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# CONTENTS

THE CONSTRUCTION SCHEME OF SMART URBAN OPEN SPACE SYSTEM....................................1

SQ TALENT TRAINING MODE BASED ON INFORMATION RETRIEVAL AND UTILIZATION COURSE......................................................................................................................................5

A QUALITY SOFTWARE SYSTEM DESIGNED FOR MENTAL DISEASE TREATMENT THROUGH ARTISTIC PAINTING........................................................................................................................9

RESEARCH AND PRACTICE OF PROJECT-DRIVEN TEACHING MODEL IN " VISUAL C ++ PROGRAMMING DESIGN" ......................................................................................................15

THE RESEARCH AND DEVELOPMENT OF BASKETBALL WEB-BASED COURESWARE .............19

STUDY ON MECHANISM OF COLLEGE ENGLISH TEACHERS OCCUPATION BURNOUT AND COUNTERMEASURES ............... -- BASED ON THE EMPIRICAL STUDY IN HANGZHOU HIGHER EDUCATION PARK ..........................................................................................................22

WHAT HAS NEVER EVER HAPPENED .............................................................................26

RESEARCH ON INDEX SYSTEM OPTIMIZATION OF “EVALUATING BY STUDENTS” BASED ON FUZZY COMPREHENSIVE EVALUATION METHOD ........................................................27

ANALYSIS OF INFLUENCE FACTORS ABOUT CONSUMER’S TRUST IN BABY MILK QUALITY AND SAFETY .........................................................................................................................31

STUDY ON RELATIONSHIP BETWEEN TRANSPORTATION HUB AND LAND DEVELOPMENT .35

CHINESE HI-TECH ENTERPRISE QUALIFICATION EXAMINATION AND ACCREDITATION THROUGH THE LENS OF FAIRNESS AND RECIPROCITY THEORY...................................41

RESEARCH ON THE INDEX SYSTEM CONSTRUCTION OF THE HARDWARE FACILITIES OF CULTURAL INDUSTRY PARK ASSESSMENT BASED ON AHP METHOD ..........................48

STUDY ON THE ENTIRE PROCESS OF SPORTS SPIRITS INTEGRATING INTO SCHOOL TALENTS CULTIVATING........................................................................................................55

BASED ON THE REFORM AND DEVELOPMENT OF CHINESE FOOTBALL POSITIONING AND OVERALL SCHEME OF FOOTBALL REFORM DEVELOPMENT THINKING ...........................59

RESEARCH FOR THE SUSTAINABLE DEVELOPMENT OF COLLEGES AND UNIVERSITIES AEROBICS..............................................................................................................................62

A STUDY ON MARX'S INHERITANCE AND DEVELOPMENT FOR HEGEL'S THINKING WAY ....64

BASED ON THE METHOD OF AHP IN THE EARTHQUAKE AND RESCUE COMMAND RESEARCH ...........................................................................................................................68

QUANTITATIVE ASSESSMENT OF THE INFLUENCE OF THE MARITIME SILK ROAD DEVELOPMENT STRATEGY TO THE ECONOMY OF CHINA BASED ON THE ANALYTIC HIERARCHY PROCESS.........................................................................................................75

COMPREHENSIVE EVALUATION AND EMPIRICAL ANALYSIS OF URBAN COMPETITIVENESS IN HEBEI PROVINCE ...........................................................................................................78

AN ANALYSIS ON THE STATES IN SOCIAL SITUATION OF GRADUATE SATISFACTION BY SPA ..............................................................................................................................................85

ANALYSIS ON THE CONNOTATION AND IMAGINAL GROWING POINTS OF RUBBER-BAND SKIPPING BALLADS..............................................................................................................90

**STUDY ON THE INFLUENCE OF MONTESSORI EDUCATIONAL THEORY ON THE PHYSICAL EDUCATION IN CHINESE SCHOOLS ........................................................................ 96**

**APPLICATION OF THE INTERNET TO ASSIST ENGLISH LEARNING -- AN INVESTIGATION TO THE STUDENTS OF 2006 IN SPORTS AND ART COLLEGE OF TIANJIN SPORTS UNIVERSITY .. 99**

**BLENDED LEARNING MODEL BASED ON MOBILE INTELLIGENT TERMINALS ........................ 104**

**THE COMBINATION OF CHINESE TRADITIONAL CULTURE AND MODERN TEACHING RULE ........................................................................................................................ 107**

