provides a new method. It is necessary to further study the application of set-pair correlation function to decision-making, prediction and comprehensive evaluation.

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Research on the Influence of Shared Bicycles on City based on EWM-AHP Coupling Evaluation Model

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Abstract: Shared bicycles have changed the urban traffic conditions in many cities, and many large cities have introduced shared bicycles to solve traffic problems. To assess the impact of shared bicycles on the city. Firstly, the evaluation index system for urban transportation, economy, environment and society is established respectively. The coupling evaluation model based on entropy weight method-analytic hierarchy process is constructed by analyzing the subjectivity and objectivity of entropy weight method and AHP. Then, the eigenvalue analysis method is used to obtain the index weights of the criterion layers of the four evaluation systems. For some qualitative indicators, the weights of the indicators for the program layer are obtained by constructing the judgment matrix. Secondly, look up the relevant data of Beijing from 2015 to 2017 and use the entropy weight method to find the weight of the program layer for quantitative indicators. Finally, the weights of different vehicles on different aspects of the city are obtained, and analyzed and evaluated.
Keywords: Shared bicycle; Entropy weight method; Analytic hierarchy process; Evaluation index

1. INTRODUCTION

In China's transportation industry, there have been many changes and developments before and after, and eventually evolved into different modes of transportation such as taxis, drip taxis, and shared bicycles. The birth of each new mode of transportation will have different impacts on society, especially the emerging industry of sharing bicycles, which has changed the transportation structure and passenger transportation resources to a certain extent. Because shared bicycles have the characteristics of low cost, easy to use, and accompanying, people may prefer to share bicycles instead of taxis, which undoubtedly makes an important contribution to alleviating traffic pressure. This article focuses on the impact of shared bicycles on urban transport, economic, environmental and social aspects.

2. ESTABLISH AN EVALUATION INDEX SYSTEM FOR SHARED BICYCLES

In order to study the impact of bicycle sharing on urban transportation, as well as the related economic, social and environmental impact, we first need to build an evaluation index system on urban transportation, economy, society and environment.

Selection of evaluation indicators should follow several principles: (1) functional principles, that is, indicators to have the description of the function, evaluation function and interpretation function; (2) the principle of availability, that is, index data to be able to obtain from authoritative publications, media or other channels; (3) the principle of comparability, indicators in the meaning, statistical caliber and time and space to have comparability; (4) integrity principle; (5) non-overlapping principle; (6) the principle of combining quantitative and qualitative indicators. According to the above principles, we obtain an indicator system for the impact of shared bicycles on urban traffic conditions as shown in Figure 1. The index system of sharing bicycles on urban economic, social and environmental impacts is similar.

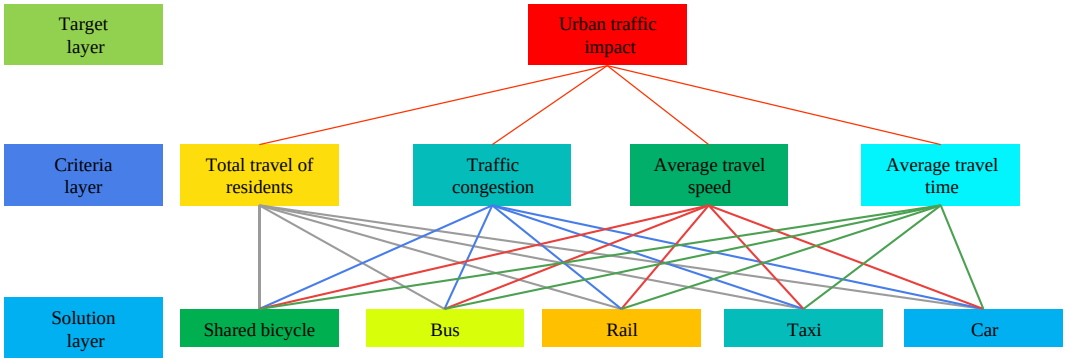

Figure 1 influence of bicycle sharing on urban traffic conditions

3. MODEL — BASED ON THE EWM - AHP COUPLING EVALUATION MODEL

Analytic hierarchy process (AHP) considers the knowledge and experience of experts, as well as the intention and preference of decision makers. Although the ranking of index weights is often highly reasonable, it still cannot overcome the defect of greater subjective arbitrariness. Entropy weight method fully excavates the information contained in the original data itself, and the results are objective, but it cannot reflect the knowledge and experience of experts and the opinions of decision makers. Sometimes, the weight obtained may not be consistent with the actual importance, or even contrary. Therefore, this paper combines entropy weight method and analytic hierarchy process to calculate the weight of each index.

We respectively studied the impact of bicycle sharing on the urban traffic situation, economy, society and environment of Beijing, and mainly take the sharing bicycle as an example to discuss the urban traffic situation in detail.

3.1. Determine qualitative indicator weights based on analytic hierarchy process

Analytic Hierarchy Process (AHP) is a qualitative and quantitative decision analysis method [1], which reduces the number of index layers and the number of indicators through calculation, compares and calculates each indicator, and then obtains the weight of different indicators.

Taking the sharing bicycle as an example to elaborate the urban traffic situation, the basic steps for AHP to determine the index weight are as follows:

① Hierarchical analysis model is established

In the chapter 2, “establishment of evaluation index system”, four hierarchical analysis models have been established, and the decision-making objectives, decision-making criteria and decision-making objects are divided into the highest level, the middle level and the lowest level according to their mutual relations.

② Construct judgment matrix and assignment

According to experts’ preference for each evaluation index, the pairwise comparison of the four indexes constructs the judgment matrix A as:

$$A=\begin{bmatrix} 1 & 3 & 1/3 & 1/2 \\ 1/3 & 1 & 1/5 & 1/4 \\ 3 & 5 & 1 & 2 \\ 2 & 4 & 1/2 & 1 \end{bmatrix} \tag{1}$$

③ Calculated judgment matrix A feature vector and weight

Each column of the judgment matrix A is normalized, and its element general term is:

$$a_{ij}=\frac{a_{ij}}{\sum_{i=1}^{n} a_{ij}} \tag{2}$$

Then, the normalized judgment matrix B of each column is added as rows

$$a_i=\sum_{j=1}^{n} a_{ij} \tag{3}$$

And then for the vector a is equal to a = (a1, a2, ..., an). T is normalized to obtain the weight vector of the attribute:

$$\omega_i=\frac{a_i}{\sum_{i=1}^{n} a_i} \tag{4}$$

Finally, the maximum characteristic root of A is found:

$$\lambda_{\max}=\frac{\sum_{i=1}^{n}(A\omega)_i}{n\omega_i} \tag{5}$$

④ Consistency check

The weight of the index can be obtained by normalizing the matrix. Therefore, it is necessary to test the consistency of the judgment matrix, that is, to calculate the random consistency ratio (CR) of the judgment matrix.

Step 1 Conformance index CI

$$\mathrm{CI}=\frac{\lambda_{\max}-n}{n-1} \tag{6}$$

Step 2 Checking the table to determine the corresponding average random consistency index RI. The average random consistency index RI corresponding to different orders of the judgment matrix is shown in Table 2.

Table 2 RI table.

Order	1	2	3	4	5	6	7	8
RI	0	0	0.52	0.89	1.12	1.26	1.36	1.41

Step3 Calculate the consistency ratio CR

$$CR = \frac{CI}{RI} = \frac{0.017}{0.89} = 0.019 \quad (7)$$

When CR<0.1, the consistency of judgment matrix A is acceptable.

3.2. Determine quantitative index weight based on entropy weight method

By referring to relevant data [2], all kinds of attribute index data of Beijing's Shared five means of transportation, namely bicycle, bus, rail, taxi and car, from 2015 to 2017 can be obtained, as shown in Table 3 and Table 4.

Table 3 resident trips (Unit: million trips/day)

Year	Shared bicycle	Bus	Rail	Taxi	Car
2015	0.23	4.49	4.52	0.65	5.77
2016	1.12	3.96	4.81	0.62	5.75
2017	2.28	6.18	6.00	1.10	9.34

Table 4 Speed of each vehicle (unit: km/h)

Year	Shared bicycle	Bus	Rail	Taxi	Car
2015	9.8	7.1	11.6	9.1	14.9
2016	9.1	9.4	14.6	10.7	15.4
2017	9.1	9.8	15.3	10.9	15.9

Note: the speed of each vehicle is the average speed of morning and evening rush hours. Morning peak (7:00-8:00am), evening peak (17:00-18:00pm)

Entropy is a measure of the uncertainty of system state [3]. Entropy can be used to measure the information contained in the index data in the evaluation index system and determine the weight of each index according to it. The steps are as follows:

Step1 Data standardization

The 5 index data in table 3 are standardized [4]. Let's set the 5 index bits Xi={x1, x2, x3, x4, x5}, and the standardized value Yi={y1, y2, y3, y4, y5}, then

$$Y_{ij} = \frac{x_{ij} - \min x_i}{\max x_i - \min x_i} \quad (8)$$

Standardized data can be obtained from equation (8), as shown in Table 5.

Table 5 standardized resident trips

Year	Shared bicycle	Bus	Rail	Taxi	Car
2015	-0.56561	-0.84504	-1.27475	-0.93052	-1.08746
2016	0.37356	-1.14725	-0.81265	-0.98203	-1.09824
2017	1.59765	0.1186	1.08354	-0.15795	0.83634

Table 6 standardized traffic speed

Year	Shared bicycle	Bus	Rail	Taxi	Car
2015	-0.06018	-1.76871	-1.64353	-0.56262	-0.39717
2016	-0.58678	0.30682	0.42815	0.59148	0.31206
2017	-0.58678	0.66778	0.91154	0.73574	1.0213

Step2 Information entropy of each index Ej

According to the definition of information entropy, the information entropy of the j-th index in the evaluation matrix Y is

$$E_j = -\frac{1}{\ln m}\sum_{i=1}^{m} y_{ij} \ln y_{ij} \quad (9)$$

If the information entropy of an index is lower, it indicates that the index is worth more variation, and the more information it provides, the greater the role it can play in the comprehensive evaluation and the greater its weight. On the contrary, the higher the information entropy of an index is, the smaller the variation degree of the index is, the less information it provides, and the smaller the role it plays in the comprehensive evaluation and the smaller its weight is [5].

Therefore, the information utility value of an index depends on the difference between the information entropy Ej and 1 of the indices.

$$\omega_j = \frac{1 - E_i}{5 - \sum E_i} \quad (i = 1,2,3,4,5) \quad (10)$$

The index weight of the scheme layer in the urban traffic situation system can be obtained, as shown in Figure 2. The index weight of the scheme in the urban traffic, economic, social and environmental systems can also be obtained.

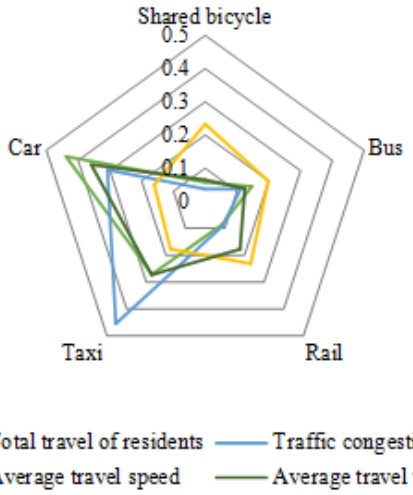

Figure 2 index weight of scheme layer in urban traffic condition system

3.3 Influence the results

In view of the urban traffic situation, the weight of Shared bicycles, buses, rail transit, taxis and cars can be obtained by the analytic hierarchy process and setting four evaluation criteria. Therefore, the impact of each vehicle on the traffic situation can be

quantitatively analyzed. The weights are shown in Table 7 in turn:

Table 7 index weight of urban traffic situation system

Index	Weight
Shared bicycle	0.19027727
Bus	0.191165
Rail	0.22518511
Taxi	0.18706661
Car	0.20640601

As can be seen from table 7, five different means of transportation have different influences on urban traffic conditions, while Shared bicycles rank fourth among the five different means of transportation. But its weight to urban traffic amounted to 0.1902.This means that bike sharing does not have a low impact on Beijing's urban traffic, because in the judgment of the criterion layer, it contains a high weight of the number of vehicle users and the time of peak use, which to some extent makes up for the disadvantages of low speed of bike sharing and insufficient ability to alleviate traffic congestion.

On the other hand, the traffic situation of the city is mainly determined by these five means of transportation, while the other unmentioned ones, such as electric bicycles and minivans, have a low impact on the urban traffic of Beijing due to their small number and frequency of use, which can be ignored. In comparison with life, this is like the actual situation in Beijing.

Thus, sharing bicycles has a stronger influence over other means of transportation.

In addition, due to the short time of bicycle sharing, some bikes were not put into use completely in the statistical age of this paper, so the influence of bicycle sharing on urban transportation may be even greater now.

Similarly, we can get the impact of Shared bikes on urban economy, society and urban environment, and the obtained index weight is shown in Figure 3.

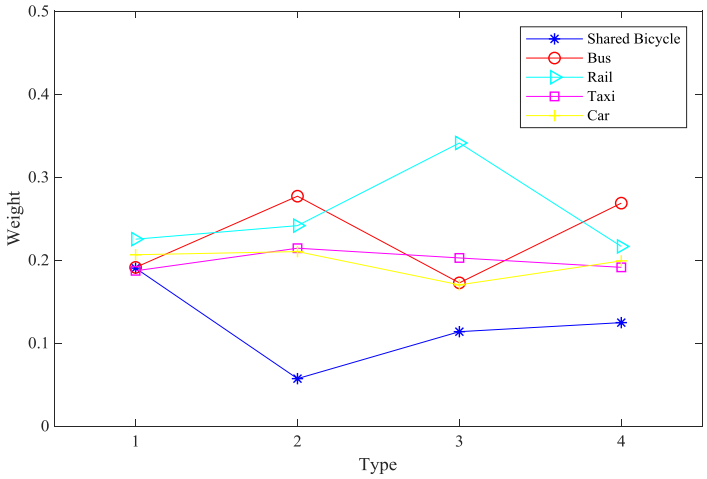

Figure 3 index weight of bicycle sharing on urban traffic, economy, society and urban environment

The Figure 3 shows that for the urban environment, also by the analytic hierarchy process (AHP), peak on carbon dioxide emissions, transport distance, average daily traffic energy consumption, noise pollution 4 criterion layer standard to judge the impact of transport on urban environment.

Among them, there is no carbon emission and traffic energy consumption, so the weight of Shared bicycle is zero in these two aspects, and for noise pollution, the pollution of Shared bicycle is less, which directly leads to the total weight of Shared bicycle is only 0. 0571.Therefore, it can be inferred that sharing bicycles has a low impact on urban environment under these four levels.

Under this condition, buses have become the means of transportation with the greatest impact on urban environment, because of their carbon emissions, unit traffic energy consumption, and driving distance are not low. According to literature, bus noise is the culprit of cities, which is also consistent with the high weight of 0.2770.

For urban economic situation, we chose the government policy tools, vehicle ownership, travel cost and comfort as the evaluation criterion, through literature and expert analysis, there is reason to believe that urban economy better place its comfort travel costs and tools will be higher, and the government policy will be easier.

For example, the weight analyzed by entropy weight method can be used to obtain that the Shared bicycle is more susceptible to fluctuations caused by government policies than the car, which is indeed the case. Under the evaluation of the criterion layer in this paper, the weight of bicycle sharing is only 0.1137, which cannot strongly reflect the economic advantages and disadvantages of a city. Through data query [6], bicycle sharing covers almost all Chinese cities, and its travel cost and tool comfort have not changed much, so it is difficult to reflect. On the contrary, the economy of a city can be judged by the operation of rail. In China, most cities with low economic level can hardly operate rail. This is also consistent with the high weight of 0.3411.

In view of the urban social situation, in order to

connect with the means of transport, we selected the safety factor of the means of transport, the number of accidents, to reflect the harmony of the social situation, through the convenience of travel and the number of roads and platforms to reflect the perfection of the social situation. Then the EWM - AHP coupling evaluation model was used to quantitatively analyze the impact of bicycle sharing on the social situation.

Due to Shared cycling the travel safety coefficient is low, so the analytic hierarchy process to obtain low weight about this, as the platform for roads and many also do not have too much to do, even if it can have higher weight in terms of convenience, also can't completely offset, so that the whole sharing bike for social influence is small, the weight is only 0.1246.This and the sharing of bicycles in various cities have been put in place can also be reflected.

4. CONCLUSIONS

The article synthesizes various influencing factors and quantitatively and qualitatively analyzes the impact of shared bicycles on urban transportation, economy, environment and society using entropy weight method-analytic hierarchy process evaluation model. The weights of all aspects of shared bicycles are obtained separately, which intuitively shows the impact of shared bicycles on the city during urban development.

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Exploring the Influence Law of Hot-Rolled Ribbed Steel Bars

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Abstract: In this paper, the relationship between different elements and the properties of deformed steel bars is analyzed. The stepwise regression method is used to analyze the variation law between V, Mn and Cr when the yield strength, tensile strength and elongation at break are satisfied. The study found that the variation law between the three is similar, controlling the two elements in V, Mn and Cr to be unchanged, and fitting the remaining elements with yield strength, tensile strength and elongation at break, considering cost factors. The content of V and Mn may be appropriately reduced. However, the content of different elements should be controlled at an intermediate limit, for example, V is 0.06%, Mn is 1.40%, and at the same time, the Cr content is controlled to be less than 0.03%.
Keywords: Influence law; Steel bars; Hot-Rolled ribbed

1. INTRODUCTION

Hot-rolled steel bars are finished steel bars that are hot-rolled and naturally cooled, and are pressed from low-carbon steel and ordinary alloy steel at high temperature. It is mainly used for reinforcement of reinforced concrete and prestressed concrete structures, and is also one of the most used steel products in civil engineering construction. Hot-rolled steel bars should have a certain strength, that is, yield point and tensile strength. It is the main basis for structural design. It is divided into two types: hot-rolled round bar and hot-rolled ribbed bar. Hot-rolled steel bars are soft and rigid, which will cause necking when broken and have a large elongation. The hot-rolled ribbed steel bar adopts a micro-alloying method, that is, adding expensive trace elements (such as Mn alloy material, V-alloy material, etc.) to the steel, adjusting the composition ratio, and improving the structural performance. A good composition design can effectively guarantee performance and control production costs at the same time. The element Cr in steel can significantly improve strength, hardness and wear resistance. Elements such as C, Mn, S, P, Si, Cr, Mo, Cu, Ni, Alt, V influence the properties of the deformed steel [1, 2]. What are the main factors affecting the performance of deformed steel bars? Is there a correlation between these factors? Can we establish a model for the influence of the properties of the steel bars and the chemical elements such as C, Mn, Cr, V, N?

Based on this, this paper attempts to apply modern mathematics and statistical methods to simulate the influence of different chemical elements on deformed steel bars, and hopes to provide theoretical guidance for actual production.

2. ANALYSIS OF FACTORS AFFECTING HOT-ROLLED RIBBED STEEL BARS

Mechanism analysis of the influence of chemical composition on performance

2.1 C element

The interstitial compound formed by carbon and iron is called the cementite is a component of the iron-carbon phase diagram. Carbon plays an important role in the strength. As the carbon content increases, the cementite increases, and the strength and hardness of the steel bar rise. However, plasticity and toughness decrease.

2.2 Mn element

The addition of Mn can shift the "S" in the Fe-C phase diagram to the left, increasing the number of pearlites in the matrix. Therefore, in the case of the same carbon content, the amount of pearlite increases as the amount of ferrite decreases and the strength is increased.

2.3 Si element

Si dissolves in ferrite to form a solid solution, which can significantly increase the strength of the steel and act as a solid solution. When the Si content exceeds 0.8 to 1.0%, the reduction in the area of the fracture is caused, and particularly the impact toughness is remarkably lowered.

2.4 P&S element

In general, P and S are harmful elements in steel. It has strong solid solution strengthening effect, which significantly increases the strength and hardness of steel, but greatly reduces the toughness of steel, especially low temperature toughness, resulting in cold brittleness.

2.5 Correlation analysis

First, processing large amounts of data, different physical units of different indicators, there are differences in the size of the data, therefore, we use SPSS to standardize the data, and in order to avoid the impact of abnormal values on the data, we remove the Z value score -3 to 3 outside the data, then process the data to make it discrete. In order to emphasize the effect of chemical elements on different properties, the data were divided into three groups based on the properties of yield strength, tensile strength and elongation at break, width of 0.002 as the split, each get 499, total 1497 sets of data [3-5], as shown in Figure 1.

According to Q - Q figure shows that all the data in line with normal distribution, therefore, the data analysis, if the correlation coefficient P <0.05, there is a correlation. According to SPSS calculation results, the correlation coefficient between the yield strength and the tensile strength is 0.801, showing a high positive correlation, but their correlation coefficients with the elongation at break were -0.206 and -0.240, respectively, showing weak negative correlation.

The correlation coefficient analysis method was used to analyze the correlation between the chemical composition of steel bars and the tensile strength, yield strength and elongation of the three major performance indexes. The correlation coefficients are shown in Table 1, Table 2, and Table 3.