**RESEARCH ON THE ENVIRONMENT OF MODERN EDUCATIONAL TECHNOLOGY OF PHYSICAL EDUCATION IN COLLEGES AND UNIVERSITIES OF HUNAN PROVINCE ................ 110**

**RESEARCH ON THE MODERN EDUCATIONAL TECHNOLOGY IN PHYSICAL EDUCATION USED BY TEACHERS OF COLLEGES AND UNIVERSITIES OF HUNAN ........................................... 114**

# The Construction Scheme of Smart Urban Open Space System

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Abstract: Smart city is a hot spot in current China's urban construction. The smart urban open space system will play an important role in construction and planning of smart city. Based on the structure of urban open space system and its smart functional requirements, the paper establishes a construction framework of smart urban open space system. In this framework, the smart urban open space system is divided into eight layers: user layer, application layer, service layer, processing layer, data layer, layout layer, infrastructure layer and information layer. The service layer is the core of the whole framework. It is divided into five modules: smart travel module, smart activity module, smart management module, smart warning module and smart planning module. The paper discusses the construction scheme of the service layer in detail. Through the application of smart technology to urban open space system, it can provide ideas for future smart city construction, and improve the quality of its construction.

Keywords: Smart City, Open Space System, Construction, Urban.

## 1. INTRODUCTION

After nearly thirty years of rapid urbanization, China's urban construction needs transformation and upgrade. Smart city is the main objective of this transformation. Rapid urbanization creates new challenges and issues, and the smart city concept offers opportunities to rise to these challenges, solve urban problems and provide citizens with a better living environment[1]. On the one hand, the construction of smart city can help the city achieve smart growth through the latest technology with limited resources; On the other hand, the construction of smart city is reflected in the public's demand for modern life.

The urban open space system is the main position of smart city construction. Since IBM proposed the concept of "Smart City" in 2008, an upsurge of "Smart Construction" has risen around the world[2]. During the past ten years, city space system has become more digital and information-based, and there has been a fundamental change in the living environment of citizens and the governing mode of cities. Many studies point out that the optimization of urban open space system is an important way that strengthens the modern city construction, and to sustainable urban development[3]. The urban open space system is a collection of various open spaces with combination of elements, structure and function. It has practical function, ecological function, cultural function, landscape function and regulation function[4]. It is also an important carrier of public activities. The important task of smart city construction is to build a smart urban open space system.

The elements of the urban open space system include not only the park and the square in the narrow sense, but also the non-architectural space in the broad sense, such as the street, the river and so on. According to the space characteristics, the urban open space system can be divided into three subsystems: green open space system, gray open space system and blue open space system. According to the spatial form, the elements of each subsystem can be divided into three categories: point, line, area. This system is the spatial basis for its smart infrastructure layout (Fig.1.).

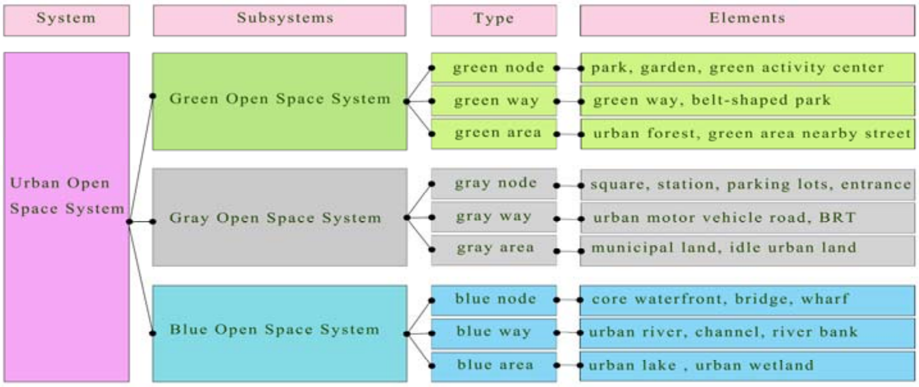
System
Subsystems
Type
Elements
Urban Open Space System
Green Open Space System
green node
park, garden, green activity center
green way
green way, belt-shaped park
green area
urban forest, green area nearby street
Gray Open Space System
gray node
square, station, parking lots, entrance
gray way
urban motor vehicle road, BRT
gray area
municipal land, idle urban land
Blue Open Space System
blue node
core waterfront, bridge, wharf
blue way
urban river, channel, river bank
blue area
urban lake , urban wetland

Figure 1. The Urban Open Space System and its Subsystems

The concept smart means to be able to self-adapt and provide customized interfaces and services to user requirements. The construction of smart urban open space system should also pay attention to its functional requirements. The functional service is the core of the smart urban open space system. It is not only for the public, but also for managers and planners. The construction of smart urban open space system is a new issue with no existing examples; therefore, the scheme of this paper is a very meaningful exploration.

## 2. METHOD

Smart open space system needs all kinds of information, and provides as much smart service as possible. Based on the element type of the open space system, multiple sensors and information transmitting and receiving facilities are arranged. It integrates the most advanced technologies like Internet of things, big-data technology, cloud computing, geographic information technology, remote sensing technology, etc. This paper establishes a construction framework of smart urban open space system(Fig.2.). It includes all aspects of the smart urban open space system.

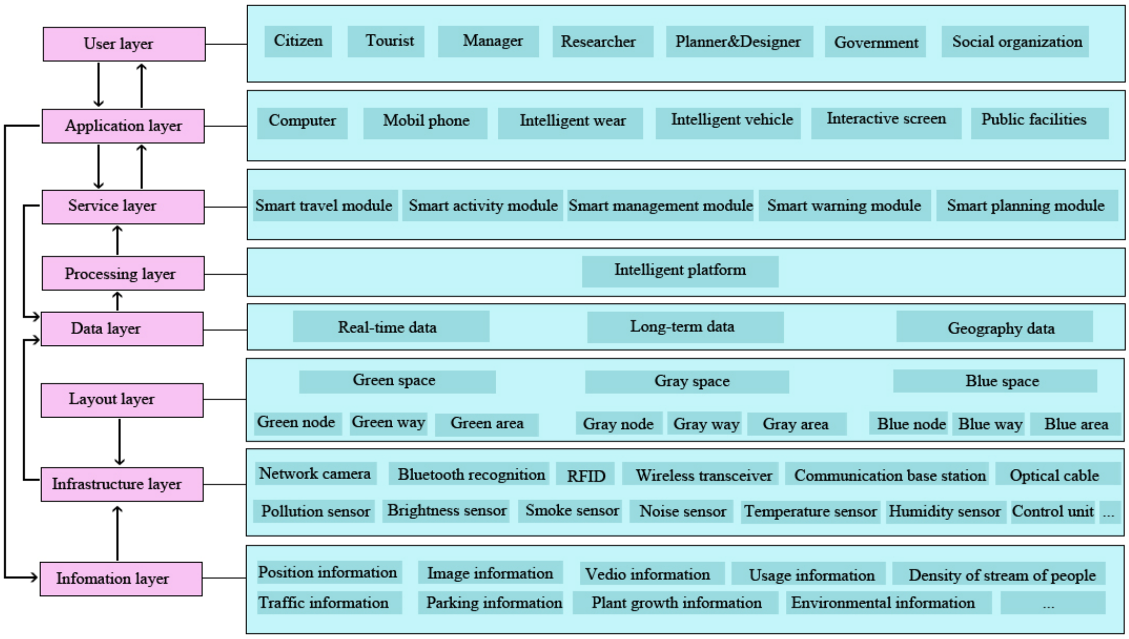
User layer
Citizen
Tourist
Manager
Researcher
Planner&Designer
Government
Social organization
Application layer
Computer
Mobil phone
Intelligent wear
Intelligent vehicle
Interactive screen
Public facilities
Service layer
Smart travel module
Smart activity module
Smart management module
Smart warning module
Smart planning module
Processing layer
Intelligent platform
Data layer
Real-time data
Long-term data
Geography data
Layout layer
Green space
Gray space
Blue space
Green node
Green way
Green area
Gray node
Gray way
Gray area
Blue node
Blue way
Blue area
Infrastructure layer
Network camera
Bluetooth recognition
RFID
Wireless transceiver
Communication base station
Optical cable
Pollution sensor
Brightness sensor
Smoke sensor
Noise sensor
Temperature sensor
Humidity sensor
Control unit
...
Infomation layer
Position information
Image information
Vedio information
Usage information
Density of stream of people
Traffic information
Parking information
Plant growth information
Environmental information
...