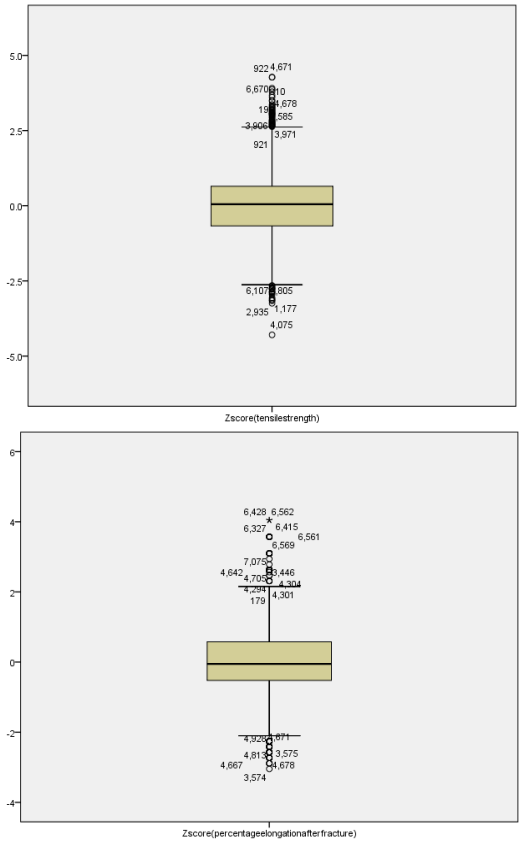

Figure 1: Data analysis result

Table 1. The correlation between the tensile strength and chemical strength

Chemical composition	C	Mn	Si	S	p
Correlation coefficient	0.8352	0.9475	0.9431	-0.2218	0.6192

Table 2. The correlation coefficient between the yield strength and chemical strength

Chemical composition	C	Mn	Si	S	p
Correlation coefficient	0.8143	0.9475	0.9432	-0.2266	0.6083

Table 3. The correlation coefficient between the extensibility and chemical strength

Chemical composition	C	Mn	Si	S	p
Correlation coefficient	-0.7014	-0.8399	-0.8270	0.2553	-0.5320

It can be seen from the correlation coefficient of Table 3 that the tensile strength of steel is highly positively correlated with the chemical composition of steel (C, Mn, Si, P) and negatively correlated with S.

It can be seen from the correlation analysis of Table 4 that the elongation of steel is slightly positively correlated with the chemical composition (S) content of steel; it is significantly negatively correlated with the chemical composition (C, Si, P), and chemical composition (Mn). The content is highly negatively correlated. In summary, the chemical composition has a great correlation with the performance of steel.

3. DEFORMATION STEEL BAR PERFORMANCE INFLUENCE MODEL ESTABLISHMENT

In this paper, based on the stepwise regression theory, the model of deformation steel bar performance is established. The main idea of the model is based on the principle of least squares method, which eliminates the factors that have no influence on the performance of hot-rolled rib bars or the influence of the factors, and selects the significant factors. Finally, the optimal regression model between the properties of the deformed steel bars and the chemical elements with significant influences is obtained [5-7], as shown in Figure 2.

(1) Establish the initial multiple regression model

If k independent variable factors that may affect the dependent variable y have been determined, the following k-ary linear actual regression model and simulated prediction model can be established:

$$y = a_0 + a_1 X_1 + a_2 X_2 + ... + a_K X_K + e \quad (1)$$

$$\hat{y} = a_0 + a_1 X_1 + ... + a_k X_k \quad (2)$$

Then the dispersion between the estimated value and the observed value is:

$$e = y - \hat{y} \quad (3)$$

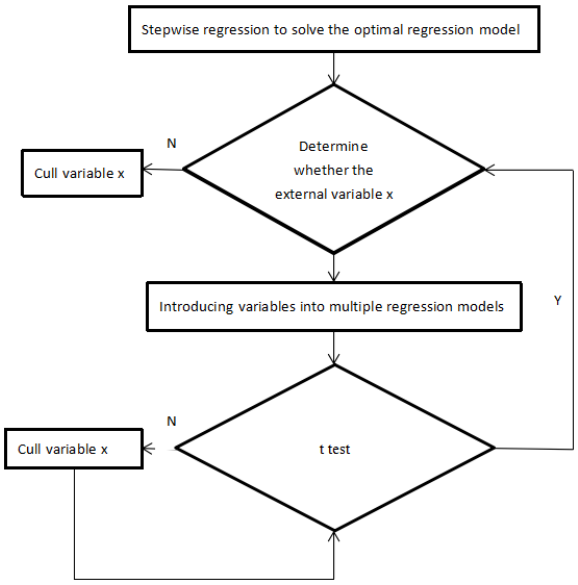

Figure 2: Data processing flow

(2) Stepwise regression to establish an optimal regression model

Through the above steps, the regression equation of steel properties and chemical elements is obtained. Respectively, the elements Si, ALT, Cr, C, Mo, Mn, V, Cu, S, P, and Ni are used to indicate tensile strength, yield strength, and elongation, respectively.

$$y_t = 0.012 + 0.113x_1 + 0.316x_2 - 0.110x_3 + 0.086x_4 - 0.036x_5 - 0.036x_6 + 0.026x_7 \quad (4)$$

$$y_y = 0.011 + 0.106x_1 + 0.322x_2 - 0.086x_3 + 0.070x_4 - 0.045x_6 + 0.041x_7 - 0.037x_8 - 0.036x_5 \quad (5)$$

$$y_p = 0.040 + 0.454x_2 - 0.086x_7 - 0.067x_9 + 0.042x_{10} + 0.037x_5 + 0.070x_{11} - 0.054x_3 \quad (6)$$

4. SIMULATION RESULTS ANALYSIS

4.1 Analysis of the interaction between V, Mn and Cr

According to the results of regression analysis, when the deformation of steel to meet the pass rate, that is to say, when the yield strength, tensile strength and elongation at break satisfy the conditions, analysis of the relationship between Cr, V, Mn three, the study found, When the yield strength, tensile strength and elongation are unchanged, Cr, V, Mn, the interaction between the three trends are basically the same, as shown in Figure 3.

4.2 Relationship between the content of element V and the mechanical properties of steel

According to the results of regression analysis, according to the principle of statistics, the measured data of product 1 were analyzed, depicting the relationship between the V content and mechanical properties of steel bars. The figure shows, With the increase of the content of element V, the performance of Hot-rolled ribbed bars showed an upward trend, the content of element V content increased 0.01% yield strength can be increased about 2Mpa, tensile strength increased about 3Mpa.

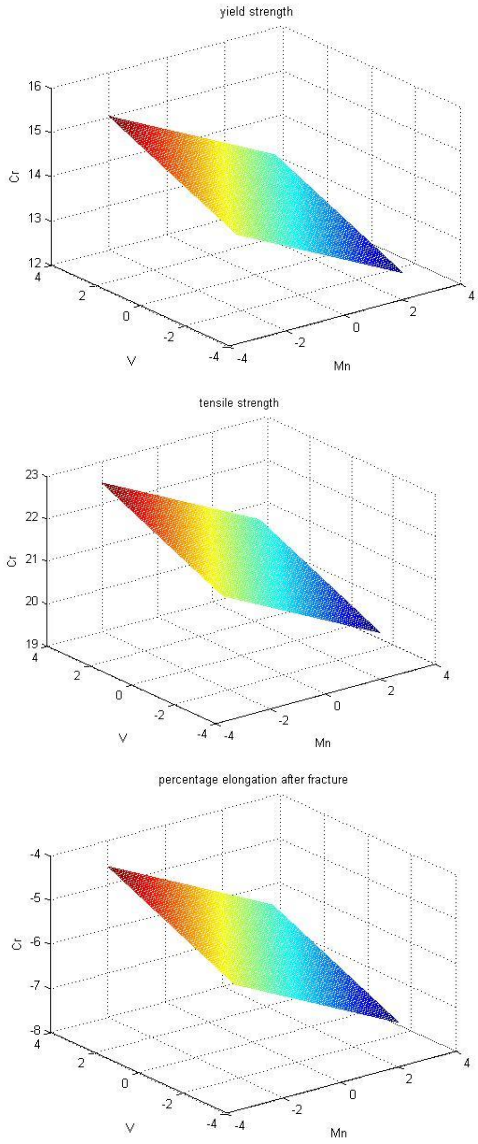

Figure 3. Analysis of the action trend of Cr, V and Mn

4.3 Relationship between the content of element Mn and the mechanical properties of steel

According to the results of regression analysis, according to the principle of statistics, the measured data of product 1 were analyzed, depicting the relationship between the V content and mechanical properties of steel bars. The figure shows, With the increase of the content of element Mn, the performance of Hot-rolled ribbed bars showed an upward trend, the content of element V content increased 0.01% yield strength can be increased about 5Mpa, tensile strength increased about 10Mpa.

4.4 Relationship between the content of element Cr and the mechanical properties of steel

According to the results of regression analysis, according to the principle of statistics, the measured data of product 1 were analyzed, depicting the relationship between the V content and mechanical properties of steel bars. The figure shows, With the increase of the content of element Cr, the performance

of Hot-rolled ribbed bars showed an upward trend, the content of element V content increased 0.01% yield strength can be increased about 24Mpa, tensile strength increased about 30Mpa.

In summary, In the process of casting steel, increasing the content of elemental Cr, can reduce the content of elements V and Mn

4.5 Optimization Analysis of Mechanical Properties of Hot-rolled ribbed bar

China's hot-rolled ribbed steel bar chemical composition of the relevant standards are as follows Table 4.

Table 4. The standard of chemical constitution in GB1499.2-2007

Number	C	Mn	Si	P	S	Ceq
HRB335	0.25	0.80	1.6	0.045	0.045	
HRB400	0.25	0.80	1.6	0.045	0.045	0.52
HRB500	0.25	0.80	1.6	0.045	0.045	0.54
HRB235	0.25	0.30	0.65	0.045	0.050	0.55
HRB300	0.25	0.50	1.50	0.045	0.050	

The proportion of chemical elements added is different, the cost of hot rolled steel there is a big difference, the chemical element prices are as follows Table 5:

Table 5. Chemical V, Mn and Cr cost comparison table

Species	Price	Increased costs
Cu	4.3870	25
Al	11.4230	90
Ni	8.9900	50
Mn	1.3750	6
Si	1.1600	6
Cr	5.2000	26
V	250.0000	1500
Mo	18.5000	110
Cu	4.3870	25
Al	11.4230	90
Ni	8.9900	50

Considering the cost of different metal elements, combined with the relevant national standards and the premise of the lowest cost, the following conclusions can be drawn:

When the content of element V is 0.04% to 1.30%, resulting in the mechanical properties of steel is not up to the proportion was65.63%;

When the content of element Mn is 1.10% to 1.30%, resulting in the mechanical properties of steel is not up to the proportion was 71.47%;

When the content of element Cr is 0.16% to 0.20%, resulting in the mechanical properties of steel is not up to the proportion was 79%.

5. CONCLUSION

In summary, the content of chemical elements V, Mn and Cr are different, and the properties of deformed bars are changed, when the conditions meet the relevant national standards, optimize the chemical elements V, Mn and Cr content, combined with the relevant cost calculation analysis, Element V, Mn content can be appropriately reduced, but not too low, should be controlled in the vicinity of the middle(V: 0.06%, Mn: 1.40%), at the same time, the content of Cr should be controlled in the upper and middle limits, should not be too high(0.03%).

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Mars Immigration Program

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Abstract: This paper presents a model to maximize the economic output of labor and job satisfaction and the scope of sustainable development. We build an adaptive system and define its dynamics. We use real-world census data (PUMS 2015) to simulate and find the optimal feasible solution. Based on this solution, a strategy to improve the living conditions of Martian human immigrants was proposed. The model can handle population scalability, social development patterns, and evolutionary dynamics. First, we constructed a parameter framework that combines variables in income, education, and social equality. We include the basic parameters that exist in the census database, from which indicators that reveal social characteristics can be derived. Key parameters are determined by analytic hierarchy process, in which happiness index is an important comprehensive evaluation of citizen welfare. Second, we set the standard for selecting 10,000 immigrants to zero population. Compared to the selected group, we generated a random sample by extracting data from the PUMS 2015 database of 1,618,489 US citizens. We studied the demographics of selected groups and random samples. The selected group showed a clear advantage in building a successful society.
Keywords: Adaptive system; Population scalability; Parameter framework; Happiness index

1. INTRODUCTION

In 2095, Mars has completed a series of short-term planned life experiments. A group of people called Population Zero will migrate to Mars. In addition to all the advanced technologies that make life on Mars possible, you should also design an optimal strategy for labor, economics and education to promote the development of Population Zero. Our team will inevitably establish a policy model that includes a series of policy recommendations that will develop a sustainable life plan. In order to find the best strategy, we need to build a model, run the simulation and present the results of the visualization. Our model should be scalable, multi-level and dynamic. But if the two goals contradict each other, they should be chosen. The three balance factors are income, education and equality.

2. PARAMETER DEFINITIONS

The American Community Survey (ACS) Public Use Microdata Sample (PUMS) is a group of 284 different undocumented records, including population [1-4], housing, and housing records for relationships, gender, education, employment status, and more. This is convenient for those looking for a low-cost data research project. However, it is worth noting that PUMS does not contain information for people under the age of 16.

To quantify the characteristics of the 0 population, we clarified the basic parameters that will be applied in our model. The parameters are categorized according to the described objects and aspects of the results [5-9].

There are three layers of parameters that provide quantitative information on Population Zero at the individual, family, and social levels. At all levels, the important factors related to income, education and peace are taken as parameters. Figure 1 below illustrates the clear structure of the main parameters.

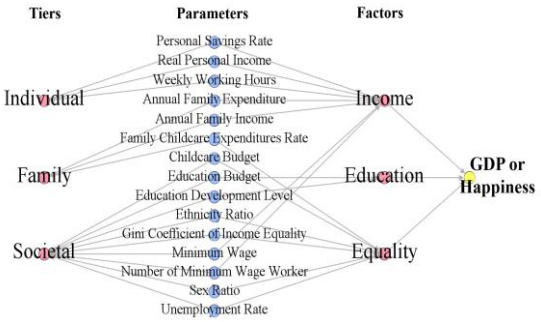

Figure 1 Hierarchical map

(2) The design of A/D acquisition circuit

In order to simplify the three-layer basic parameters, we designed a comprehensive index system to provide a more detailed quantitative description of Population Zero and attempt to reveal the relationship or dependence between parameters [10-13].

At the individual level, personal income and personal savings rate are the most important parameters. The relationship between them is as follows, according to the US Bureau of Economic Analysis.

$$DPI = RPI * (1 - r_{tax}) \quad (1)$$

RPI is actual personal income (adjusted according to inflation, but equals personal income in our model), DPI is disposable personal income, and r_{tax} is tax

rate.

$$r_s = \frac{DPI - PCE}{DPI} \tag{2}$$

PCE is personal consumption expenditure and r_s is personal savings rate. $r_s < 0$ said his income could not meet his expenses and was therefore in a bad state. If $r_s \geq 0$ is low, then he is in good shape and does not need to worry about the future. If $r_s \geq 0$ is high, then he is in good shape, but he must worry about his future.

At the household level, parenting accounts for a large portion of household expenditures.

$$r_{ce} = \frac{F_c}{F_{\exp}} \tag{3}$$

Among them, r_{ce} is the childcare expenditure rate, F_c is the general family's childcare expenditure, and $F_{\exp}$ is the general family expenditure.

From a social perspective, GDP and NDP are the most important outcomes.

$$GDP = \alpha * P * (1 - r_{un}) \tag{4}$$

Where α is the average productivity of the labor force, which is related to the creation of labor time and innovation activities, P is the total number, and r_{un} is the unemployment rate.

$$NDP = GDP - W_{\min} * P_{mww} - B_{cc} \tag{5}$$

Among them is the $w_{\min}$ minimum wage, p_{wmm} is the minimum wage worker, and B_{cc} is the annual conservation budget.

The current population education level (EDL) can be calculated by the following formula:

$$EDL = \left(\frac{Y_{ave,s}}{15} + \frac{Y_{\exp,s}}{18} \right) * 0.5 \tag{6}$$

Through the Analytic Hierarchy Process (AHP), we define two sets of weights when calculating the GDP index and the happiness index, respectively. Starting from the first criterion of the hierarchy (Table 1), we construct a comparison matrix using the comparison method of 1-9. Then, we attribute the weight of income factor, education factor and equality factor to happiness index, as shown in Table 2. By calculating the weights of the three factors in Level II, the maximum eigenvalue is 3.0044, and the consistency ratio CR = 0.0043, which is consistent with the consistency requirement of the analytic hierarchy process.

Adjust the comparison matrix according to the above steps until the consistency ratio CR ⩽ 0.1 of each matrix, we obtain two sets of weights. Finally, all the weights are shown in Table 2 and Table 3. They can be used to evaluate the Population Zero Index and the Happiness Index.

Table 1: Comparison matrix of happiness hierarchy I-II

Happiness	Income	Education	Equality	Weight
Income	1	2	1/5	0.247
Education	1/2	1	1/6	0.202
Equality	5	6	1	0.550

Table 2: Criteria weights of hierarchy I-II

Factor	GDP	Happiness
Income	0.462	0.299
Education	0.373	0.259
Equality	0.165	0.442

Table 3: Criteria weights of hierarchy II-III

Name	GDP	Happiness	Factor
Annual Family Expenditure	0.134	0.123	Income
Annual Family Income	0.145	0.107	Income
Minimum Wage	0.061	0.176	Income
Number of Minimum Wage Worker	0.155	0.083	Income
Personal Savings Rate	0.048	0.184	Income
Real Personal Income	0.397	0.142	Income
Weekly Working Hours	0.060	0.185	Income
Education Budget	0.399	0.462	Education
Education Development Level	0.601	0.538	Education
Childcare Budget	0.133	0.131	Equality
Ethnicity Ratio	0.129	0.173	Equality
Family Childcare Expenditures Rate	0.144	0.141	Equality
Gini Coefficient of Income Equality	0.252	0.252	Equality
Sex Ratio	0.127	0.214	Equality
Unemployment Rate	0.215	0.089	Equality

3. POPULATION ZERO: PUMS

To investigate the demographic characteristics of the underlying Population Zero, we extracted data from a PUMS database containing personal data for 1,618,489 individuals and performed data mining. Regarding the limitations of computing power, analyzing the entire data set is inconvenient and unnecessary. Instead, we randomly generated a sample of 10,000 immigrants. We assume that everyone has equal opportunities to be selected as members of the population.

In order to establish a peaceful, cooperative, and equal Utopia society: In 2100, we chose Population Zero according to certain criteria. We believe that an ideal society should be balanced and harmonious, which can be stipulated as follows, as shown in Figure 2:

(1) We define innovators as individuals under the age of 40 and have a bachelor degree or above. As Population Zero will migrate to a new and underdeveloped environment, innovation will be key to helping them adapt to the uncertainties and changes in the lives of Martians. Innovators should exceed

producers. We set the ratio of innovator to producer to 7:3.

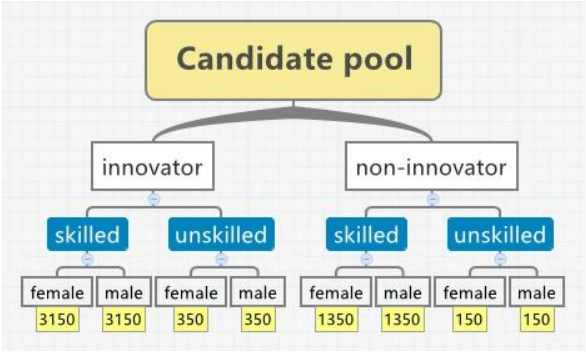

Figure 2 Selection criteria

(2) The construction of Martians requires a skilled workforce. We define "skilled labor" as individuals who work more than 35 hours a week. When choosing members, we have a strong preference for skilled labor, so we set the proportion of skilled workers to 9:1.

(3) In order to maximize the birth rate, we have determined the male to female ratio as 1:1.

(4) In order to ensure social stability, we require citizens to migrate with their spouses. If the spouse does not meet the conditions of the "Population Zero Program", citizens will not be selected and the child should be immigrated with the parents.

(5) Considering equality, the selection process is based on an unbiased policy that does not consider other individual differences such as race, characteristics and sexual orientation.

According to the standard, we classify the candidates and mark them as 4 different types, then select each type of specific number to join Population Zero. The categorizer and each type of number are specified in Figure 2.

After this procedure, we screen candidates whose spouses are not in the selected population and check if their spouse can replace another candidate. Otherwise, these candidates will be replaced.

To validate our selection criteria, we compared the random sample with Population Zero's demographics. We found that the advantages of Population Zero in terms of income, education and equality are obvious.

As shown in Figure 3 and Figure 4, the average annual revenue of "Population Zero" is higher, with a standard deviation of $46844.11, and a random sample of 52043.95. We believe that higher incomes and smaller income gaps can alleviate inequality and increase citizens' well-being.

As can be seen, the difference between the random sample and the Population Zero is small. Since the weekly hours of work are centered around 40 hours per week, we believe this standard is unnecessary.

Population Zero has a higher average level of education because we have a strong preference for innovators with a bachelor's degree or above.

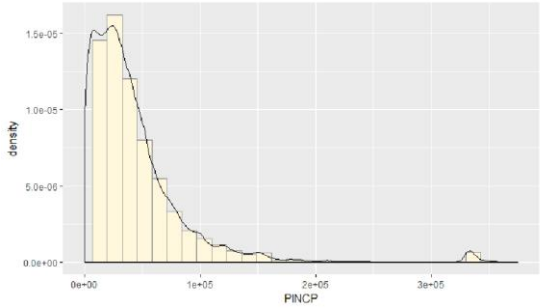

Figure 3 Random sampling: annual income distribution

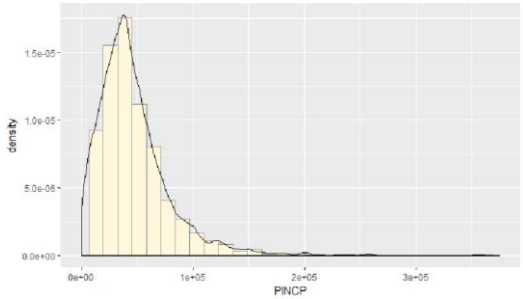

Figure 4 Population Zero: Annual Income Distribution

In terms of age distribution, we believe that the younger generation has strong innovation and replication capabilities, which will be very important for new Martian residents. Compared to random samples, Population Zero has significant advantages. In addition, the sex ratio is adjusted to the best 1:1 to maximize the birth rate.

We draw funnel plots and pyramid plots to analyze whether gender affects educational levels. We found that men generally have a higher degree of education, and the selected Population Zero has a smaller gender difference in education level, marriage is easier, and equality is improved.

4. EVOLUTIONARY MODELS AND DYNAMIC SYSTEMS

The dynamic model starts with the Population Zero data, and the evolutionary part provides a social environment for everyone. This evolutionary model is close to reality because it simulates many natural processes, including work, marriage, education, and so on.

"Population Zero" is now ready to build a brand-new city on Mars. Start their new life on Mars.

Our models and simulations are based on the following assumptions:

(1) Residents naturally die. There is ample food supply, no diseases and natural disasters, resulting in irregular deaths. The probability of death as a logical function of age is defined as $p = 1/(1+\exp(-0.15(x-70)))$.

(2) Every employed citizen has a tax obligation. According to the estimation method proposed by Blanchard et al. (2010), we set the unemployment rate to 5%.

(3) In order to ensure the well-being and equality of

society, we have designed a social security system that requires a minimum annual salary of $5,000. Social assistance funds are provided to non-workers.

(4) In our ideal situation, wealth is more fairly redistributed in society. We set the tax rate to 0.15, which is reasonable according to Maniquet and Neumann (2016).

(5) The effective operation of society requires an active workforce with a retirement age of around 65 years. Refer to the information provided by the National Academy of Social Sciences.

(6) Allow parental leave. Newborn parents can enjoy a $40,000 subsidy for a one-year holiday.

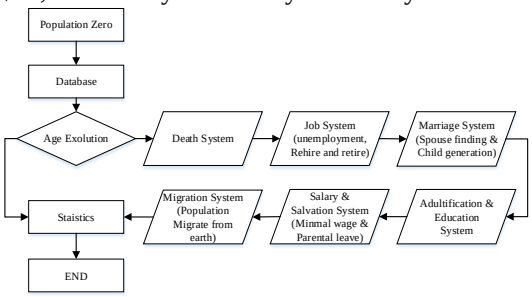

Figure 5 Dynamic simulation flow chart

Some believe that high education rates are critical for countries to achieve high levels of economic growth, as shown in Figure 5. Therefore, whether male or female, we allow everyone in our model to have equal access to education. However, where they will end their education depends on their personal experience. We use a normal distribution to describe the possibilities of completing education at different stages. The normal distribution is determined by the mean and standard deviation of last year's EDL (SCHL).

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Goodgrant Fund Optimal Investment Strategy based on K-means Algorithm

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Abstract: In order to improve the educational performance of undergraduates in the United States, this paper will determine the optimal investment strategy based on the Goodgrant Foundation's donation plan. Firstly, the K-means algorithm is used to cluster the initial candidate school data, and the distance between samples is calculated by the Euclidean distance method. The candidate schools are divided into three categories. Secondly, the principal component analysis method is used to comprehensively evaluate the school's educational performance. The number of students, the number of students, the proportion of scholarships and the graduates' index are used as indicator variables to evaluate the students' educational performance, and the variance contribution rate of the principal components is obtained. It is ω1=51.28%, ω2=3.88%, ω3=25.51%, ω4=14.35%, and ω5=4.78%. Finally, when calculating the return on investment, take the equilibrium coefficient α=0.5, calculate the overall ranking of the top 100 schools, and get the final investment amount and return on investment. The Goodgrant Fund's student performance value change period caused by scholarship investment is 4 years, and the top 10 schools in the overall ranking have a return on investment of more than 0.35.
Keywords: PAM algorithm; Principal component analysis; Data processing ; Return on investment

1. INTRODUCTION

The foundation's investment in American universities has a great significance for the improvement of university performance [1]. Cluster analysis [2-4] refers to the process of grouping a collection of physical or abstract objects into multiple classes consisting of similar objects. Its goal is to collect data on a similar basis to classify. From a statistical point of view, cluster analysis is a method of simplifying data through data modeling. Cluster analysis tools using k-means, k-center points and other algorithms have been added to many well-known statistical analysis software packages. Principal component analysis [5,6] is a basic mathematical analysis method. Its practical application is very extensive. It can recombine the original variables into a new set of independent variables that are independent of each other. At the same time, according to actual needs, several fewer comprehensive variables can be taken out from More information reflects the original variables. By combining cluster analysis with principal component analysis, the optimal strategy can be derived more accurately.

2. FUND OPTIMAL INVESTMENT STRATEGY MODEL

2.1 DATA CLUSTERING ANALYSIS

The data is filtered, and there are 5 types of complete data for clustering. The specific variables are shown in Table 1.

Table 1. Cluster Data Variable Table

	Variable	Show
1	pptug_ef	Proportion of part-time students
2	pctpell	Proportion of students receiving grants
3	ret_ft4	Repetition rates for four years in universities
4	pctfloan	Percentage of students receiving loans
5	gt_25k_p6	A ratio of twenty-five thousand yuan to six years of admission

Using the data information corresponding to the five variables in the above table, clustering analysis is conducted on 1354 candidate schools. The clustering result is shown in Figure 1.

Figure 1. Clustering results

As can be seen from the figure above, clustering schools are divided into three categories: category 1 is a private non-top-rated institution with a medium tuition fee and a small student size, and category 2 is a private top academy with a high acceptance rate, a low acceptance rate and a high graduation rate School,

category 3 is a public non-premier institution with low tuition, low graduation rate and large student size.

2.2 BASED ON THE PRINCIPAL COMPONENT ANALYSIS OF EDUCATION PERFORMANCE EVALUATION MODEL

2.2.1 Determination of Education Performance Evaluation Index

In order to quantify the student's educational performance, introduce a few definitions:

1) Performance Indicators: It is a measure of the quality of students in a school, that is, the quantitative indicators of student education performance. The size of the indicators determines the quality of student education. The larger the performance index, the better the education performance, and vice versa.

2) Performance Indicators: Variables are used to evaluate performance indicators. The performance indicators of each school can be obtained through a comprehensive evaluation of performance indicators.

3) Performance Contribution Variables: It means that according to the situation and orientation of investment, we can select the appropriate variables to predict the change of performance indicators with the amount of donations according to the data of variables in the data table, namely, the change of donation quantity indirectly influences the performance through the variable of performance contribution index.

In fact, the core of the Foundation's concern is the enrollment rate and enrollment rate, on this basis, consider the performance indicators of this article is mainly used to assess the quality of student training in a school, so select the number of students, part-time students, scholarships Scale and graduates 'indicators as indicator variables to evaluate students' educational performance. The variables in the data table corresponding to these indicators are shown in the following Table 2.

Table 2. Performance Indicators variable table

	Variable	Index
1	UGDS	Total number of students in schools
2	PPTUG_EF	Proportion of part-time students
3	PCTPELL	Proportion of students receiving grants
4	RET_FT4	Repetition rates for four years in universities
5	gt_25k_p6	A ratio of twenty-five thousand yuan to six years of admission

2.2.2 Performance Indicators Rankings Identified

Use the data in the data table to carry on the principal component analysis to the variable listed in Table2, use the y1, y2, y3, y4, y5 respectively to represent the above five variables, the steps are:

1) Using the standardized data, we calculated the correlation coefficient matrix R = (r_{ij}) $5_{\times 5}$ of these five variables.

$$r_{ij}=\frac{\sum_{k=1}^{n}(y_{ki}-\overline{y_i})(y_{kj}-\overline{y_j})}{\sqrt{\sum_{k=1}^{n}(y_{ki}-\overline{y_i})^2\sum_{k=1}^{n}(y_{kj}-\overline{y_j})^2}} \quad (1)$$

Among them, $\overline{y_i}$ is the mean of $y_{ki}(k=1,2,\cdots,n)$;

2) Calculate the eigenvalues of the correlation coefficient matrix, from small to large

λ1=0.5128, λ2=0.0588, λ3=0.2351, λ4=0.1235, λ5=0.0678

3) Calculate the variance contribution rate of each principal component, from

$$\omega_i=\frac{\lambda_i}{\sum_{i=1}^{5}\lambda_i} \quad (2)$$

Available, ω_1=51.28%, ω_2=3.88%, ω_3=25.51%, ω_4=14.35%, ω_5=4.78%。

The calculation shows that the variance contribution rate of the first, third and fourth principal components has exceeded 90%, and the three principal components can be used for comprehensive evaluation.

4) For $\lambda_j(j=1,2,3)$, solve the system of equations $R\mu=\lambda_j\mu$, and obtain the unit eigenvector μ_j, then the formula for obtaining the three principal components is:

$$\begin{cases} z_1=\mu_{11}y_1+\mu_{12}y_2+\mu_{13}y_3+\mu_{14}y_4+\mu_{15}y_5 \\ z_2=\mu_{21}y_1+\mu_{22}y_2+\mu_{23}y_3+\mu_{24}y_4+\mu_{25}y_5 \\ z_1=\mu_{31}y_1+\mu_{32}y_2+\mu_{33}y_3+\mu_{34}y_4+\mu_{35}y_5 \end{cases} \quad (3)$$

Among them, z_1, z_2, z_3 respectively represent these three main components, the corresponding coefficients are respectively:

$$\begin{aligned} \mu_1&=(-0.62018,-0.47399,0.12210,0.57341,0.11832) \\ \mu_2&=(-0.11579,0.67925,-0.18962,0.55301,0.10118) \\ \mu_3&=(0.78302,-0.24881,-0.00379,0.60521,0.11305) \end{aligned} \quad (4)$$

4) Weighted sum of the three principal components, the weight of each principal component of the variance contribution rate, you can get the comprehensive evaluation value:

$$Y=\sum_{i=1}^{3}\omega_i z_i \quad (5)$$

According to the above formula, we can get the performance index value of 2650 schools, the following Table 3 lists the top 10 schools of performance value.

As can be seen from the table, the top ten schools in the performance rankings are all located between 13 and 40 in the overall ranking.

Table 3. Performance Indicators Top 10 Schools.

UNITID	School Name(INSTNM)	Value

133951	Florida International University	1.38085
228723	Texas A & M University-College Station	1.19802
132903	University of Central Florida	1.17500
214777	Pennsylvania State University-Main Campus	1.11903
171100	Michigan State University	1.08965
135717	Miami Dade College	1.07831
186380	Rutgers University-New Brunswick	1.05811
236939	Washington State University	1.03654
122755	San Jose State University	1.01321
132709	Broward College	0.99873

2.3 THE OPTIMAL INVESTMENT STRATEGY BASED ON RETURN ON INVESTMENT

2.3.1 Roi Calculation

Assuming the i-th school accepts donations as Xi, the number of new students enrolled in the year as UNi, which can be obtained by dividing the UGDS variable in the datasheet by 2 or 4 respectively (school year system), the percentage of students receiving scholarships is:

$$\begin{cases} RA_i = \dfrac{AN_i}{UN_i} \\ AN_i = \dfrac{X_i}{50000} \end{cases} \quad (6)$$

Among them, ANi is the number of scholarships received for the ith school. Given that the percentage of students who receive scholarships influences all the indicators used to measure school performance, assuming the impact of the percentage of students receiving scholarships on these indicators is equivalent, the ROI for each school can be expressed as:

$$ROI_i = \beta * RA_i * Y_i = \beta * \frac{AN_i}{UN_i} * Y_i = \beta * \frac{X_i}{UN_i * 50000} * Y_i \quad (7)$$

Among them, β represents a coefficient of performance increase after a student obtains a scholarship. From the above formula, when β is between 0 and 0.5, the difference between the ROI of each school is between ($0.05Y_i$, $0.5\ Y_i$), and then calculated by the formula, based on the rate of return multiplied by an equalization coefficient between 0-1, the difference is smaller, so the result is not sensitive to the parameters. Here β = 0.25, students receive a scholarship after learning performance improved by 25%.

2.3.2 The Optimal Investment Strategy

According to the ROI formula, calculate the return on investment of the top 100 schools with the same amount of donations. To balance the role of ROI and performance in the final decision, the following formulas are used to calculate the ranking of these 100 schools:

$$F_i = \alpha ROI_i + (1-\alpha)Y_i, i = 1,2,\cdots,100 \quad (8)$$

Among them, $a \in (0, 1)$ is the equalization coefficient, and choose α = 0.5.

In order to enhance the performance of the value of the return on investment in the role of the number of students of different levels of schools, calculate the integrated ranking value in accordance with the following formula to select the i-th school investment X_i:

$$0.1 \le \frac{X_i}{50000 * UN_i} \le 1 \quad (9)$$

According to the above formula, combined with the data in the data table, when the number of students is between: 8000-80000, the calculation of Fi is desirably Xi = 100 million USD. And so on, the results in Table 4.

Table 4. Investment schools, donations and return on investment rate table

UNITID	School Name	Investment amount / $10, 000	ROI%
171100	Michigan State University	921	0.57
228723	Texas A & M University-College Station	936	0.56
227182	Lone Star College System	1024	0.56
132903	University of Central Florida	976	0.52
186380	Rutgers University-New Brunswick	981	0.49
104151	Arizona State University-Tempe	1033	0.48
214777	Pennsylvania State University-Main Campus	1025	0.40
232557	Liberty University	916	0.38
150987	Ivy Tech Community College	938	0.37
135717	Miami Dade College	985	0.33

As can be seen from the above table, the return on investment of schools is relatively high.

3. RESULTS AND DISCUSSION

Data preprocessing. The resulting 1364 schools, the use of PAM algorithm for clustering information of the data to be three types of schools. According to the results of the clustering, five kinds of indicators are selected, and the principal component analysis of the 1364 schools' information is conducted. The sum of the variance contribution rate of the first three types of principal components is more than 90%. The first three categories of principal components are used to calculate the performance index to get the school performance Value ranking, after the United States in

2018 with the overall rankings for comparison, the performance ranking of the top ten schools are all ranked in the overall ranking of 13 to 40, you can determine the principal component analysis of the performance indicators are more reasonable and accurate.

4. CONCLUSIONS

In this paper, the K-means algorithm and the Euclidean distance method are used to classify schools into three categories: private non-top institutions with medium tuition fees and small student scales, private top schools with high fees, low admission rates and high graduation rates. Schools, public non-top schools with low tuition fees, low graduation rates, and large student sizes. Then the principal component analysis method is used to comprehensively evaluate the school's educational performance, and the variance contribution rate is obtained: ω1=51.28%, ω2=3.88%, ω3=25.51%, ω4=14.35%, ω5=4.78%. Finally, when calculating the return on investment, the overall ranking of the top 100 schools is calculated, and the final investment amount and return on investment are obtained. The Goodgrant Fund's student performance value change period caused by scholarship investment is 4 years, and the top 10 schools in the overall ranking have a return on investment of more than 0.35.

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The Organization and Establishment of Specialty Discipline for Railway Police

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Abstract: The organization and establishment of railway police specialty discipline are the basis of railway police work and team development. This paper expounds the guiding ideology of the establishment of Railway Police Specialty Discipline in the new era, and analyses the influencing factors of the establishment of railway police discipline, then puts forward the method for establishing railway police discipline specialty, which provides an important reference for the railway police characteristic discipline specialty.
Keywords: railway police, discipline establishment, training, police Technology

Railway is the main power transmission system between Chinese cities and the basis for ensuring the vitality of national security and social development. The safe operation of railways is of great significance for safeguarding national security, social development, people's livelihood and social stability.

By the end of 2018, the national railway operation mileage reached more than 131,000 kilometers, of which high-speed rail was more than 29,000 kilometers. In 2018, the national railway completed 3.37 billion passengers and completed the delivery of goods of 4.022 billion tons, forming the world's most modern railway network and the most developed high-speed rail network; successfully built a high-speed, universal speed with completely independent intellectual property rights. Reloading the railway technical standards system in the three major fields, the overall technical level has entered the world's advanced ranks, and some of them have reached the world's leading level. The breadth and depth of the railway opening up has been continuously expanded, and the international influence and competitiveness of China's railways have significantly improved.

In recent years, China's railway establishment has developed rapidly. With the rapid increase of operating mileage, the continuous expansion of the scale of the network, the continuous improvement of the level of operational intelligence, the increasing intensity of passenger flow, and the profound changes in the domestic and international security situation, security issues have become increasingly Hotspots of social concern.

The Railway Police College is directly affiliated to the Ministry of Public Security and the only institution in China that trains railway public security professionals. Now this college is fully promoting transformational development and characteristic development, building railway policing, railway policing, waters policing [1], airspace. policing [2], traffic management engineering, anti-smuggling police, which is called six majors for the completion of the Transportation Police Academy [3]. The purpose of this paper is to explore the path of building a railway police discipline with distinctive characteristics, rich connotations, solid foundation and sustainable development.

1. THE GUIDING IDEOLOGY OF THE BUILDING THE POLICE HIGHER EDUCATION MAJORS IN THE NEW ERA

Public security higher education training is on the leading, basic and strategic position in the entire public security work and public security team. With the deepening of the reform of the recruitment system for public security professionals in public security colleges and the classification development and transformation and upgrading of public security colleges, public security higher education needs to actively promote transformation and development, and effectively enhance the ability to serve economic and social development.

Public security higher education has obvious industry specificity in higher education. It is the fundamental task of public security higher education to cultivate public security professionals with good professional quality, development potential and scientific spirit in the new era. It emphasizes that public security colleges should meet the needs of economic establishment and public security work, and require public security institutions to do their own work. The characteristics of "public security" must be characterized by "police".

In the establishment of railway police specialty disciplines, we must fully consider the special needs of the specific industry for the quality and ability of police personnel, and co-ordinate the new challenges of the development of modern science and technology on the professional capabilities of police personnel, adhere to the actual combat-oriented, based on actual combat, practical combat, Cultivate talents for railway security police positions [4].

2. FACTORS AFFECTING THE ESTABLISHMENT OF RAILWAY POLICE DISCIPLINES

Railway police personnel are on special positions, and their ability requirements are relatively unique

[5]. There are many factors affecting the public safety of railways, such as the fixed line, the displacement of the area, the narrow space, the complex environment, the dense crowd, which are the inherent characteristics of the system. There are many unpredictable security risks. Railway police often need to face special problems such as crowded people, inconvenient movements, close contact with criminal suspects, and special issues for police officers' awareness, investigation, arrest, detonation, prevention and supervision, and emergency response. Claim. Railway police officers need to constantly cross-regional operations, with higher individual combat capability and cross-regional cooperation capabilities.

Modern police technology will inevitably lead to the modern police revolution, and the police personnel who fully control the new technology will surely control the future of the police revolution. The rapid development of police technology requires the police talents of the new era to have the qualities and capabilities to control new technologies and lead the development of new technologies. The railway station has closed space, relatively open, narrow passage and complex environment, which provides a good soil for the deep application of new security technology equipment in the scene. The establishment of intelligent police services provides a guarantee for the improvement of the combat effectiveness of public security organs and the efficient use of police forces.

The establishment of special disciplines for railway police affairs in the new era should fully consider the impact of high-tech advances such as Internet of Things, big data, cloud computing, etc. on the establishment of the three-dimensional security system of the railway and the operation mechanism of the police, and adopt the idea of combining the two departments and the academic system. We will continue to strengthen the establishment of intrinsic characteristics, carry out research and development of relevant knowledge modules and courses such as big data policing, smart public security, intelligent security inspection, video patrol control, and cultivate high-quality applied police personnel in the new era.

There is a need for actual combat and a professional should be. From the perspective of cultivating high-quality police professionals, the establishment of railway disciplines should be oriented to actual combat, from curriculum setting, teaching links, teaching methods and allocation of teaching resources, to comprehensively optimize professionalism, professional ability and police skills training. In the whole process of personnel training, we will strive to create a talent training system that integrates teaching, training, and research.

3. THOUGHTS ON THE ESTABLISHMENT OF RAILWAY POLICE DISCIPLINES

Disciplinary establishment is the basis of professional establishment. Establishing the discipline theory and constructing the discipline system is the basis and starting point of professional establishment. The establishment of railway police specialty disciplines should actively explore the basic theories and research objects unique to the railway police discipline, actively revitalize the stocks, make good use of the existing achievements, and actively make excellent increments to foster new discipline growth points.

3.1basic elements and relationships of disciplines

The establishment of disciplines is an organic whole consisting of five elements: “goal, content, establishment strategy, guarantee and management evaluation”. The goal plays a guiding and driving role in the establishment of disciplines. Content is a collection of content presented through a reasonable structural configuration under the direction of the target. The establishment strategy is to solidify and standardize the functions through rational allocation of constituent elements under the guidance of the objectives. Security is the hardware facilities, technical equipment and personnel provided for the implementation of discipline establishment, which is the basis for development and innovation. Management and evaluation play a role in information feedback and regulation.

3.2 Multi-dimensional integration of teaching and research team establishment

The professional teaching team of the public security colleges and the disciplinary research team are integrated to ensure the timeliness of the application of the latest academic results. Facing the new development of disciplines and new applications of police technology, expanding the “friend circle” of running schools, focusing on the integration of full-time teachers in schools, railway police practical experts, researchers in research institutes and the “four forces” of the backbone of operating enterprises, Emphasis is placed on the absorption of public security combat instructors and the "double-skilled dual-energy" teachers with applied research background to participate in the research of subject professional establishment, and to create a "community" for the discipline establishment of multi-dimensional resources.

3.3Multi-dimensional education resource integration

Practice has proved that it is more difficult for a single classroom teaching to train high-quality applied police professionals. The railway police profession adheres to the five progressive talent training modes of “basic quality education, professional foundation training, professional ability enhancement, practical simulation teaching and police service internship”, and moves the classroom to the experimental training ground and the police to the actual battle. Move to the production site of the enterprise, adhere to the theoretical classroom, simulation exercises, practical internships, and

science and technology deductions. Focus on the basic policing quality, with the characteristics of the policing skills as the core, covering social adaptability, self-improvement ability, and innovative practice. The ability and scientific thinking ability is the content of the railway police professional discipline establishment.

3.4 actively promote the open sharing of railway police resources based on discipline establishment

Railway policing is a field of scientific research on comprehensive management of social security. It is necessary to clarify the logical starting point and research object of research in this subject area. "Risk management and control" and "station service" are the theoretical foundations. The logical starting point of disciplinary research is "railway safety" and "Safety and Security", the main research object is the railway security main body, security activities and countermeasures. Cooperate with 18 railway public security bureaus to build an open sharing platform for police resources such as risk research and judgment, hidden danger inspection, terrorism prevention, public security prevention and control, and emergency management.

4. CONCLUSIONS

The establishment of the disciplines of railway police specialty should be guided by the guiding ideology of the establishment of higher education disciplines in the new era, adapt to the needs of economic establishment and public security work development, fully consider the special needs of the railway industry for the quality of police personnel, and coordinate modern science and technology to develop new challenges to the professional competence of police professionals, to study the main body of railway security, the rules and countermeasures of security activities. We should focus on the integration of full-time teachers, railway police practical experts, researchers in research institutes, and the experts in enterprises who are “four forces”, in order to strengthen the high-quality application-type police characteristics talents, actively promote the open sharing of railway police resources, and comprehensively establish the characteristics of railway police professional disciplines.

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Research on Multi-level Housing Planning System in Xiongan New District

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Abstract: Hundred-year plan, Xiongan New District. Xiongan New Area is situated inland, which marks the real start of China's growth. Housing construction in Xiongan New District should fully implement the concept that "houses are used for living, not for speculation". Based on the analysis of the current situation of Xiongan New Area, this paper studies its positioning as the carrier of Beijing's non-capital function and the new economic growth pole in Beijing, Tianjin and Hebei. Combining with the planning and construction objectives of Xiongan New Area, this paper puts forward suggestions on the construction model of multi-level housing supply system in Xiongan New Area.
Key words: Xiongan New District; Rent and Sale simultaneously; Public Rent Housing; Multi-level Housing Supply System

1. PRESENT SITUATION OF XIONGAN NEW AREA

1.1 SUPERIOR GEOGRAPHICAL POSITION

Xiongan New Area is in the hinterland of Beijing, Tianjin and Baoding. It has obvious advantages in location, abundant development space and basic conditions for high starting point and high standard development and construction [1]. The starting area is 100 square kilometers, the medium-term development is 200 square kilometers, and the long-term control area is 2000 square kilometers (Beijing is 16800 square kilometers, the built area is 2900 square kilometers). The planning area of Xiongan New Area is large, and the existing development level is low [2].

1.2 POPULATION SIZE

After the establishment of Xiongan New District, the new population has increased significantly. From April 1 to April 20, more than 220, 000 new people poured into Xiongan in just 20 days, equivalent to 11, 000 more people per day, according to the data. As shown in Figure 1, the new population has increased exponentially in a wavy way since the New Deal was issued a month ago, especially during weekends and holidays, with the inflow peaking.

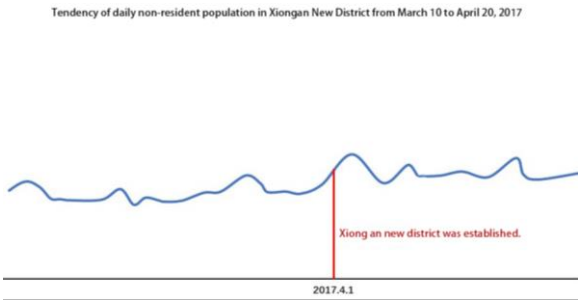

Figure 1: Change Trend of Daily Non-resident Population in Xiong'an New District, 2017.3.10-4.20

1.3 ANALYSIS OF ADVANTAGES AND DISADVANTAGES

With the better and better development of Beijing, the economy has also developed rapidly, attracting many people from other places to seek work and development in Beijing, resulting in rapid population growth, serious traffic congestion and other issues, and Beijing's environmental governance issues are also urgent. Beijing bears too many functions that are not supposed to be carried by the capital. However, Beijing's own resources are limited and its geographical space is limited, so it cannot rely on itself to solve the problem. An important goal of setting up Xiongan New Area is to alleviate Beijing's non-capital functions and alleviate Beijing's "metropolitan disease". The establishment of Xiongan New Area can accelerate the pace of coordinated development between Beijing, Tianjin and Hebei, and solve the current problems by relying on the development strategy of Beijing, Tianjin and Hebei. Through actual investigation, it is found that Xiongan New Area is dominated by plains and waters, with vast geographical area and abundant land resources. Located at the end of Jiuhe River, it has the largest freshwater lake in North China, providing a broad space for population, industry and education layout.

But there are also some difficulties and obstacles in Xiongan's regional economic cooperation. The existing industrial chain in Xiongan New Area is incomplete and incomplete [3]. The marketization of Xiongan New Area is low, and the "core power" of economic development is not enough. There is a big gap between Beijing and Tianjin in industrial transfer gradient. For example, Beijing and Tianjin are two cities with fast development of various industries and high industrial positioning. Although Xiongan is close to Beijing and Tianjin, its industrial positioning is

very low, which cannot effectively stimulate the economy. Moreover, because of the large drop in the transfer gradient of its industries, it is difficult to form a balance in a short period of time. Linking up the industrial chain.

3. LOCATION OF XIONGAN NEW AREA

The orientation and development of Xiongan New Area can be elaborated from the following aspects.

3.1 AS THE BEARING PLACE OF BEIJING'S NON-CAPITAL FUNCTION

The main orientation of Xiongan New Area is to relieve Beijing's non-capital functions. The Outline of Beijing-Tianjin-Hebei Cooperative Development Planning clearly points out that the core of Beijing-Tianjin-Hebei Cooperative Development Strategy is to relieve Beijing's non-capital functions in an orderly way. With the increase of Beijing's population, frequent haze, traffic congestion, high housing prices. Relevant well-known high-tech industries in Beijing, such as low pollution and low consumption industries, regional logistics bases, education, medical treatment and training institutions, will move to Xiongan to realize the maximum transfer of Beijing's non-capital functions.

3.2 AS A NEW ECONOMIC GROWTH POLE IN BEIJING-TIANJIN-HEBEI REGION

According to the growth pole theory, it is only an ideal for a country to achieve balanced development. It is impossible for a country to achieve balanced development. Economic growth is usually transmitted from one or more "growth centers" to other sectors or regions gradually. Therefore, we should choose a specific geographical space as the growth pole to promote economic development. Under the background of the coordinated development of Beijing, Tianjin and Hebei, the first thing that comes to mind is the extreme imbalance of economic development among the three places. As a new economic growth pole in Beijing-Tianjin-Hebei region, the construction of Xiongan New Area will play a new role in economic growth pole in terms of geographic space and potential development advantages.

The establishment of Xiongan New Area has important demonstration significance. For Hebei Province, through the innovative planning and construction of Xiongan New Area, it will play a very important benchmark role in the construction and development of other areas in the province, including the urban development planning and construction management, the cultivation and development of high-tech industries, the innovation of science and technology, opening, the introduction of high-quality talents, and the construction of ecological environment. Providing demonstration and leading role for Hebei province and even other provinces and regions in system and mechanism reform.

3.3 AS A NEW DRIVING FORCE OF ECONOMIC DEVELOPMENT IN HEBEI PROVINCE

From the current situation, no matter the construction of public service facilities, per capita consumption level and the overall level of social civilization, there is a great gap between Hebei, Beijing and Tianjin in the level of development. The construction and development of Xiongan New Area and the gathering of many high-tech enterprises and high-level universities will push the economic development of Hebei Province to a new level. Looking forward to the future, the gap between Hebei, Beijing and Tianjin will be significantly narrowed, and the coordinated development situation between Beijing, Tianjin and Hebei will be significantly improved, showing a new pattern of benign interaction, deep integration and common development.

4. MULTI-LEVEL HOUSING SUPPLY SYSTEM IN XIONGAN NEW DISTRICT

Xiongan New Area should adhere to the orientation of "houses are for living, not for speculation", and speed up the establishment of a housing system featuring multi-subject supply, multi-channel security and simultaneous rent and purchase. As an important part of the government's basic public services, housing security is an important measure to improve people's livelihood and promote social fairness [4]. At the early stage of the new district, the housing demand of new citizens and immigrants is large, and good planning will also boost housing demand. The proportion of affordable housing should be larger, but low-rent housing and public rental housing should be the main ones to meet the basic needs, to prevent the "welfare trap" [5].

At the same time, we should also control the scale of commercial housing development to maintain a low-cost environment for living and starting businesses. In the middle and late stages of the construction of the new district, all the plans basically "landed", the housing demand and the marginal decrease of new development space, and the commercial housing will gradually occupy a larger proportion. Vigorously develop rental housing, giving priority to housing by leasing; introducing common property rights housing, reducing the threshold for middle-income families to buy houses; orderly development of commercial housing to meet the housing needs of groups above middle and high income. The government has led the development and construction of commercial housing land, set up platform companies to develop and operate at low cost and low profit, and cultivate and guide the healthy development of the commercial housing market. At the same time, we should learn from the practices of real estate regulation in first-tier cities to ensure the stability of the market in Xiongan New Area and strive to achieve a better living and living conditions for the people in Xiongan New Area. Firstly, we should vigorously develop rental housing, giving priority to the realization of housing by leasing [6,7]. The housing problem of low-income groups

should be solved by providing public rental housing mainly by the government. Define the criteria for low-income groups, including the level of annual household income, per capita living space and other conditions, under the standard line should be insured and fully protected. To establish a strict withdrawal mechanism, those who no longer meet the requirements should withdraw in time to solve the housing problem through market-oriented. The closed management of public rental housing supply will not be promoted to the market for rent or sale in the future. The location of public rental housing should be arranged in areas with perfect municipal infrastructure, sound supporting living service facilities and convenient urban public transport. Public rental housing should be a complete set of housing, with a flat area of no more than 80 square meters. The rent of public rental housing should be significantly lower than that of market-oriented rent, and rent subsidies should be implemented according to the different conditions of the protected families. The standard or proportion of subsidies should be determined in different grades. The monthly rent paid by the protected families should not be higher than 40% of the monthly expenditure of the families. The housing problem of new citizen groups can be solved by market-oriented rental housing. Groups include young workers who do not yet have the housing conditions, double-venture workers, University graduates, new entrants to the Xiongan New District, enterprises and institutions, and other new citizens, as well as low-income families who do not meet the housing security conditions. To vigorously develop market-oriented rental housing, we should not only activate the existing stock of housing for rent, maximize housing utilization, standardize housing rental intermediary services in the intermediary industry, stabilize rental relations, and stabilize rental level, but also vigorously support the development of housing rental enterprises through centralized acquisition, management and operation on behalf of others. To provide standardized, large-scale and long-term rental housing, rapidly cultivate and expand the housing rental market to meet the rental needs of many new citizens.

Second, the introduction of joint property rights housing, reduce the purchase threshold of middle-income families. Middle-income groups, especially the "sandwich layer" housing problem, can be solved through the common property rights housing. The government has formulated a housing policy with common property rights, defined the criteria for purchasing houses with common property rights, allowed government designated institutions, real estate associations, housing cooperatives or other social institutions to purchase houses with common property rights, and lowered the threshold of purchasing houses. According to such factors as the price level of the house with common property rights and the affordability of the home buyers, the share of the house property rights of 50%, 60%, 70% or 80% of the home buyers is determined, and the rest is purchased and held by the institutions. Shared property rights housing should be managed in a closed manner. The share of property rights held by institutions and families can only be sold to other record-keeping institutions or other families that meet the conditions of purchasing the housing with common property rights. The condominium area of common property right housing in urban area should not exceed 90 square meters, and the suburban area should be relaxed to no more than 120 square meters.

Third, orderly development of commercial housing to meet the housing needs of groups above middle and high income. The housing problems of middle- and high-income groups and above should be solved through complete marketization. These groups have strong ability to pay for house purchases, strong willingness to improve housing, high efficiency and sustainability through market-oriented solutions, which is also in line with the direction of deepening the reform of housing system in China. We should grasp the relationship between supply and demand of commodity housing for a long time to prevent the rapid rise of land prices and house prices at different stages, thus impacting the ability of these groups to buy houses and avoiding the emergence of new "sandwich layer" groups.

5. CONCLUSION

In order to build a new era of "smart new city" in Xiongan New Area, the introduction, retention and development of talents are the key points of the construction and development of the new area. Talents and science and technology will be the driving force of the vigorous and rapid development of the new area. This form of building public housing through the joint efforts of the government and social capital not only provides a new way of thinking for the promotion and development of the new housing rental mode, but also meets the needs of various consumer groups, does not follow the old road of urban development led by real estate, and creates a good job for all kinds of talents working in Xiongan New Area. As a living environment, it also provides a good support for the green rise of "Wisdom New Town" in Xiongan New Area.

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High School Services and Local Related Industries-Taking the Cultivation of Cross-Border E-Commerce Talents in Zhaoqing University as an Example

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Abstract: The basic functions of the university include: teaching and research, talent training, and serving the society. With the rise of Guangdong, Hong Kong and Macao bay area into a national strategy and the opening of the Hong kong-zhuhai-macao bridge, Zhaoqing, as an important city in the region, plays an immeasurable role. As the leading undergraduate college in Zhaoqing city, Zhaoqing college has been paying more and more attention to the way and ability of serving the society. Starting from the current situation of local undergraduate colleges serving the society, this paper analyzes the problems existing in the process of docking with relevant industries, and then puts forward the adaptive countermeasures of cross-border e-commerce talent cultivation and local economic development.
Keywords: local colleges and universities; Serving the community; Cross-border electricity

1. INTRODUCTION

In recent years, more and more attention has been paid to the quality of talent cultivation in colleges and universities, the adaptability of economic development and the ability of local colleges and universities to serve the society. The outline of the national medium - and long-term education reform and development plan (2010-2020) clearly puts forward that “colleges and universities should firmly establish the consciousness of actively serving the society and carry out all-round services” [1-3]. Guangdong province, which is in the forefront of the national economic development, pays more attention to the social service ability of colleges and universities as an important index for the construction of provincial model schools and the acceptance of first-class schools. In 2017, Guangdong, Hong Kong and Macao bay area were officially upgraded to a national strategy [4-6]; In 2018, the Hong Kong - Zhuhai - Macau bridge was officially passed. All these indicate that Guangdong, Hong Kong and Macao bay area will have a rapid development in the next few years. With the implementation of “One Belt and One Road” strategy and the development of “Internet + foreign trade”, the industry has an urgent need for cross-border e-commerce [7]. Zhaoqing, as an important city in the bay area, has put forward the agenda of cultivating cross-border e-commerce talents and adapting to the economic development of the bay area.

2. CURRENT SITUATION OF LOCAL COLLEGES AND UNIVERSITIES SERVING THE SOCIETY

Some scholars put forward that the social service function should be emphasized according to the university's own category, scale, resources and development stage. Local colleges and universities should not only train application-oriented and interdisciplinary talents with certain theoretical level for regional economy, but also provide academic, technical and service support for regional social and economic development. Local colleges and universities have made a lot of explorations in performing social service functions, such as the way to realize social service, service mode and cooperation mechanism. Although local colleges and universities have made remarkable achievements in social service in recent years, the overall level is still not high, and there are problems such as lack of awareness of social service, one-sided understanding of social service, generalization of social service functions and lack of social service mechanism.

2.1 TRADITIONAL CULTIVATION MODE IS FACED WITH DIFFICULTIES

(1) Curriculum is relatively new and teachers and teaching resources are scarce

Cross-border e-commerce is an emerging cross-discipline, with rapid theoretical development and platform rules. Many colleges and universities have opened courses related to cross-border e-commerce, international business, international trade, business English and other majors in the past three years, transforming the training direction of cross-border e-commerce talents. The novelty of cross-border e-commerce determines that its teachers are all “dry middle schools”. Some teachers will study in industrial enterprises during holidays to improve their practical skills. Some teachers stay in the “armchair strategist”. In addition, the improvement of the threshold of the platform makes it no longer convenient to lead students to teach on the real platform.

(2) Teaching methods cannot keep pace with The Times and cannot mobilize the learning interest of post-90s students

Now the teaching objects are 100% of the post-90s generation. The growth environment of this generation is quite different from that of previous students, and they are more expressive and innovative. Although in recent years, we have been advocating student-centered and student-centered teaching reform. Flipped classes, moods and micro classes are also being tried, but they are not widely used. Only some courses are being implemented, but have not yet been thoroughly implemented.

(3) Limitation of the box makes the assessment method relatively simple, which is not conducive to the cultivation of students' ability

Public undergraduate colleges and universities are subject to the constraints of talent training programs, and once the examination and assessment methods are determined, it is difficult to adjust them. Cross-border e-commerce is a course that focuses on both theory and practice. Most students can master the knowledge and skills of cross-border e-commerce in class, but there is still a gap in how to turn the teaching effect of this class into actual productivity.

2.2 CROSS-BORDER E-COMMERCE STUDIO MODE— BASED ON INDUSTRY-UNIVERSITY-RESEARCH COLLABORATIVE INNOVATION

Establish a cross-border e-commerce studio, select outstanding students from international trade, municipal business, e-commerce and other related majors, build a team, set up the “cross-border e-commerce elite class”, under the guidance of enterprise mentors and teachers, introduce enterprises into the studio, and the student team operates the real account of the enterprise. On the one hand, it can solve the problem of weak practical links of teachers. On the other hand, students can learn more practical knowledge through the real platform operation and quickly adapt to the role change before the post. At the same time, when the operation effect is good, students can also get the commission income and internship salary provided by the enterprise. It not only improves students' learning interest and motivation, but also enables them to see the actual transformation effect. The assessment can also be combined with the assessment standards of each student's position in the team to evaluate the learning effect more accurately. Enterprises bring projects into the studio, and the process of teachers and students doing real projects together is not only a learning process, but also a process of gradually seeing the results, to accumulate practical experience for course learning.

The cross-border e-commerce studio takes enterprise mentors and cross-border full-time teachers on campus as the instructors, introduces enterprise projects, and through AliExpress, amazon, Wish and other platforms, teachers and students jointly help enterprises to build stores, promote and operate, and promote local featured goods overseas. The cultivation mode of cross-border e-commerce studios not only improves students' employment competitiveness, but also expands new markets for local characteristic industries, indirectly improves the school's brand awareness, and achieves a win-win situation among the three parties.

3. CROSS-BORDER E-COMMERCE STUDIOS

3.1 STUDIO PROJECT SOURCE

(1) Double division undertakes enterprise projects. The enterprise mentor has rich practical experience in cross-border operation, and on behalf of Alibaba’s official travel to all parts of the country to train enterprise personnel, many enterprises find them to cooperate in cross-border e-commerce agent operation projects. Through the joint efforts of teachers on and off campus, we can undertake some high-quality some projects.

(2) There is a strong demand for cross-border e-commerce talents of traditional manufacturing enterprises in Zhaoqing, which makes it very difficult for enterprises to recruit suitable talents. Some enterprises come to the school in advance to reserve talents or cooperate with enterprises through school-enterprise cooperation. For example, by recruiting students for internships, alumni seek cooperation with teachers on campus, and expand overseas markets through cross-border platforms.

(3) Students who have the advantage of supply of goods start their own businesses. According to the survey, many students in chaoshan and shenzhen, as well as those in dongguan have enterprises in their families. Family businesses have their own overseas markets and are also looking for operation teams. Such students have a better starting point for settling in cross-border e-commerce studios, which is more stimulating, exemplary and influential.

3.2 STUDIO SECURITY SYSTEM

(1) Technical support

External instructors should have rich cross-border practical experience. They should be the official lecturers or big sellers of AliExpress university. As the operational instructors, they should help the studio solve specific operational problems.

(2) Management guarantee

Full-time teachers in the university are responsible for the daily operation of the team, negotiation of enterprise projects and team management, and the establishment of a team according to the enterprise projects to ensure the implementation of the enterprise projects.

(3) Operation guarantee

The division of labor of the student team is clear. Students A and B are responsible for store operation and promotion, student C is responsible for customer service and finance, and student D is responsible for art work. After the development of the studio,

members will be selected according to the enterprise project, and similar teams will be established to replicate the management mode.

3.3 STUDIO FEATURES

(1) Serve local small, medium and micro manufacturing enterprises

The target enterprises for cooperation are mainly small, medium and micro-sized enterprises. Firstly, local traditional manufacturing industry is selected. According to relevant data, most large companies have their own professional e-commerce teams with mature technologies and abundant funds. However, small, medium-sized and micro-sized enterprises are facing fierce domestic competition and are in urgent need of expanding overseas markets. However, they are short of relevant talents and resources and capital, so cooperation with small, medium-sized and micro-sized enterprises can complement each other. Among the numerous small, medium and micro enterprises, there are also requirements for the selected enterprises. The quality of the products of the enterprises should be excellent, the styles should keep up with the fashion trends, and the prices should be affordable. Can adjust according to market demand, rapid production listing, to meet consumer demand.

(2) Charge according to the actual effect

To undertake the enterprise project with the enterprise tutor and full-time tutor on campus, sign the cooperation agreement, and introduce it into the studio. The students in the studio have clear division of labor, cooperate with each other as a team, and build the project under the guidance of the teacher. In the early stage of the project, the studio will charge for the establishment of the store, and in the later stage, the studio will receive a commission based on the sales volume of the store. The studio space is provided by the school, and there is no need to pay the site fee and utilities. Only when the store has sales will it take a commission on the sales. Equivalent to agent operation, for enterprises, more affordable, low cost, according to the benefits of charging. For students, low cost, low risk, more learning, there are benefits.

(3) Resource integration to ensure the implementation of the project

The studio has optimized and integrated the resources of teachers, students and enterprises to form the core competitiveness. Enterprise mentor: experienced, good at operation, strong guidance; Teacher: responsible for project negotiation and team management, set up a team according to the store, ensure the implementation and implementation of enterprise projects, and after careful selection, students have a strong sense of excellent cooperation. Student: they are good at art, photography, operation, language customer service, high degree of cooperation, good communication.

(4) Complementary advantages. Win-win situation for students, enterprises and schools. For students, they cannot only apply theory to practice, but also continuously improve their operational level. Accumulate valuable experience for starting a business in the future.

4. CONCLUSION

With the rapid development of cross-border e-commerce, the traditional manufacturing industry is in urgent need of transformation, and the industry training faces the problem of talent shortage. Setting up a studio can solve these problems. The introduction of enterprise projects into the school studio and the joint leadership of enterprise tutors and teachers to carry out project practice and share project results can not only exercise the practical ability of students, but also reduce the cost of enterprises and indirectly improve the popularity of schools, so as to achieve a win-win situation for enterprises, schools and students.

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A Study on the Application of Affective Teaching Model in Yoga Teaching in Colleges and Universities

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Abstract: In modern sports, Yoga is the most agreeable one among the young, it has a high universal rate as well. What is more, gradually, with the introduction of Yoga education by universities in teaching system, which became a heated topic in the present physical education and was concerned by the teachers and students. This text will take the Yoga teaching as object to analyze the application from emotional teaching pattern, we hope that we can offer some related supports for the innovation of Yoga teaching of universities.
Keywords: Higher Education; Yoga Education; Emotional Teaching Pattern

1. INTRODUCTION

At the set of quality education implements completely, the physical education of university was increasingly thought highly of as the significant component and multiple new teaching forms are introduced to the teaching activities that lead to the development refined totally, which has important influence on the project of talent-cultivation. The Yoga education was introduced gradually by university under such background [1]. It was highly concerned in the process of real teaching activities. Therefore, it is necessary to study, analyze and put forward reasonable advice on the problem in Yoga teaching at new time. We hope that can reemphasize Yoga education in universities.

2. EMOTIONAL TEACHING PATTERN

Emotional teaching pattern originates from the Psychological theory of emotional teaching. In the process of real application, it applies to move the positive factors in emotion to accomplish the construction of steady teaching activities [2]. It can arouse the deep study of the student for the related knowledge by means of emotion to obtain ideal study effect. Under the background of the present quality education, if we introduce the rational emotion teaching in Yoga teaching, we can enable students have profound awareness of Yoga [3]. While we are enhancing our student's study effect, it can fully exercise function of purifying heart and tranquilizing mood. And it not only nudges students to grow healthily, but creates a good condition for the sound personality of students in the future.

3. PROBLEMS

After the introduction of yoga teaching into the system of physical education in colleges and universities, the popularity of yoga and students learning of yoga have a positive impact on the quality of physical education in colleges and universities has also been a certain the degree of promotion, and effectively promote the harmonious relationship between teachers and students [4,5]. However, the current situation of yoga teaching in colleges and universities, found that due to lack of systematic theoretical guidance, yoga teaching still has some problems, restricting the play of the role of yoga education: first, yoga teaching mode is relatively traditional, inflexible, teaching flexibility is insufficient, teachers cannot combine the individual differences between students and individual needs of the teaching activities to adjust appropriately, cannot give full play to the teaching effect. Second, in the yoga education, the relationship between teachers and students needs to be further strengthened. Although the relationship between teachers and students has been improved in the teaching of physical education under the function of yoga education, teachers and students still cannot achieve emotional resonance in yoga education, therefore, it is difficult for teachers to fully grasp the students learning status, and cannot develop targeted teaching measures, even affect the construction of harmonious teaching atmosphere, and then limit the reinforcement of teaching effect, it can be seen that the relationship between teachers and students has become an important factor affecting teaching quality in college yoga teaching. Therefore, in the new period, to further play the important role of college yoga teaching, to achieve the student's physical quality and psychological quality of the continuous strengthening, for the all-round development of students to create conditions, we should actively explore the reform measures of yoga teaching, introduce more advanced teaching ideas and teaching methods, and provide the corresponding guarantee for the function of yoga teaching.

4. MEASURES

In view of the existing problems in the teaching of yoga in colleges and universities, colleges and universities teachers in order to improve the teaching status, to provide students with high-quality yoga education and guidance services to promote the

healthy development of students physical and mental health, can try to introduce the emotional education model, for the college yoga teaching reform to make the right lead.

(1) Create a good atmosphere of teaching interaction, and promote emotional communication between students The creation of relaxed and free teaching atmosphere can relieve the students mood, make students maintain a positive emotional state in the course of study, and further increase the communication and communication among students, let the students in the harmonious teaching atmosphere to achieve emotional communication, get a good learning experience, to ensure that the students learning effect is further strengthened [3]. At the same time, the construction of harmonious teaching atmosphere can stimulate student's enthusiasm to participate in classroom teaching activities, strengthen students innovative thinking and creative ability, and learn more about yoga knowledge and knowledge the skills provide the corresponding protection.

For example, in the process of teaching yoga basic postures such as prayer, exhibition, before and riding, teachers can display demonstration videos to students with the help of the application of multimedia technology and through the functions of multimedia software to slow motion and enlarge the way of action will be specific action to complete the situation and attention to the students to show, so that students on the basic posture of yoga a preliminary understanding of the potential. On this basis, teachers in order to create a good learning atmosphere, so that students to maintain a relaxed state, can ask students to combine video, in the video soothing music to discuss why to learn yoga or what do you think is the beauty of yoga? problems such as the interaction between students, the relaxation of the mood in the exchange, the formation of a deeper understanding of the yoga movement, enhance students recognition of the yoga movement, in order to encourage students to participate in learning activities better under the role of identity, improve the learning effect of yoga skills, and feel the charm of yoga culture.

(2) Dialogue between teachers and students, seeking emotional resonance points Teachers should pay attention to the emotional guidance of students to stimulate student's emotion in the process of reform and innovation of yoga education with the help of emotional teaching mode, thus, the important role of emotional guidance can be brought into play, so that students can actively participate in the learning activities and achieve the desired results. Therefore, teachers in the specific teaching activities, need to select the appropriate point and students to communicate and communicate, so that students have emotional resonance, to ensure that students in the learning process to achieve the ideal learning effect fruit. For example, teachers can communicate and communicate with students when they are leading students to participate in meditation exercises in the yoga movement, for some students cannot get into the state of meditation quickly, seek emotional resonance with students so that students can get into the meditative state more quickly. If teachers communicate and communicate with students who cannot quickly meditate, they find that students are hard to clean up their minds and vent their thoughts in the light of enough light, while in the night scene, they are more content easy to enter the meditative state. Thus, the teacher can set the appropriate guidance words: the night hazy, in the ethereal moonlight, you are in a quiet bamboo forest... So, the targeted guidance to students, can stimulate student's emotional resonance, so that students quickly into the state of meditation, and achieve good learning results.

(3) Deep understanding, enhance the student's yoga performance ability. In the process of applying the affective teaching mode, we should not only pay attention to the effective emotional stimulation to the students, but also enable the students to keep a good learning state and achieve the ideal learning effect [5]. Also need to pay attention to guide students to deeply feel the charm of yoga, in the process of independent creation of yoga action can be fully integrated into the personal feelings, and in the action to show, ensure that the overall learning effect of the students is significantly strengthened.

In the concrete teaching practice, teachers should consciously guide students to organically integrate personal feelings with different yoga actions, and then to determine the theme of the creation of yoga action, can reasonably analyze the emotion and grasp the emotion, make sure to show the emotional tone of the yoga movement in the whole set of actions, and highlight the students personalized creative thinking and creative features, ensure the design and quality of the whole set of actions. Only in this way, the role of emotional teaching mode can be truly played, students understanding of the yoga movement will be more profound, help students comprehensive quality training.

5. CONCLUSION

In a word, the reasonable introduction of yoga teaching into the system of college education, to provide effective support for college talents training, can promote the healthy development of students physical and mental health, it also has an important influence on the cultivation of student's psychological adjustment ability. Therefore, college teachers should correctly understand the role of yoga education, and actively explore the corresponding teaching activities, to ensure that the role of yoga education to be fully play, for the college personnel training work the innovation of innovation provides the corresponding assistance.

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Analysis of Huanggang Reservoir Tourism Development Status

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Abstract: Reservoir is an important carrier of tourism development. From the reservoir factors in analyzing the value of its tourist resources in the reservoir on the function analysis points out the importance of tourism development, in Huanggang, for example, studies the feasibility of reservoir tourism development, necessity, points out the direction of reservoir tourism development and related principles. Through Huanggang reservoir based on the discussion of the necessity and feasibility of tourism development, analyzes the restriction and block the influence factors of Huanggang reservoir tourism development and problems, put forward the corresponding development strategy.
Keywords: Reservoir tourism; Resource development; Countermeasure analysis

1. INTRODUCTION

The number of Huanggang reservoir is the highest in Hubei province, with good tourism resource endowment, high grade, wide distribution and diverse types. There are many top tourism resources in China. Huanggang water culture has a long history. Up to now, it keeps the ancient traditions of dragon boat racing and water worship. Reservoir tourism development has a good historical heritage in Huanggang. The public has a high awareness of water tourism projects, a strong sense of identity, a high degree of enthusiasm for participation and a wide range of participation. It has formed a certain reservoir tourism market and successfully developed two national water conservancy scenic spots with broad prospects.

2. THE NECESSITY AND FEASIBILITY OF HUANGGANG RESERVOIR TOURISM DEVELOPMENT

Reservoir tourism reservoir lake tourism, mainly includes the core layer surrounding the reservoir shore sightseeing and leisure sports, diffusion layer ring reservoir tourism with three aspects of content, is based on the reservoir is rich in water resources, with the reservoir of aquatic biological resources, artificial building group and other projects, good natural landscape and the surrounding landscape, ecological landscape and cultural landscape of tourist attractions such as a way of travel.

2.1 NECESSITY OF RESERVOIR TOURISM DEVELOPMENT

(1) It is an inevitable requirement to protect water resources and ecological environment. In recent years, with the rapid development of tourism in Huanggang, surrounding the water conservancy scenic spot ecological environment quality suffer serious challenges, to speed up the construction of the reservoir tourism, the implementation of comprehensive protection and restoration project, will be conducive to the maintenance of water engineering, protection of water resources, improve the water environment, repair and maintenance of water ecology, carry forward the “water culture, the development of economy.

(2) It is a powerful embodiment of the strategy of implementing an environment-friendly and resource-conserving society. To promote reservoir tourism, ecological system construction with ecological protection priority and rational utilization as the center should meet the internal requirements of the development of “two-oriented society” and promote the ecological environment construction of Huanggang city.

(3) It is an important measure to rationally utilize water resources and promote the development of eco-tourism. Huanggang city is rich in water resources, reservoir tourism as the carrier, the construction of water conservancy scenic spot, can promote the rational development of ecological tourism process, open the strategic development of Huanggang city's tourism industry breakthrough, become a new economic growth point of Huanggang city. On the other hand, by carrying out reasonable water eco-tourism, leisure tourism and other projects to enrich Huanggang tourism resources, improve tourism structure, enhance tourism taste and promote sustainable development of tourism industry, it is also of great significance to promote local economic development, improve people's quality of life and provide jobs [1].

(4) It is an important way to meet people's growing spiritual and cultural needs. Taking reservoir tourism as the center, the establishment of water conservancy scenic spot can provide people with a good place for leisure vacation, self-cultivation and scientific popularization education, to meet people's growing spiritual and cultural needs [2].

2.2 FEASIBILITY OF RESERVOIR TOURISM DEVELOPMENT

(1) Superior natural conditions. Huanggang city belongs to the subtropical monsoon climate, the heat

is sufficient, the rainfall is abundant, the water and heat are synchronous, the four seasons are distinct, the scenery resources are beautiful, has the good hydrological landscape, the earth culture landscape, the biological landscape, the celestial phenomena landscape and the water conservancy project landscape; The scenic spot is rich in animal and plant resources, with high rate of soil and water conservation, high coverage rate of forest and grass, good habitat protection, good biodiversity and excellent air quality. It has good cultural landscape, folk opera, folk music, folk craft, folk dance and other cultural resources [3].

(2) Initial hard and soft conditions. The water conservancy scenic spot proposed by all counties and cities in Huanggang city has clear land ownership, clear right of use and management, better development and utilization conditions, better geographical location, obvious geographical advantages, good regional economic development, high degree of government support, and generally recognized by the society [4,5]. The scenic spot transportation is convenient, the management organization is clear, has the scenic spot development plan and the corresponding management system, has the safety management measure.

(3) Support from governments at all levels. The construction of reservoir water conservancy scenic spot conforms to the general policy of ecological construction in China, which has been highly valued by governments at all levels and is one of the important contents of ecological construction in China at the present stage [6]. Huanggang municipal people's government attaches great importance to the development of reservoir tourism and strongly supports the establishment of water conservancy scenic spots, and has listed the national water conservancy scenic spot of paradise lake and other scenic spots as the eco-tourism business card of Huanggang city in the construction focus soon and for a period.

3. PROBLEMS EXISTING IN RESERVOIR TOURISM DEVELOPMENT IN HUANGGANG CITY

3.1 LACK OF CHARACTERISTICS OF WATER DEVELOPMENT AND SINGLE PRODUCT STRUCTURE

Huanggang most reservoirs around the natural and cultural resources are rich, but most of the scenic area development aim to “swim mountain, playing with water, farmhouse, most belong to the low grade of tourism products” boat sightseeing tourism, fishing, etc., “culture form, XiangShouXing, less irritating, surprise, vacationing industry tourism, study of fitness, scientific exploration, understand local conditions and customs, and other special tourism, tourism characteristics are less, and neglected the characteristics of reservoir area itself, there are suspected of copying, cannot adjust measures to local conditions, reasonable use.

3.2 INSUFFICIENT MEDIA PUBLICITY AND LACK OF BRAND EFFECT

Huanggang currently has 17 national and provincial water conservancy scenic spot, but know the scenic spot of tourists can be said to be few and far between, because of the lack of overall publicity, many Huanggang reservoir water conservancy scenic tourist market is narrow, the condition of the off-season negative wait-and-see, the peak season, wait for customers, resources wasted excellent reservoirs.

3.3 LACK OF INVESTMENT SUBJECTS AND INSUFFICIENT DEVELOPMENT FUNDS

Due to insufficient funding sources, it is difficult to form a scale and achieve leapfrog development of infrastructure. It is difficult to develop and expand supporting facilities corresponding to “travel, travel, accommodation, food, purchase and entertainment”, thus affecting the process of reservoir tourism development in Huanggang city.

3.4 WEAK PLANNING AND SERIOUS BLIND DEVELOPMENT OF SCENIC SPOTS

The tourism planning of reservoir scenic spot is not standard enough, the evaluation and investigation of scenic spot design results are not enough, and the operability of design quality cannot be guaranteed. In some places, there is a lack of demonstration on the feasibility of tourism development in this area before the reservoir scenic spot is opened. The reservoir scenic spot resources have been seriously damaged, all these have hindered the benign and healthy development of reservoir tourism.

3.5 INSUFFICIENT RESOURCE PROTECTION AND FRAGILE ECOLOGICAL ENVIRONMENT

Tourism development can bring huge economic benefits to the reservoir, but at the same time it is bound to affect the ecological environment of the local reservoir area. The most obvious damage is the decline of water quality and environmental quality, soil erosion, vegetation destruction, air pollution and other problems. The ecological damage caused by reservoir tourism development is inevitable. How to coordinate and unify reservoir tourism development is the problem that needs to be solved.

3.6 INSUFFICIENT UNDERSTANDING OF RESERVOIR TOURISM AND LACK OF SPECIALIZED THEORETICAL GUIDANCE

In terms of the abundant reservoir resources in Huanggang city, the research on reservoir theory is too backward, which has affected the process of reservoir tourism development in Huanggang city, resulting in the lack of theoretical guidance for reservoir tourism development in Huanggang city and the inability of its successors. At the same time, the lack of reservoir theory indicates that the reservoir tourism system of Huanggang city is not perfect, and the reservoir tourism development of Huanggang city is not mature, so it is difficult to guide the practice of reservoir tourism development of Huanggang city.

3.7 THE PROPERTY RIGHT STRUCTURE OF THE SCENIC SPOT IS NOT CLEAR AND THE MANAGEMENT SYSTEM IS NOT SUITABLE

The property rights of Huanggang reservoir are mainly under the name of water conservancy department, which has inherent defects in the development of tourism resources, so it is difficult to reach an agreement with the tourism department on cooperation. The property right of reservoir tourism scenic spot is ambiguous and cannot be guaranteed by law, which affects the development of reservoir tourism.

4. COUNTERMEASURES AND SUGGESTIONS FOR THE DEVELOPMENT OF HUANGGANG RESERVOIR TOURISM

Huanggang reservoir is rich in tourism resources, diverse types, and has great potential for development. In the development of reservoir tourism, we should adhere to the development principles of environmental protection priority, market-oriented and operable, and choose different modes of recreation and recuperation, theme park and comprehensive tourism development according to different reservoir resource conditions. The following strategies should be adopted to solve the existing problems:

4.1 EXPLORE UNIQUE ELEMENTS OF RESOURCES TO FORM RESERVOIR TOURISM CHARACTERISTICS

Reservoir tourist areas have different landscape, constitute elements, different themes and contents of the reservoir area activities can also be rich and colorful, can reflect the local characteristics to the theme of the reservoir, the reservoir in the composition of the landscape, the size of the scope, the amount of tourist attractions, should be combined with the local environment, climate, customs, economic and cultural level, customers and other conditions. Take the road of characteristic tourism,

4.2 MAKE FULL USE OF SOCIAL NETWORKS TO INNOVATE TOURISM WEBSITE PUBLICITY

In the Internet era, to do a good job in reservoir tourism, Huanggang must make full use of social networks, open a reservoir tourism section to publicize the history, landscape, characteristics, matters needing attention and other aspects of each reservoir, and regularly promote activities on the Internet to attract public attention.

4.3 INCREASE INVESTMENT INTENSITY AND IMPROVE INVESTMENT ENVIRONMENT

It is necessary to proceed from the actual economic situation of the local area, adapt measures to local conditions, implement internal citation and external liaison, and establish a diversified investment mechanism of "government-led, market operation and social participation". We should adhere to the principle of government leadership, business operation and public participation, ensure that "whoever invests, develops and benefits", properly handle the relationship between enterprises, residents of the reservoir area and the government, achieve the unity of interests of the three parties, and raise funds through multiple channels, methods and levels.

4.4 INNOVATE TALENT MECHANISM AND RETAIN TOURISM TALENTS

To promote the development of reservoir tourism in Huanggang city, not only a good investment environment is needed, but also professional tourism talents are needed to provide guidance and support for reservoir tourism in Huanggang city. First, it is necessary to provide a good working and living environment for imported tourism talents and improve the mechanism and safeguard measures of talent aggregation. Secondly, it is necessary to establish a good cooperative relationship with institutions of higher learning and scientific research institutions, establish a talent pool, and smooth the channels for talent training. Finally, the local government can train professional talents, select some candidates to study or study in places with developed reservoir tourism and sign certain agreements to retain professional talents.

4.5 PAY ATTENTION TO OVERALL CONSIDERATION AND COEXISTENCE OF DEVELOPMENT AND PROTECTION

Tourism development in the reservoir, to plan as a whole to consider reservoir scenic resources utilization and protection, now and future, both on the coordinate, downstream, left, right bank, the local government and the interests of the masses, for improving water ecological environment, promote the construction of water conservancy projects and the combination of the natural landscape, cultural landscape, etc., and give full consideration to the tourism, construction of water conservancy construction, urban planning and coordination, comprehensive consideration of flood control waterlogging drainage, water saving water supply, ecological environment, popular science education and convenient service, pay attention to the local economic and social development planning, water conservancy planning and related special planning of cohesion and coordination, scientific planning, rational layout, Effectively promote the development of reservoir scenic tourism.

4.6 STRENGTHEN RESERVOIR COLLABORATIVE RESEARCH AND IMPROVE RESERVOIR THEORETICAL SYSTEM

From the government level, the government needs to promote certain incentive policies to encourage relevant professionals to study Huanggang reservoir tourism development. For example, the project of reservoir tourism development in Huanggang city will be released, and talents who have achieved certain scientific research results will be rewarded. From the perspective of scholars, tourism scholars need to calm down, attach importance to reservoir tourism in Huanggang city and take an active part in it. They are

willing to carry out relevant scientific research and share the scientific research results with the public. From the perspective of the public, cooperation and assistance with the government and scholars in reservoir tourism development will be conducive to the construction of Huanggang reservoir tourism development theory system.

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System Design Affects Executive Power

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Abstract: Executive ability is an important factor that determines the success or failure of an enterprise, and is the key to the formation of core competitiveness of modern enterprises. All problems in an enterprise or an organization can be attributed to the lack of executive power, but the lack of executive power is not due to the employees themselves. If the enterprise does not have a standardized and scientific management system, it will be difficult to improve the performance of the external performance without clear rules of conduct and conduct in the minds of employees.
Keywords: System design; Executive power

1. ENTERPRISE SYSTEM AND EXECUTIVE POWER

"State owned law, family rules", enterprise "law" and "regulation" is the enterprise system. Enterprise system refers to the economic relations of enterprises formed under certain historical conditions, including some important regulations, rules and codes of conduct in the economic operation and development of enterprises. Enterprise system is the foundation of enterprise management. It is the executive power that wants to play a fundamental role. No matter how good the system is, if it is not implemented, it can only be a dead letter, which will only lead to "the giant of language, the dwarf of action".

Execution refers to the ability to implement strategic intentions, achieve organizational goals, reflect the degree of implementation of goal decision-making, and is the comprehensive ability of departments and their employees to fully utilize available resources and means to achieve the company's skills objectives in the process of work. Enterprise development depends on the organic combination of system and execution. If system is the soul of an enterprise, execution is the body of an enterprise. The soul constructs the direction of enterprise development and the code of conduct, while the body realizes the soul's desire according to the will of the soul. Only with the perfect combination of the two, can an enterprise have lasting vitality [1-4].

2. THE STRENGTH OF THE SYSTEM

After receiving Haier, Zhang Ruimin promulgated the famous "thirteen management" to rectify the records; Wang Jianlin's ten-year quotation "not depending on loyalty system"; the greatest "business school" in the United States is not Harvard, not Stanford, but West Point Military Academy. The power of the system is obvious.

(1) The system is instructive and binding for staff work. The system has certain tips and guidance on what the relevant personnel do and how to carry out their work. It also makes clear what the relevant personnel should not do and what punishment they will be subjected to if they violate it.

(2) The system has incentives and incentives for employees. Complete and scientific system has clear rewards and penalties for employees' work. Sometimes, it will be posted or hung on the work site. It can encourage and encourage people to abide by discipline, study hard and work diligently at any time.

3, the system has normative and procedural content. The system plays an important role in realizing the standardization of work procedure, the regulation of post responsibility and the scientificalization of management methods. The procedural nature of the system provides a basis for people's work and activities to be followed.

3. EXECUTIVE POWER IS DESIGNED BY THE SYSTEM

(1) Humanization

In the "Sweeping Leaves" incident, the cleaner strictly followed the rules and regulations of the park, sweeping the fallen leaves without delay for a minute, but disappointed the tourists who wanted to enjoy the golden fallen leaves. In the initial formulation of the park cleaning system, the managers did not take into account the need of tourists to appreciate the beauty of deciduous leaves, and wasted the beauty of the park, which should have become a competitive advantage of the park.

The experience brought by the transportation system in the United States is "willing to be fined". This is because all road traffic in the United States is regulated. The signs next to the road clearly specify when the road can pass, where it can park, alternative routes and parking places during rush hours, and penalties for violations. Before formulating the traffic rules, the formulators of the traffic system have a comprehensive and in-depth understanding of the traffic situation. They are in the purpose of seeking convenience and efficiency for pedestrians and meeting the traffic demand of pedestrians to formulate the traffic system. Pedestrians in such a humanistic spirit of the traffic system, violating the system will naturally be willing to be punished. People-oriented and respectful system, people will be more awed and abide by the system, and then better to implement the system.

(2) Systematicness

A monk carries water to eat, two monks carry water to eat, three monks do not have water to eat, this story is

known to both women and children. One monk had water to eat, because he had finished all the work of carrying water by himself; two monks had water to eat, because they had finished the work of carrying water by division of labor; three monks had no water to eat, not because they were lazy, but because they had not cooperated in the task of collecting water. Similarly, in the enterprise management, if there is no reasonable division of labor, effective cooperation, strict supervision and rewards and punishments, it is very easy to cause the phenomenon of staff shifting responsibilities, resulting in inefficient execution of employees. In work, there are often no requirements or checks, arrangements or results, systems or rewards or punishments. Due to the lack of supervision, inspection and assessment, there is no innovation or breakthrough in the work, which stays at the level of superficiality and generalization. Many of the work has not achieved the desired results. Execution is not just a simple action force, but a systematic problem. In order to effectively implement the execution force, we should pay attention to its systematicness in system design. Systematic system is the important foundation of the execution system.

(3) Stability

Ren Zhengfei said to Huawei employees, "You are not allowed to make naive innovations within five years. Consultants are not allowed to move even if they think it is unreasonable. 5 years later, when the system is ready, I can authorize you to make partial changes. As for structural changes, that is 10 years from now. In the face of increasingly competitive market environment, some enterprises lose their direction in controlling and adjusting the stability and dynamics of the system. Enterprise managers often change the rules of the game under the guise of "changing on demand". The change of enterprise system will make employees feel confronted with a new uncertainty. In the future, some people will benefit relatively while others will be relatively damaged. Institutional construction must be stable, and the security system is relatively certain in a certain period of time, so that employees cannot change day by day and make them at a loss.

(4) Keep pace with the times.

The existing system only meets the needs of today's enterprises. With the development and change of enterprises, those invariable systems will only hinder the healthy development of enterprises. After the needs of enterprises and employees have changed, timely adjustments should be made according to the periodic changes, and the enterprise system should be changed and perfected in time, so that the system can really play its role. The scientific system should be rationally adjusted and innovating along with the different stages of development of enterprises. In today's world, the only thing that remains unchanged is change. Only by constantly changing and adapting to the changing environment can an enterprise remain invincible.

(5) Enhance tracking.

In the process of designing the system, we should give full consideration to the possible situations in the process of execution. In order to ensure its quality and quantity implementation, in the process of implementing the system, on the one hand, we should establish a checks and balances mechanism of mutual supervision between teams and employees. When violations are discovered, they should be reported promptly, rewarded and punished accordingly for those who fail to report the violations. At the same time, departments should follow up and supervise the implementation of the system in various departments, periodically assess, and effectively improve the execution of the system. On the other hand, the implementation of the system should also be checked regularly, not every system can be implemented. We should first use it in practice, and then look at the effect of the enterprise. If the effect is not good, the system cannot be carried out. This is a running-in period, depending on the implementation of the situation, depending on whether the enterprise has played a good effect, to track regularly, to understand the details. Employees' deviations should be given timely guidance and help, supplemented by systematic training, and gradually form a pragmatic and peak-climbing business atmosphere, in order to change employees' attitudes and behavior, and constantly improve execution.

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The Integration of College English Teaching and College Students' Ideological and Political Education

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Abstract: College students' ideological and political education has become the responsibility of every teacher. It has also become an integral part of public English teaching in colleges and universities. It has played an extremely important role in cultivating foreign language talents suitable for socialist modernization. This paper mainly explores the importance, methods and principles of ideological and political education in English teaching.
Keywords: college students, English, ideological and political education

1. INTRODUCTION

It is a long-term and arduous task to integrate the content of ideological and political education into the teaching of public English in colleges and universities. As an organizer and implementer of teaching activities, it is very necessary for English teachers to conduct in-depth research on this. In the teaching practice, we should further change the educational concept, highlight the integration of English teaching and ideological and political education, and pay attention to the interrelationship and supplement between disciplines [1-4].

2. THE IMPORTANCE OF IDEOLOGICAL AND POLITICAL EDUCATION IN ENGLISH TEACHING

Ideological and political education can promote the development of students' moral values. It plays a decisive role in the development of psychology, consciousness, emotion, will and personality. The contemporary students of our country lived under the socialist system from an early age and laid the foundation for the formation of a good moral outlook. However, the reality of China's primary stage of socialism and the development path of reform and opening up have inevitably affected the unhealthy trend of society and the influence of Western capitalism. English teachers must always follow the principles of education in our country. While carrying out language teaching, students' scientific worldview, communist morality, the proletarian firm stance and high political consciousness are cultivated.

3. THE CONTENT OF IDEOLOGICAL AND POLITICAL EDUCATION PATRIOTISM AND INTERNATIONALISM ARE THE FOUNDATION OF IDEOLOGICAL AND POLITICAL EDUCATION.

Patriotism refers to the loyalty and love of the motherland. The patriotism of the proletariat is based on the fundamental interests of the working people of the country. It is closely related to internationalism. It loves its own country, opposes foreign aggression, and respects the rights and freedoms of other countries and nations. In English teaching, students should be inspired to love the motherland. When choosing text materials for teaching, you should choose articles that express your love for the motherland, hometown, and people. Therefore, in the subtle influence, deepen the love of China's long history, ancient civilization and the hardworking and simple people who have worked hard for the development of the motherland. It is also necessary to cultivate students' pride as descendants of the Yellow Emperor. It is necessary to educate them to link their own development with the future of the motherland and to work hard for the prosperity, unity and prosperity of the motherland as their responsibility. The cultivation of internationalism cannot be ignored. Students should be soberly aware that China's development cannot be separated from the development of the world. Only in a world environment of peace, friendship, equality and the pursuit of common interests can China develop in a world environment where the world is opposed to hegemonism and safeguards world peace and the common development of all mankind. In the teaching of English, we must pay attention to the education of collectivism. It is necessary for students to understand that the masses of the people are the creators of history, to respect the masses, to proceed from the interests of the masses of the people, and to rely on the masses of the people. In the education of establishing the spirit of collectivism, students should be encouraged to actively participate in collective activities inside and outside the school, abide by the various rules and regulations of the collective, and care for the collective. Building China into a highly democratic and legal socialist country is one of the main goals of China's socialist construction. In English teaching, don't ignore the education of democracy and the rule of law. Students should understand the basic content of our country's constitution and laws, understand the essence of

socialist democracy, and correct the relationship between democracy and concentration, freedom and discipline. It is fully recognized that only socialist democracy can guarantee the realization of the legitimate rights and interests of the people, and then allow the existence of different viewpoints and opinions to enable the initiative and creativity to be exerted.

In addition, humanitarian education, idealism, traditional moral education, and the cultivation of labor habits cannot be ignored in English teaching.

4. THE METHOD OF IDEOLOGICAL AND POLITICAL EDUCATION IN ENGLISH TEACHING IN THE PROCESS OF IDEOLOGICAL AND POLITICAL EDUCATION, THE CHOICE OF APPROPRIATE METHODS AND METHODS ALSO PLAYS A DECISIVE ROLE IN THE EFFECTIVENESS OF EDUCATION.

4.1 English teachers must be educated consciously, systematically and systematically. Only in this way can students master the theory and knowledge of the system in order to promote the formation of their moral character, cognitive ability and values. In the process of English teaching, we must follow the principle of the unity of language teaching and ideological education, so as to improve the level of ideological and political while learning the language. Teachers can theoretically and practically explain the content of the textbook. When explaining the content of the textbook, you can also select related topics to improve students' cognitive ability by group discussion. Classes that are generally higher in English can also organize English debates, which not only improves the analytical ability, improves the level of thinking, but also increases the interest in learning English.

4.2 Ideological and political education must be implemented consistently. At the stage of school study, students' knowledge and skills are constantly improving, their psychological maturity level is constantly developing, and materialism is gradually forming. When the immature students are exposed to the bad thoughts in the society or in the process of learning foreign languages, and the one-sided understanding of Western society is influenced by some decadent thoughts, the original thoughts are easily shaken. Therefore, ideological and political education in English teaching must be sustained in order to achieve results. In order to cultivate a qualified successor to the socialist cause.

4.3 Teachers should not ignore the role of role models in teaching. The teacher itself is the role model of the student. The charisma of an outstanding teacher can even affect the life of the student. In addition, teachers can consciously select historical heroes, scientists and other people who contribute to human development, and use their deeds as a model for learning as a driving force for learning.

4.4 English teaching should not be limited to the classroom. Extracurricular English teaching is easier to carry out ideological and political education because it is not restricted by the teaching plan. It is also a good way to teach English reading materials with moderate difficulty. It is also a good way to write English after reading or group discussion or opening a report.

5. PRINCIPLES FOR IDEOLOGICAL AND POLITICAL EDUCATION IN ENGLISH TEACHING

5.1 Theory should be linked to reality. Whether it is teaching English knowledge or carrying out ideological and political education, it must be combined with social life practice. If we want students to understand the importance of English learning and like to learn English, we must let them understand the political environment of China's reform and opening up, as well as some relevant information after the birth of the world. In this way, we can understand the direction of social development, have a more specific understanding of our future, and have the motivation to learn.

5.2 Both English teaching and ideological and political education in English teaching should be taught in accordance with their aptitude. Teachers should understand the personality characteristics of each student and find out the advantages and disadvantages. By affirming the advantages of the method, gradually abandon the shortcomings and improve the personality. Also understand their inner world, because this is also the basis for the formation of ideological and moral. In this way, in education and teaching, different methods and methods can be used according to different ages, personality, family environment and life experiences of students, and students in accordance with their aptitude can be taught to cultivate the best students in the world with the most suitable methods.

5.3 While rigorously demanding students in teaching, students must be respected. As independent individuals, students should receive due respect. While teachers are strictly demanding students in English class teaching, they should pay more attention to methods and methods, and strive to create a friendly and harmonious atmosphere.

6. SUMMARY

English teaching as a language education course has its own unique characteristics. Its learners will inevitably be influenced by various aspects of the culture of the country in which the language is spoken. This has deepened the importance and urgency of ideological and political education in English teaching.

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Contract Spirit Stimulates Employee's Endogenous Execution Ability

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Abstract: For a long time, the enterprise's understanding of execution is often limited to the rapid process and the achievement of results, emphasizing the unconditional obedience of employees and the implementation of zero excuses. However, the execution force under external pressure may hide resistance, perfunctory and deviation under its efficient and fast appearance. Execution can not only rely on "drive" and "whip", only let execution from the heart, the executor can automatically and spontaneously achieve "unity of knowledge and practice.
Keywords: Contract spirit; Execution Ability

1. INTRODUCTION

To build endogenous executive power, we need to reshape the relationship between enterprises and employees and break the old idea that the relationship between enterprises and employees is regarded as "employment" and "being employed". Instead, the contractual relationship binds the interests and values between enterprises and employees, and builds the contractual-based sharing relationship between them. The two sides are mutually beneficial, coexisting, practicing the spirit of contract together, resolving the difficult problems of execution with the concepts of freedom, equality and trustworthiness, and transforming the execution power from appearance to endogeneity [1-4].

Interpretation of contract spirit

Contracts are promises or agreements with strong enforcement in law. The contractual relations and internal principles derived from them are the spirit of contracts, which are the spirit of equality, freedom and trustworthiness.

The spirit of "promise must be done" is the core of the spirit of contract. Once a contract is signed, both parties should abide by their commitments and consciously fulfill their respective rights and obligations. The premise of keeping faith is the equality of the status of the contracting parties, and the contract fully reflects the free will of both sides. Essentially, the spirit of contract is to promote fair trade and mutual benefit between the two parties. Losing equality and freedom may lay a hidden danger for the breach of contract.

2. LACK OF CONTRACT SPIRIT LEADS TO POOR EXECUTION

A company is so large that rules and regulations are small enough to make a formal verbal promise, and contracts are everywhere. The process of execution is also a process of reaching a contract. The quality of contract performance directly affects the effect of execution. The various phenomena of the lack of internal contract spirit will create obstacles to the deeper executive power.

(1) Unequal status, complaining

Influenced by the employment environment, employees in industrial relations are often in a disadvantaged position. They have no initiative in concluding contracts and are often in a dilemma of having to accept unequal agreements. The New York Times once reported that Amazon changed the world by squeezing its employees. The article listed various phenomena of Amazon squeezing its employees, including a woman who had just aborted and was asked to go on a business trip the next day. Amazon consultant Clay Parker Jones said: "Companies are increasing their intensity, forcing employees to do more work with less money."

Enterprises regard their employees as "tools of making money", and their employees are miserable and grumbling. When psychological balance is broken, negative indifference, complaint resistance and deviant destruction may follow. Tel Avis Karanik, a former CEO of Uber who has always advocated wolf sex, pays more attention to KPI than to fair and impartial practices in the workplace, which makes Uber scandals frequent and excellent employees flee, and enterprises are facing major crises. Xiaoming bicycle employees are dissatisfied with their wage arrears and lie to the media about the loss of the company's actual controllers, resulting in panic among users and a large number of users demanding a refund of deposit in a short time. Some scholars also studied the relationship between fairness perception and counterproductive work behavior. Skar1icki and Folger point out that employees may have negative emotions about unfair treatment, such as anger, resentment, etc., and attempt to redistribute and react to a series of direct and indirect actions, such as theft, gossip and idle work.

(2) Freedom is not in, mechanical execution

In the traditional top-down organizational management model, the authority of leadership is paramount, employees are taught to obey unconditionally and to execute without asking why. Employees lose the channel of freely expressing their

ideas and are subject to many constraints in execution. After Lehman Brothers declared bankruptcy in 2008, employees of Deutsche Development Bank injected a huge sum of money into Lehman Brothers after they knew the news of Lehman Brothers' bankruptcy because they had not been notified of the cancellation of the transfer. The employee's approach shows the super-standard system of the German Development Bank, but it has also become a "model" of mechanical execution. Loss of freedom, blind obedience will make employees lose their sense of autonomy, and gradually become "execution machine", only know how to do, unable to cope with changes. Blindly controlling and obeying will cause the malformation of executive power and cause enterprises to become "rigid".

It is undeniable that obedience culture has brought dividends to enterprises in the industrial age. Taylor's scientific management advocates the separation of management and labor, managers are responsible for thinking and planning, workers are responsible for execution, and draw a clear line between knowledge and action, which indeed improves production efficiency. But now machines will take the place of all the simple duplicative work, and ultimately leave us with jobs that require initiative and creativity. Therefore, we need to change the traditional management concept and give employees creative space. In addition, the advent of VUCA (Volatility Variability, Uncertainty, Complexity Complexity, Ambiguity Fuzziness) era, from the enterprise level, also needs to release freedom, activate employees, through hematopoiesis within the enterprise, to meet the subversive challenges brought by the external environment.

(3) Lack of credibility, discount execution

Ancient Rome proverb says: contract is the law between the parties. The fulfillment of the contract requires the parties to renew their faith and abide by the agreement as a law. Mr. Liu Hao, CEO of Zhaopin. com, said, "First of all, we should pay attention to honesty. Once a person is dishonest, his execution will be compromised". Strong execution is inseparable from the integrity and morality of employees. Employees who do not have credit, or who are not willing to speak or practice, or who "embroider their legs and tigers with their heads and tails", or who cheat or cut corners, will inevitably suffer a great discount in execution.

Entrepreneurs and managers often emphasize the integrity of employees, hoping that employees will treat the company and leaders honestly and be loyal to their duties. But some enterprises themselves are not good examples. Recruitment traps, contraction of promised income and selective amnesia of due treatment are difficult to fulfill. Employees may be forced by employment pressure and turnover costs, but their hearts will be dissatisfied, and loyalty will also decline. Lack of integrity, mutual suspicion between employees and enterprises, unable to win-win cooperation on the basis of mutual trust, will damage the common value of both sides.

3. SEEK THE FOCAL POINT OF "CONTRACT SPIRIT" AND CREATE ENDOGENOUS EXECUTION POWER

Peter Deruk said: the essence of management is to arouse and release everyone's goodwill. To recover the spirit of contract, its management appeal is to arouse the goodwill of employees and endanger execution.

(1) Equal contracting, balance of interests

A contractual relationship is like a seesaw. It requires a balance between rewards and rewards. The two sides interact and balance, and the seesaw can interact with each other. Excellent employees have made a lot of contributions to the enterprise, but have not received the corresponding returns, and even been "treated as mustard, abandoned as a failure". When the seesaw touches the bottom, it will also be the time when the contract is torn away. On the contrary, the excessive generous treatment and humanistic care provided by enterprises will also lead to the phenomenon of fostering lazy people and inaction, resulting in the loss of enterprise benefits. The key to building contractual relationship is to ensure equal status and mutual benefit.

Ren Zhengfei said about the relationship between employees and the company, "In Huawei, we don't need employees to be grateful. If an employee feels grateful to the company, it must be that the company gives him more than he contributes." The relationship between an enterprise and its employees depends on the spirit of contract rather than gratitude or emotion. Empty talk, gratitude and loyalty are meaningless. The alliance of equality and reciprocity is more acceptable. Bao Fan, founder of Huaxing Capital, once said, "An alliance is a contract. The success or failure of the alliance largely depends on the respect of both sides for the contract." After the bridge of equal contract spirit is built, enterprise management will change from competing for the interests of both employers and employees to fighting for the common interests of both sides, that is, from "based on their respective interests" to "based on implementation".

(2) Communication and empowerment, so that the effective implementation of contracts.

Without the spirit of freedom of contract, there will be two symptoms in the execution: one is the lack of free dialogue, the information exchange between the two sides is blocked; the other is that under the iron law of absolute obedience, employees have no right to play their creativity. Therefore, to arouse freedom and activate employees, we need to prescribe the right medicine from these two points.

The traditional communication mode of upload and delivery, leaders cannot hear the "front-line artillery fire", contracting often overlooks the "public opinion". Therefore, enterprises should change the way of

communication and create conditions to drain public opinion to the top. Zhu Jing, General Manager of Internet Finance Department of Weixin Society, often "fight" with employees in Weixin Group. He borrowed Yahoo's "Manage By Walking Around" working concept and created "Manage By Wechating Around" which is more suitable for Chinese situation. He threw questions in Weixin Group. Everyone said one word and one word, and quickly reached a consensus. . On the basis of freedom, full communication can effectively guarantee the accuracy and efficiency of execution.

Communication ensures the same desire and unity of mind. Next, you can rest assured that "let go" and empower employees. Haidilao waiters have the right to exempt from singles, and Zhang Yong, the chairman of the board, has handed over financial rights of less than 2 million yuan to managers at all levels. It is also this bold authorization of management, so that Haidilao employees can create all kinds of "abnormal services" from their hearts to impress customers. Professor Zeng Ming, Executive Vice President of Alibaba, said in his preface to Redefining Companies: "The most important function of future organizations is empowerment, not management or motivation." Empowering employees and allowing them to have autonomy in their work is actually a collective effort and a cohesive force for the development of enterprises.

(3) Be loyal to contracts and eliminate the dishonesty in execution.

Jews, who account for only 3% of the US population, operate over 70% of the wealth of the United States. Jews have always been associated with "elite" and "wealth". Some people say that the secret of Jewish business is "every word is a promise to God." They believe that "contract" is an agreement with God and must be observed. In business management, we often mention employee loyalty. Who is the target of loyalty? The Jews told us that both individuals and enterprises should be loyal to contracts and perform contracts.

Abide by the contract and keep promise is the common interest demand of employees and enterprises. An employee loyal to the contract is actually accumulating credit assets, and a reliable enterprise loyal to the contract will be highly respected. Only when employees and enterprises work together can they establish a solid foundation of honesty and trust each other can they stimulate the internal motivation of improving organizational effectiveness. Only by being loyal to the contract, building trust based on psychological contract and jointly pursuing the spirit of contract, can the execution ability be endogenous in the hearts of employees and in the whole organization.

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The Overview of Gap between Management Theory and Practice

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Abstract: Management theory is difficult to guide management practice and solve practical problems. Management practitioners are far away from management theory. Management theory and management practice are severely disconnected. This paper introduces the concept of the disconnection between management theory and practice, extracts the reasons for the disconnection between management theory and practice from two aspects of knowledge production and knowledge transfer and transformation, and sums up the ideas for solving the disconnection between management theory and practice from three aspects: academia, practice and interaction and cooperation between academia and practice.
Keywords: Management theory; Management practice; Disconnection; Evidence-based management

1. INTRODUCTION

Whether in the past or now, worldwide, the disconnection between management theory and management practice has always been a problem that managers and management practitioners need to solve [1-10]. Lynn (2015) believes that management research should focus on the relevance of practice. However, the fact is that management research often talks to itself, and research results can not guide management practice and solve practical problems. At the same time, management practitioners do not attach importance to the achievements of management scholars' research, while management practitioners pay attention to journals or books, but management scholars do not care. This inconsistency makes the gap between the two, and exacerbates the gap between management theory and practice [11-18]. On the other hand, despite a lot of research on management, there is still a lack of unified and effective opinions on how to graft the theoretical results of management research into management practice. This paper will review the valuable comments and Reflections on the disconnection between management theory and practice, and advocate the creation of more active, practical and effective management theory and practice.

2. THE CONCEPT OF DISCONNECTION BETWEEN MANAGEMENT THEORY AND PRACTICE

Sun Jiwei (2009) believes that the disconnection between management theory and practice means that management theory is difficult to guide practice and solve practical problems. There are four common disconnections in management research: reversing causality, repeating common sense, violating objective facts and repeating synonyms. Zhang Yuli (2008) also studied the disconnection between management theory and practice from the perspective of management practice, pointing out that the disconnection between management theory and practice is essentially determined by the level difference of management practice. On the one hand, management practice lags behind advanced management theory, on the other hand, management theory lags behind advanced management practice, but more importantly, management research and management theory are not related to management practice or relevant management theory has not been widely applied to management. In practice, the practical value of management theory is not well reflected.

3. ANALYSIS OF THE REASONS FOR THE DISJUNCTION BETWEEN MANAGEMENT THEORY AND PRACTICE

The analysis of the reasons for the disconnection between management theory and practice started from abroad at the earliest, and has been widely discussed in the world since entering the 21st century. The management circles have discussed and analyzed the causes of the disconnection from many aspects, but they mainly focus on the production, transmission and transformation of knowledge.

(1) Knowledge production

1) Researchers are wrong about the relationship between knowledge and practice. Shapiro et al. (2007) surveyed many scholars about the disconnection between management theory and practice. It was found that the respondents concerned about both knowledge production and knowledge output, and thought that they were separate and different. Peng He (2011) believes that the reason for the disconnection in knowledge production is that researchers neglect the practicality of research and do not study management issues from the point of practical value.

2) Academic evaluation and periodical requirements are increasingly disconnected. Xu Shuying and Lu Li (2015) pointed out in their interviews that "we focus on rigour because it is scientific and because it is the focus of journal editors and reviewers (most researchers) do not care about the real world". In a

sense, management academic journals have increased the separation of management research and results from management practice, rather than narrowing the gap between them.

(2) Knowledge transfer and transformation

1) The transformation mode is inefficient. Aguinis et al. (2012) counted 384 most productive researchers in management academia, and found that the high level of academic achievements they represented did not effectively translate into practical influence. In the "market" of management ideology, academic researchers are inferior to management consultants. The reason for their lack of competitiveness is the inefficiency of knowledge dissemination (Cao Suzhang, 2008). Management researchers do not have enough energy and motivation to translate research results into knowledge that can be applied and operated by enterprises.

2) The application chain of management is long and severely broken. From pure theoretical research to pure applied research, there exists a chain of gradual application and gradient conduction in most disciplines. Peng He (2009) pointed out that researchers close to pure theory are called first-level researchers, those close to pure application are called third-level researchers, and those in the middle are called second-level researchers. The transmission mechanism of the application of management theory is long and severely fractured. Most researchers of management theory fall into the awkward situation of "customer loss", which makes the management research results can not effectively guide management practice.

4. SOLUTIONS TO THE DISCONNECTION BETWEEN MANAGEMENT THEORY AND PRACTICE

Aiming at the problem of disconnection between current management theory and practice, the solutions put forward by academia can be summarized into three aspects:

(1) Start with academia

1) Reform the academic evaluation system. It is not feasible to solve the problem of disconnection only by the self-efforts of management researchers. To solve the problem of disconnection, we must reform the academic evaluation system. Sun Jiwei (2009) gave some suggestions to solve the disconnection: (1) correcting the misuse of peer customer evaluation with the help of "quoter" index; (2) using "reader, user" index to assess the second and third-level researchers.

2) Improve the school-running policy and education system. Business schools should use more effective methods to deepen the relationship between managerial researchers and practitioners, so as to enhance the practicability of management research results. In view of the improvement of postgraduate projects, Tushman & O'Reilly (2007) believes that postgraduates should focus on the choice of research topics, rather than on the existing regular research, and from the important issues of phenomenal identification management, they can exercise their ability to apply basic knowledge and theoretical methods.

(2) Starting from the practical circles

1) Actively promote evidence-based management. In recent years, some scholars in the management field advocate evidence-based management. In the Internet industry, marketing management and other fields, evidence-based management is also trying to solve the problem of disconnection between theory and practice. Liu Chang'e and Ding Hongtao (2011) pointed out that evidence-based management advocates practical decision-making should be based on theoretical research results, so as to make better decisions and better implementation. Rousseau (2007) believes that the basic meaning of evidence-based management is to transform the proven effective management theory results into concrete operational organizational behavior, that is, knowledge not only needs to be produced, but also useful knowledge can bring output to enterprises, which provides a direction for solving the problem of disconnection.

(3) Integration of academia and Practice

1) Strengthen the relationship between researchers and practitioners. Academics and practitioners should cooperate with each other so that management research results can have an impact on management practice, and management practice can also have a positive impact on academic research. Tushman et al. (2007) argues that senior management education can create a more specific atmosphere for Business School researchers and management practitioners to establish links and promote the effective integration of management theory and practice.

2) Give full play to the basic role of education and promote the promotion of evidence-based management. To make management education truly benefit society, school education is absolutely duty-bound. Enterprise universities, training centers, consulting institutions, think tanks and other educational institutions are also duty-bound. At the same time, the efforts of government departments, enterprises, students, media and non-governmental organizations are also indispensable (Kathleen Muff, 2014). Evidence-based management will not work if education does not provide the basis for understanding scientific evidence or if such education is not strengthened in schools. Management researchers should also incorporate research findings and paradigm insights into curricula and textbooks in a way that readers can understand, so that students and management practitioners can use them.

5. SUMMARY AND PROSPECT

To solve the problem of disconnection between management theory and practice, on the one hand, academic circles need to face up to their own problems and take actions of self-reform. On the other

hand, practical circles need to actively adopt the research results which have been proved effective repeatedly by academic circles and actively play the role of professional associations. More importantly, academic circles and practical circles need to interact. Cooperate to play the basic role of education. Management research facing practice must integrate value rationality and instrumental rationality. Only by combining the two can we get more valuable research results (Zhao Liangyong, 2016). Only in this way can the theoretical achievements of management research have greater influence on management practice, which is also the dream of the whole management circle.

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Research Review of the Relationship between R&D Investment and Enterprise Performance and Future Prospects

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Abstract: The relationship between R&D investment and enterprise performance is a common concern of both theoretical and practical circles. At present, a lot of valuable achievements have been achieved in the related research, but the diversification of the relationship between R&D investment and enterprise performance cannot provide strong theoretical guidance for practice. This paper systematically reviews the achievements of R&D investment and enterprise performance, and summarizes the influencing factors of the relationship. Finally, on the basis of in-depth analysis of the shortcomings of the existing research, the future research directions are pointed out.
Keywords: R&D Investment; Enterprise Performance; Research Review

1. INTRODUCTION

"Mass innovation and innovation" has become the engine of China's economic growth. Under the background of "double creation", R&D is very important to the growth of enterprises and the key to enhance the competitiveness of enterprises. According to the theory of economic growth, stable and continuous economic growth depends on technological progress, and R&D is a powerful guarantee of technological progress. For enterprises, a reasonable R&D investment and appropriate R&D strategy is particularly important.

R&D investment and enterprise performance have always been the focus of attention in academic circles. There are many empirical researches in foreign countries, and many achievements have been made. Document research mainly focuses on the manifestations and influencing factors of the relationship between R&D investment and enterprise performance.

Among them, the research on the influencing factors keeps warming up, and the relationship between them is analyzed from the perspective of pre-factors, regulatory variables and intermediary variables. This paper adopts the analytical thinking of: What is the relationship between R&D investment and enterprise performance? What factors influence the relationship between them?

How to influence the relationship between R&D investment and firm performance is reviewed.

2. RELATIONSHIP BETWEEN R&D INVESTMENT AND FIRM PERFORMANCE

The research on the relationship between R&D investment and enterprise performance has not yet formed a mature theory. Relevant literature explores the possible relationship between R&D investment and firm performance from different theoretical perspectives. The relationship between R&D investment and firm performance has many forms: the positive correlation between R&D investment and firm performance is the mainstream view. In addition, some scholars observed the phenomenon of R&D investment jump when they observed the actual R&D investment activities of enterprises. They explored the relationship between this phenomenon and enterprise performance, and this paper also combed the literature.

(1) R&D input has a positive effect on enterprise performance.

Some scholars have found that R&D investment has a positive effect on enterprise performance. Falk [1] validates the data of R&D enterprises in Austria from 1995 to 2006. The results show that R&D intensity has a significant positive impact on the employment and sales growth of enterprises in the next two years. Chandan Sharma [2] made similar conclusions. He used post-reform data from 1994 to 2006 to study the impact of R&D activities on the performance of Indian pharmaceutical companies. The results show that R&D intensity has a positive and significant impact on TFP. Xue Qinggen [3] Based on Provincial Panel Data of China's high-tech industry, compares the performance of R&D investment of enterprises, RD investment of government and technology loan of banks on technological innovation. The conclusion shows that the performance of R&D investment is better than the other two types of investment, and the overall R&D investment has a significant effect on the performance of enterprises.

(2) R&D investment has an inhibitory effect on enterprise performance.

From the existing literature, the relationship between R&D investment and corporate performance is relatively small. Guo Bin [4] studies the relationship between R&D activities and corporate performance in China's software industry. Research shows that R&D intensity has a significant negative effect on profit

margin, and also has a certain negative effect on output rate. Chen Jianli et al. [5] based on the data of Listed Companies in China's electronic equipment manufacturing industry in recent five years, this paper studies the relationship between R&D investment intensity and performance of enterprises in the electronic equipment manufacturing industry. The results show that the R&D investment intensity of enterprises has a significant negative correlation with the current performance of enterprises.

(3) there is no significant correlation between R&D input and firm performance.

Lin et al. [6] studied the main impact of R&D intensity on corporate performance based on patent and financial data of 258 U.S. technology public companies. The results showed that the relationship between R&D intensity and Tobin Q value was not significant. Zhao Yuehong and Xu Min [7] take listed companies in the Yangtze River Delta region as an example to conduct empirical research. The conclusion is that R&D investment of enterprises has no significant impact on corporate performance. Du Yong and other [8] studies have similar conclusions. They found that there is no significant correlation between R&D investment and business performance of high-tech enterprises.

(4) R&D input has nonlinear correlation with enterprise performance.

Dai Xiaoyong and Chengliwei [9] based on the data of Chinese industrial enterprises, the threshold panel data model is used to analyze the non-linear relationship between R&D investment intensity and firm performance. The results show that there are significant differences between the first threshold and the second threshold of R&D investment intensity on firm performance, the former significantly promotes firm performance, while the latter has no significant effect on firm performance. Sheng Yuhua and Lu [10] use the unbalanced panel data of A-share listed companies to prove the "inverted N" curve relationship between R&D investment and corporate performance.

(5) Interaction between R&D input and firm performance.

The research in academic circles affirms the interaction between R&D input and enterprise performance. Mario I Kafouros points out the impact of profit margins on R&D investment. Li Zhongqin and Zhou Qin [11] believe that R&D investment has an endogenous relationship with enterprise performance. R&D investment affects enterprise performance from two aspects, one is indirect impact, through the role of R&D efficiency. The two is the direct impact on enterprise performance. The conclusion shows that R&D investment and firm performance have significant influence on each other, and R&D efficiency is the mediating variable in this relationship. In research methods, they adopt the generalized matrix method to better solve the endogenous problem, and make the conclusions more convincing.

(6) Relationship between R&D input volatility and firm performance.

In order to explore the complex relationship between R&D investment and firm performance, in the latest research, some scholars have extended the research perspective, paid attention to the impact of R&D investment jump on firm performance, and expanded R&D investment from static absolute amount to dynamic change amount. Scholars from the "earnings manipulation hypothesis" and organizational learning theory to study the relationship between R&D investment fluctuation and firm performance, but draw the opposite conclusions.

The earnings manipulation hypothesis holds that institutional investors act as "traders" rather than "owners" and pay too much attention to short-term development, so they fear that income disappointment will lead to large-scale institutional investors selling and lead to a temporary decline in corporate stocks. At this point, managers will reduce R&D investment to achieve short-term goals of higher returns. It can be inferred that the change of R&D investment will restrain the normal R&D activities of enterprises and hinder the improvement of enterprise performance. Bushee B J [12] makes an empirical study using data available to all U.S. companies from 1983 to 1994. The results show that, compared with individual investors, institutional investors' large shareholding and complexity enable them to supervise and restrain managers and ensure that managers make R&D investment decisions to maximize long-term prices. Value, rather than short-term revenue target. However, due to the high level of institutional ownership and the high proportion of ownership of institutions with short-term ownership characteristics, managers are greatly increased the possibility of reducing R&D to increase revenue.

The theory of organizational learning believes that the growth rate of R&D investment is positively related to the performance of enterprises. At the same time, management experience has a positive effect on R&D input. The view of technology and innovation management also holds that increasing R&D investment over time is beneficial to company performance. Beginning with Arrow [13], traditional innovative economics studies argue that social investment in R&D is inadequate, and private companies in particular tend to invest. Big firms undertake R&D to protect oligopoly, while small firms seek to gain first-mover advantage, both of which are maintainers or enhance corporate value. Cohen and Levinthal [14] present evidence that R&D expenditure enables firms to increase their ability to apply knowledge to business purposes. These studies show that R&D investment is always beneficial to enterprises and society, and the main goal is to encourage more R&D investment.

In view of the above two contradictory conclusions, Mudambi and Swift [15] innovatively put forward R&D investment leap, which is regarded as one of the most abnormal changes in R&D investment, that is, the largest increase of R&D investment deviating from the historical trend in a certain year. The research confirms that the jump in R&D investment is positively related to corporate performance. Domestic scholars Wu Jianzu and Xiao Shufeng [16,17] studied the jump in R&D investment based on the Chinese situation. The research also shows that the bigger the R&D investment jump, the higher the enterprise performance. On the basis of this research, Wu Jianzu and Xiao Shufeng further subdivide the R&D investment jump into positive jump and negative jump and conduct empirical research. The results show that both positive jump and negative jump have significant promotion on enterprise performance. Use.

3. THE FACTORS AFFECTING THE RELATIONSHIP BETWEEN R&D INVESTMENT AND FIRM PERFORMANCE

From the above literature review, we can see that the relationship between R&D investment and corporate performance is diversified, which makes it difficult for current research to provide systematic guidance for practice. Therefore, it is necessary to further explore what factors affect the relationship between the two, so that it presents a variety of forms of relationship, so as to better explore the mechanism of R&D investment and corporate performance. Based on the existing literature, the following factors are sorted out as follows:

(1) Pre-variables mainly focus on the analysis of influencing factors of R&D investment, from macro to micro. On the macro level, the impact of government subsidies and environmental regulation on R&D investment is relatively mature. As a support policy given by the central and local governments, government subsidy promotes the motive force of technological innovation of enterprises to a certain extent. Oliviero A. Carboni studies based on Italian manufacturing data show that government subsidies have a positive impact on private R&D investment. Chen Ling and Yang Wenhui found that the R&D subsidy policy of the Chinese government has a significant incentive effect on the R&D investment of enterprises. Sun Xiaohua and others divided the R&D behavior of enterprises into two stages: whether or not R&D and how much R&D investment, and studied the impact of government subsidy on R&D decision-making of enterprises with different ownership. The results show that state-owned enterprises lack motivation for R&D investment due to the constraints of practical factors, and the incentive effect of government subsidies is not obvious. The impact of environmental regulation on R&D investment comes from the famous “Porter hypothesis” theory, which holds that the strengthening of environmental regulation can enhance R&D investment of enterprises. Subsequently, scholars have carried out empirical verification of the theory. Research by Jaffe, Ambec, Jiangke and Jiu Maohua scholars confirms that environmental regulation does have a positive impact on R&D investment of enterprises. At the meso level, the representative achievement is to study the impact of industrial technology attributes on R&D investment. According to the theory of technological attribute of industry, technological opportunities and the degree of innovation protection affect the innovative activities of enterprises. Malerba, Osenigo and other studies have found that small and medium-sized enterprises are more likely to invest in R&D in industries with higher technological opportunities, lower monopoly, lower technology accumulation and less dependence on scientific research basis. Wang Fang and Zhao Lanxiang studied the impact of innovation monopoly on R&D investment in industries with more technological opportunities. The results show that in industries with more technological opportunities, enterprises tend to invest in R&D, and the relationship between technology monopoly and R&D investment is inverted U. At the micro level, scholars believe that the characteristics of managers will affect R&D investment decisions. Bertrand and Schoar found that CEO with MBA education was biased towards lower R&D investment. Carpenter and Geletkanycz found that the greater the heterogeneity of managerial teams, the more opportunities they would identify, and the more R&D investment they would stimulate. Li Sihai and Chen Xuan take high-tech enterprises as examples, and verify the relationship between Chinese entrepreneurs’ technological professional background, R&D investment and investment performance based on their professional background of education. Research shows that entrepreneurs with technological backgrounds usually have more willingness to invest in R&D. According to the theory of enterprise behavior and prospect, the gap between reality and expectation is the basis that affects the risk taking of enterprise managers. He Xiaogang et al. took the data of Chinese private listed companies as samples, and empirical results showed that enterprise decision-makers increased R&D investment with the increase of enterprise expectation gap. In addition, scholars also interpret the relationship between R&D investment and corporate performance from the perspective of life cycle. Liang Laixin, Chen Harvest research shows that R&D investment in the growth and maturity period has a significant impact on current corporate performance, but the cumulative effect of R&D investment in the mature period is shorter than that in the growth period; while in the declining period, the results do not have a significant impact. These research results provide a reference for R&D investment decisions of enterprises at different life cycle stages.

(2) Moderating variables, representative research mainly includes corporate governance, customer implicit demand, redundant resources and so on. The impact of corporate governance is mainly manifested in alleviating agency problems in R&D process and controlling the speculative behavior of managers; related literature studies corporate governance issues from the aspects of board meeting intensity, board size, equity incentives, knowledge background of managers, heterogeneity of senior management team, etc. Beasley proves that good corporate governance can effectively reduce the possibility of fraudulent R&D input data in financial reports; Cheng and Courtenay research shows that firms with external directors' control have strong willingness to voluntarily disclose, which leads managers to be afraid to engage in profit and loss projects, and the performance of firms is guaranteed. Ren Haiyun research shows that state-owned holding and board meeting intensity negatively regulate the relationship between R&D investment and corporate performance, and managerial equity incentive has a positive regulatory role. He Qiang and Chen Song found that board size negatively regulates the relationship between R&D investment and corporate value. According to Zhang Qixiu, ownership structure includes two aspects: equity checks and balances and equity concentration. The former has a positive moderating effect on the relationship between R&D and corporate performance, while the latter has a significant negative moderating effect on the relationship between R&D and corporate performance. Zhang Zhenxin et al. found that the scientific and technological background of chairman, general manager and major shareholders can effectively increase the R&D investment of enterprises. Qi Xiuhui found that executive equity incentive positively regulates the relationship between R&D investment and corporate performance, while incentive incentive has no significant effect. Wang Yanni and Song Ting found that age heterogeneity and education heterogeneity of top management team can be used as pure moderator variables to effectively regulate the relationship between R&D investment and corporate performance. The increase of executive tenure will also significantly promote R&D investment, while the size of executive team will negatively affect corporate performance, but neither of them is a moderating variable. Hu Mingxia research shows that structural power negatively regulates the relationship between technological innovation investment and enterprise performance. The agency cost between shareholders and executives increases because of structural power, which further hinders the technological innovation investment of enterprises. Reputation power positively regulates the relationship between technological innovation investment and enterprise performance.

Recessive needs refer to a kind of psychological needs and states that customers can satisfy or exceed customers' expectations in order to satisfy higher spiritual needs or stimulate human senses through objective things and use them to arouse people's subconscious or uncertain needs in the brain. Research shows that the discovery of implicit demand information has a positive effect on the success of innovative products. Only when the product innovation meets the needs of the customers will the customer choose the new product. Higher customer implicit demand can improve the market recognition of new products and improve enterprise performance. Taking 1016 innovative enterprises in Tianjin as samples, Zhang Huiying and Li Zhendong analyzed the moderating effect of implicit customer demand on innovation input and market performance. Bradley and believe that enterprises with non redundant resources will increase R&D investment. Salge and Vera find that redundant resources make managers too diversified and waste R&D investment. Jiang Weiping and Liu Daidi found that precipitative redundant resources had a negative moderating effect on the relationship between R&D investment and firm performance, while non-precipitative redundant resources had a positive moderating effect on the relationship between them. It should be pointed out that there are many variables regulating the relationship between R&D investment and firm performance. Therefore, we only choose representative studies to explain the impact of these factors on the relationship between R&D investment and firm performance.

(3) Intermediate variables refer to the factors that influence the relationship between R&D investment and firm performance. For a long time, many studies regard the relationship between R&D investment and firm performance as a "black box". In recent years, some scholars have begun to explore the internal mechanism of the relationship. At the present stage, the conclusion is that technological innovation has a mediating effect in the relationship between them. Ge Jun and Zhu Ping used the data of Listed Companies in Shanghai and Shenzhen Stock Exchanges to explore the role of innovation patents in R&D investment in enterprise performance mechanism. Research shows that technological innovation plays a full intermediary role in the relationship between them, that is, R&D investment can have a positive impact on enterprise performance through technological innovation. The research also finds that although R&D input has a significant contribution to all kinds of patent output, in our current environment, patents cannot effectively represent technological innovation to promote enterprise performance, and the intermediary effect of patent output is not significant.

4. RESEARCH REVIEW AND FUTURE PROSPECTS

(1) Current research review

More and more researchers pay attention to the relationship between R&D investment and firm performance. They have made fruitful achievements in the research of the relationship between R&D investment and firm performance and their regulatory variables. In addition, researchers are constantly expanding their research perspectives, such as the fluctuation of R&D investment on firm performance. The impact has also started to attract a lot of attention. However, through literature review, the author also found that there are still some deficiencies in the research, which are embodied in the following points:

First, there is no theoretical support for the relationship between R&D investment and firm performance. At present, scholars mainly focus on the empirical study of the relationship between R&D investment and corporate performance. However, the lack of theoretical basis for the diversified relationship between R&D investment and corporate performance leads to the lack of a clear understanding of why there are so many complex manifestations. It can be said that more attention has been paid to the surface relationship between R&D investment and enterprise performance, and less to the logical relationship between them.

Second, the understanding of the concept of R&D investment is still limited. Most researchers still focus on the absolute amount of R&D investment. For example, the number of R&D personnel and R&D amount should be used as an alternative to R&D investment. This also leads to more similar conclusions in the existing literature, which is not conducive to the improvement of research gaps in this field, nor is it conducive for enterprises to pay attention to the transformation of their R&D investment strategies.

Three, there is little research on the relationship between R&D input and firm performance. Only a few researchers put forward innovative patents to carry out empirical tests. The absence of intermediary variables will lead to the failure to clarify the role of R&D investment and corporate performance. In practice, enterprises cannot implement targeted R&D strategies, resulting in waste of R&D investment and poor corporate performance.

Fourthly, the research paradigm is relatively single. Most of the existing studies use second-hand data and statistical software to carry out quantitative research, which leads to a direct conclusion. The lack of qualitative research is not conducive to further study the internal relationship between variables, and then test and develop the existing theoretical system.

(2) Future research prospects

Therefore, after sorting out and reviewing the existing literature, this paper argues that future research can be carried out from the following aspects:

First, we should enrich the factors affecting the relationship between R&D investment and enterprise performance, and further analyze the mechanism of action process. The factors affecting the relationship are complex and diverse. From the perspective of individuals, enterprises and networks, we can consider the personal characteristics of R&D investment managers, R&D management institutions, social networks and other factors. Only by deeply analyzing the mechanism of the relationship between R&D investment and enterprise performance, can we put forward more constructive solutions and better enrich and improve the theory of the relationship between R&D investment and enterprise performance. In particular, more attention should be paid to the research on intermediary variables between R&D investment and firm performance, and more innovative research results should be produced.

Second, strengthen the theoretical research on the relationship between R&D investment and enterprise performance. This paper explores the reasons for the diversity of the relationship between R&D investment and corporate performance, and clarifies why R&D investment can promote and inhibit corporate performance. Drawing on the relevant research literature from abroad, combined with the actual situation of enterprises, we find out the theoretical support behind it.

Thirdly, while paying attention to the absolute amount of R&D investment on enterprise performance, we should also pay attention to the impact of the amount of change in R&D investment on enterprises that cannot be ignored. R&D investment jump, a relatively new variable, is the focus of the study. For example, what factors will lead to the phenomenon of R&D investment jump in enterprises, and how R&D investment jump will affect corporate performance are also worthy of further study and discussion.

Fourth, we need to combine empirical research and qualitative research to explore the relationship between R&D investment and corporate performance. With the financial reform and economic development, the research situation has changed. In the future, exploratory case analysis can be used to select representative business practice cases to deeply analyze the relationship, influencing factors and mechanism between the fluctuation of R&D investment or R&D investment and corporate performance. Longitudinal tracking research can also be used. In order to better understand and grasp the whole process of R&D input on enterprise performance.

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Research of Information Technology Application in the Teaching Reform of Higher Vocational Construction Equipment Engineering Course

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Abstract: Construction equipment engineering is a professional course for architecture majors. It requires high practical ability for students, but the traditional teaching materials and teaching mode of construction equipment engineering are backward, which cannot meet the needs of enterprises for high-quality applied talents. To this end, we introduce a variety of information methods to improve student participation and enthusiasm, trying to change the teaching effect. This paper has carried out the teaching plan design for teaching content, teaching methods and teaching evaluation. It is hoped that through the information-based teaching design, the teaching reform of the construction equipment engineering course will be promoted, and the students' learning ability will be further improved, and the students' knowledge will be expanded to better meet the needs of the society.

Keywords: informationization; higher vocational education; construction equipment engineering; teaching reform

1.THE TEACHING DILEMMA OF THE CONSTRUCTION EQUIPMENT ENGINEERING COURSE

Construction equipment engineering is an indispensable part of building construction. This course is a professional compulsory course for higher vocational construction engineering technology. It is a professional and difficult course. The course involves the construction and acceptance specifications and standard atlas of the installation project, as well as new technologies, new materials and new processes in the construction engineering technology. Through the study of the construction equipment engineering course, students can have the necessary skills for construction technicians and construction engineering cost engineers, which can improve students' professional skills and improve students' comprehensive practical ability.

Theoretical knowledge is difficult to achieve in practice

Similar to other engineering majors, the professional courses of architecture engineering are very theoretical. When students learn theoretical knowledge, they feel that they are not well understood and cannot find points of interest. In practice, because the theoretical knowledge is not mastered, the purpose of learning is not Clear [1]. In recent years, the teaching and research group has also actively adopted the project-based teaching method, taking the work tasks in the real work situation as the basis of learning, and guiding students to understand the theoretical content in the textbook from the actual tasks. However, we found that the project teaching method has alleviated the embarrassing situation that students can't connect theory with reality to a certain extent. However, the theoretical knowledge that most students learn in advance according to the project content is scattered and incomplete, and it is impossible to combine independent knowledge point systems.

With the rapid development of science and technology, many new materials and new technologies will be used in the actual work of construction engineering, but the update of knowledge in textbooks is obviously slower than the speed of using new technologies in actual projects. This has led to a situation in which the content of the teaching does not match the content of the actual work. Take the August 2016 edition of the "Construction Equipment Installation Engineering" textbook of a publishing house used by our school's construction engineering technology. For example, under the "common electric light source" content, the first one is still about incandescent lamps. . According to the "China's Roadmap for Eliminating Incandescent Lamps" published by the National Development and Reform Commission, incandescent lamps have completely withdrawn from the Chinese market since October 1, 2016. The intake of this unequal knowledge is in urgent need of change.

In project-based teaching, students need to prepare the course content in advance, find relevant information, and prepare the course in advance [2]. However, most students do not have enough effective information extraction ability in the actual teaching process. Students still do not understand the main content of the course well and will lose interest more and more.

Build a resource sharing learning environment to achieve personalized learning

Using information resources for teaching, we can use various multimedia resources to integrate teaching content and information technology, change traditional boring learning methods, and motivate students. In the past, the Ministry of Education has set up a number of excellent course websites, and the pre-study points published by teachers before the class through tools such as network cloud disk, superstar learning pass, and UMU interaction. Students can fully realize their own using this information-based shared learning environment. Personalized learning.

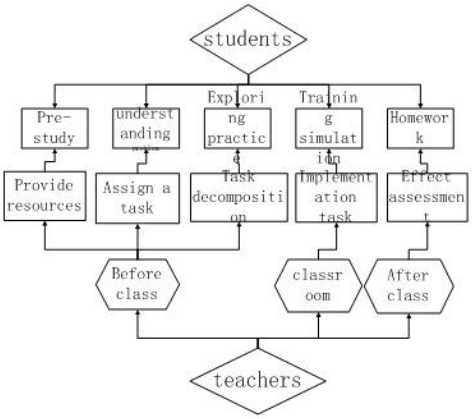
In the face of the wave of informatization teaching reform, as a teacher of higher vocational colleges, from the concept and professional skills, we must make changes in conformity with the development of the times. Teachers should be familiar with the latest norms in the industry, familiar with informational teaching software, and use various teaching platforms to publish, upload, and download content [3]. During the collaboration between the author's school and the Dutch School of Canada, the author personally experienced the classroom of the Dutch School of Canada. In North American classrooms, teachers are used to using Plickers and Kahoot! to motivate students. At the same time, the development of informatization also requires teachers to read and understand the English information in the industry, to help keep abreast of professional development trends and the latest technology. These require teachers to improve their professional skills in many ways.

Figure 1 Plickers and Kahoot! For teaching

With the development of science and technology, the development of new technologies and new processes in the construction industry is also changing with each passing day. The use of information technology to reform the curriculum of architecture, which also makes up for the shortcomings of the slow update of teaching materials, is conducive to students to learn the latest theoretical research results, become the application-oriented talents required by the civil engineering industry, and also reflects the students' Subject status [4].

2.THOUGHTS ON THE DESIGN OF COURSE TEACHING BASED ON INFORMATION TECHNOLOGY

Taking the building electrical lighting chapter in the construction equipment engineering course as an example, the project information teaching design idea is shown in Figure 2.



Fiugre 2 The process of students' interest

3.THE DESIGN PROCESS OF INFORMATION TEACHING

This case is selected from the section "Building Electrical Lighting" in the Construction Engineering Equipment course. The content of this chapter requires students to master the basic concepts of electrical lighting in buildings; familiar with the characteristics of common electric light sources and types of lighting, lighting types and illumination standards of buildings, selection and arrangement of lamps; understanding the common calculation methods of illumination and the general process of electrical lighting design. In the process of teaching implementation, we improve the teaching effect from four stages: pre-study, classroom teaching, practical practice, and evaluation.

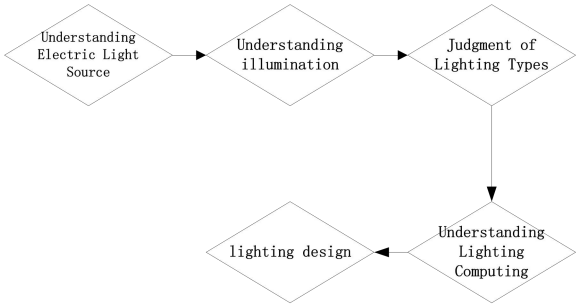
The teaching design and implementation process is shown in Figure 3. In this case, the student's actual engineering task is to design and arrange a lighting for a complex. The teaching design is divided into three aspects: pre-study, classroom teaching and after-school exercises. The whole process is driven by actual tasks, and through the video animation, micro-course, super-star learning, UMU interaction, Baidu cloud disk, WeChat, QQ and other information tools to complete the entire teaching task.

A. Pre-study

In this design case, in the pre-study session, the teacher publishes the content of the new lesson through information tools such as Superstar Learning and UMU Interaction. Students prepare the new lesson content through shared pictures, animations, courseware, web sites, and micro-courses.

B. Classroom teaching

According to the implementation process of the project, the teacher has already distributed the task of decomposition to the students in the preparatory process. In the classroom teaching session, the teacher leads the students to carry out the task together. The specific task implementation flow chart is shown in Figure 3.



Fiugre 3 The process of application

First of all, students need to know the common lighting electric light source. Students can learn the latest technology and new technology in the field of lighting according to the latest content provided by teachers on the information platform. Students need to understand the concept of illuminance, so this part mainly uses the derivation principle of the animation simulation formula, and then demonstrates. It is a place to attract students' interest points in judging the type of lighting, because there are various kinds of lighting methods in any building we are in. Lighting calculation is the key part of the final lighting design. This part uses video animation form to explain the application of each formula while demonstrating. At the same time, it shows the common methods of lighting design in the design institute in the industry.

In order to detect classroom learning and adjust the classroom atmosphere, teachers can pass Kahoot! Mobile APP field test. In the classroom, the teacher gives the test code through the big screen, and the student enters the test code into the test room. Teachers can specify rules for the test, and the content of the questions and options will only appear on the big screen. Students select answers on their phones based on the questions and options on the big screen. The teacher can instantly understand the student participation, completion speed and correct rate.

The last is the training phase. At present, the training equipment is still not perfect, the consumables are large, and the installation of strong electricity is dangerous. Therefore, computer simulation software is used to realize the lighting design task. For example, in Tianzheng Electric Software, students quickly calculate and design the number of lights and the number of lights used in the existing building plan, according to the room area and functional requirements. Even if there is a design error, the modification is very convenient. . It reflects the mission-driven concept and successfully integrates informationization and project-based teaching.

C. Homework

After-school exercises mainly include two parts: theoretical and practical training. The theoretical part is assessed by the online question bank. The practical training part is operated in Tianzheng electrical simulation software. If students have doubts after class, they can also use real-time questions such as Super Star Learning, UMU Interactive, WeChat, QQ, etc. Teachers can answer questions online in real time, which greatly improves the learning efficiency.

With the development of information technology, both the teacher and the teaching method are facing tremendous changes. This is the key to improving teachers' teaching ability and students' learning ability [5]. Only by constantly following the pace of development of the times and applying information technology can we better take students' development as the foundation, give full play to the subjective initiative of students, let students' minds and brains move together, and improve the overall teaching quality of the classroom. Informatization technology has made our teaching design more optimized, making our teaching methods more flexible, allowing students to learn more actively and positively, and allowing us to better cultivate the comprehensive application talents that the society needs.

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A Comprehensive Evaluation Model for Port Pilotage Risk based on DEA Analysis of AHP

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Abstract: The trend of large-scale shipping is becoming more and more obvious. In this context, pilotage safety is particularly important. To realize the choice of suitable ports is the key to avoid the risk of port pilotage. In this paper, the problem is analyzed and studied, aiming at the port selection problem of pilotage, a better choice scheme is proposed. The AHP method is used to combine the quantitative index with the qualitative index to get the risk evaluation model of port pilotage. The best DEA pilotage port can be obtained by the comprehensive analysis of the AHP and the quantitative index. To provide scientific decision-making support for the relevant management departments, and further enhance the safety of port pilotage.
Keywords: AHP; evaluation model; DEA; port pilotage

1. INTRODUCTION

The various control measures of the oven are to keep the temperature in the proper range. Due to the complex high-pressure and high-temperature characteristics of furnace smelting, it is almost impossible to directly measure the internal temperature through the instrument, and the two parameters that can evaluate the thermal characteristics in the furnace are the molten iron temperature and Si content [1]. For a long time, most studies have been based on the Si content to establish a furnace temperature prediction model, but the iron content of molten iron does not fully reflect the slope of the furnace temperature. In the metallurgical production process, the difference between the blast furnace capacity, the external environment and the proportioning conditions will cause different parameters of the smelting smelting. The differentiation of the prediction model will also cause different parameters, and the furnace temperature and the molten iron Si content are not closely related. The pig iron temperature is the most intuitive parameter to measure the temperature of the furnace. Therefore, this chapter takes the temperature of the furnace molten iron as the research object, and constructs the prediction model of the furnace molten iron temperature to predict it. And forecasting its future development direction, in order to propose adjustments in a timely manner, it plays an important role in maintaining stable production of smelting, reducing the occurrence of faults and improving the quality of pig iron [2-4].

With the development of science and technology, people's understanding of accidents in water transportation system is deepening, and the concept of safety management has made great progress. For the management and control of pilotage risk of ships in harbor, it has been shown that: from longitudinal single-point data statistics to horizontal composite data comprehensive analysis, the implementation of comprehensive system safety assessment [5-8]; from accident case analysis to event analysis, the implementation of accident mechanism and formation model of logical analysis; from accident response Emergency management is transformed into crisis prevention facing the future, and pre accident prediction and early warning are implemented. Therefore, it is meaningful to use scientific methods and means to comprehensively analyze the horizontal composite data and predict the corresponding risks.

At present, the evaluation of port pilotage risk is generally qualitative [7-10]. Therefore, this paper innovatively introduces AHP and DEA to quantitatively evaluate the risk of port pilotage, to provide scientific decision support for the relevant management departments and further improve the safety of port pilotage.

2. MODEL ESTABLISHMENT

2.1 AHP ANALYSIS

The core problem of AHP analysis is to combine qualitative analysis with quantitative analysis, and then change the limitations of previous optimization techniques to solve quantitative problems, to provide a new solution for dealing with qualitative events. Its core theory is to simplify complex system problems into orderly hierarchies and there is a certain dominant relationship between the layers. According to the criterion of the upper level, each level can compare the elements of the upper level two by two again, and then construct the judgment matrix, calculate the maximum eigenvalue and eigenvector, and get the weights of the elements of the upper level

relative to the criterion, and then get the comprehensive weights of the underlying factors to the target. This is an important basis for final decision making.

There are great differences in the degree of influence of port pilotage factors on its risk. Some factors are qualitative and some are quantitative. Therefore, the rationality of weight distribution directly affects the evaluation results. Using AHP method, crew, equipment, environment and management are taken as three indexes of the criterion layer to establish the risk assessment system of port pilotage and calculate their respective weights, as shown in Figure 1.

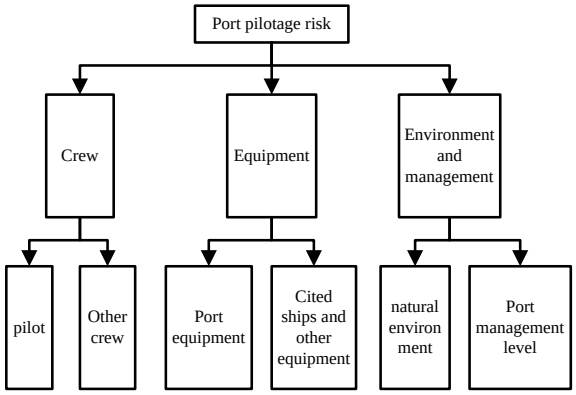

Figure 1 Evaluation System

1.2 DEA ANALYSIS

DEA (Date Envelopment Analysis) is a non-parametric method for evaluating the relative performance of decision-making units (DMUs) proposed by famous American operational research scientists A. Charnes and W. W. Cooper in 1978.

This method uses DEA model to get the corresponding production frontier, and this method is also a very useful and effective method to solve many input and output DMU problems. The purpose of this paper is to compare the comprehensive efficiency of two objects with the same nature by analyzing the risk and internal activities of port pilotage with CCR in DEA model.

Suppose there is n decision making unit (DMU). Each DMU has m input and n output. The input amount of $x_j = (x_{1j}, x_{2j}, \cdots, x_{mj})^T > 0$, $y_j = (y_{1j}, y_{2j}, \cdots, y_{sj})^T > 0$, $x_{ij} = DMU - j$ to i input and the output of $y_{rj} = DMU - j$ to i output $(j = 1,2,\cdots,n;\ i = 1,2,\cdots,m;\ r = 1,2,\cdots,s)$. For convenience of calculation, the input and output data corresponding to $DMU - j_0$ are $x_0 = x_{j0},\ y_0 = y_{j0},\ 1 \le j_0 \le n$, The DEA model of $DMU - j_0$ (fractional programming CCR model) is evaluated:

$$\begin{cases} \max \ \dfrac{u^T y_0}{v^T x_0} \\ \dfrac{u^T y_j}{v^T x_j} \le 1, \ \ j = 1,2,\cdots,n \\ u \ge 0, \ \ v \ge 0 \\ u \ne 0, \ \ v \ne 0 \end{cases} \tag{1}$$

$v = (v_1, v_2, \cdots v_m)^T,\ u = (u_1, u_2, \cdots, u_s)^T$ is the weight function of m input and n output respectively. In order to solve it conveniently, the equivalent linear programming model is obtained by Charnes-Cooper transform.

$$\begin{cases} \max \ \ E_k = \mu^T y_0 \\ \omega^T x_j - \mu^T y_j \ge 0, \ \ j = 1,2,\cdots,n \\ \omega^T x_0 = 1 \\ \omega \ge 0, \ \ \mu \ge 0 \end{cases} \tag{2}$$

The linear programming mode $\max E_k$ represents the comprehensive quality evaluation of the first pending port. If $\max E_k = 1$, then DMU is a weak DEA effective cell; if $\max E_k < 1$, DMU is DEA invalid cell.

The above linear programming is carried out for each candidate port, and a set of candidate ports with the highest comprehensive efficiency is finally determined.

3. CONCLUDING REMARKS

Based on DEA, considering the qualitative indicators of the port to be selected and the actual data in its operation, the comprehensive evaluation of the port indicators is carried out. As a method of port outsourcing selection, this model selection method can effectively avoid some shortcomings of AHP method and DEA method, such as when the weight value is close, it is difficult to determine the final object. Of course, AHP method is more vulnerable to the subjective influence of experts, and this method generally considers more qualitative indicators; while DEA method is just the opposite, this method for qualitative problems is less. Faced with these problems, the risk assessment model of DEA port pilotage based on AHP can just avoid the shortcomings of the two. By designing the connection cost, the model can avoid the disadvantage of local optimization, and the above selection method can reduce the computational complexity, so the model can well solve the problem of risk comprehensive evaluation.

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