Figure 2. The Framework of Smart Urban Open Space System

The framework of the smart urban open space system is divided into 8 layers: user layer, application layer, service layer, processing layer, data layer, layout layer, infrastructure layer and information layer. User layer mainly refers to all types of the clients, including local citizens, tourists, managers, researchers, planners, designers, governments and other social organization. These users are service objects and also part of the source of information. Through the application layer of a variety of devices, they obtain and issue a variety of information resources. The application layer contains a variety of tools used by the users. They are computer, mobile phone, smart wear, intelligent vehicle, interactive screen and public facilities in open space. The service layer is divided into 5 modules: smart travel module, smart activity module, smart management module, smart warning module and smart planning module. These service modules rely on the results provided by the processing layer that is an intelligent platform. These raw data are obtained from the infrastructure of the layout layer which is classified according to the space characteristics. In this way, a wide range of sensors and technical equipment can be arranged in an orderly way. The technology and research of smart sensor is developing rapidly. The infrastructure layer contains network camera, bluetooth recognition, RFID, wireless transceiver, communication base station, pollution sensor, brightness sensor, smoke sensor, noise sensor, optical cable, control unit and so on [5][6]. These infrastructures can collect a variety of information from the environment and human being， such as position information, image information, video information, usage information, density of stream of people, traffic information, parking information, plant growth information and other environmental information.

## 3. RESULTS AND DISCUSSION

The service layer is the core of the smart urban open space system. In this layer, each module contains many contents. These contents reflect the smart functional requirements (Fig.3.).

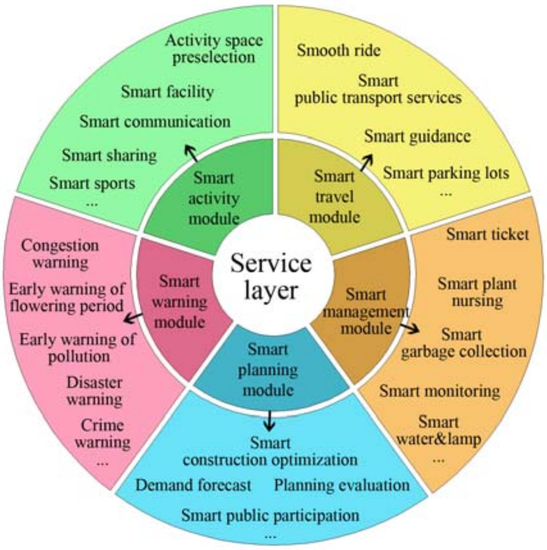
Service layer
Smart activity module
Activity space preselection
Smart facility
Smart communication
Smart sharing
Smart sports
...
Smart travel module
Smooth ride
Smart public transport services
Smart guidance
Smart parking lots
...
Smart management module
Smart ticket
Smart plant nursing
Smart garbage collection
Smart monitoring
Smart water&lamp
...
Smart planning module
Smart construction optimization
Demand forecast
Planning evaluation
Smart public participation
...
Smart warning module
Congestion warning
Early warning of flowering period
Early warning of pollution
Disaster warning
Crime warning
...

Figure 3. The Service layer modules and their contents

### 3.1. SMART TRAVEL MODULE

Smart travel module is the guarantee of perfect operation of smart urban open space system. Intelligent wear and smart vehicle equipment provide the specific location and density of people and vehicles. Urban residents or visitors can go to each open space at any time, and choose the best route and traffic tools. The real-time traffic notification and guidance services ensure people smooth ride on green bicycle way. Buses and taxis are automatically adjusted according to the sate of traffic in the system. Under the guidance of the smart vehicle equipment, private cars avoid crowded sections and choose smart parking lots.

### 3.2. SMART ACTIVITY MODULE

The smart activity module is mainly for those who remain in the field or who will be active. The service of smart activity module includes activity space pre-selection, smart facility, smart communication, smart sharing, smart sports and so on. Users can choose the open active space in advance, and receive the proposal of the system. Smart facility service relies on ancillary facilities surrounding the activity site. They have touch screens and contact the intelligent platform. The smart communication service supports WIFI, NFC, Bluetooth and other communication technologies, it ensures the people's modern communication in the field. The smart sharing service allows people to quickly search for shared images and evaluation of the space where they are located. These sharing information is connected to social networking sites and applications in the system. According to the sharing information，people can make friends with others who have the same interests. The smart sports service can record the activities of the trajectory for a single user or a group, It provides sports scheme in accordance with users' habits and hobbies.

### 3.3. SMART MANAGEMENT MODULE

Smart management module helps not only managers but also park visitors. Its service includes smart ticket, smart plant nursing, smart garbage collection, smart monitoring, smart water, smart lamp and so on. Smart ticket allows the park ticket that can be electronic on the phone.Through the two-dimensional code scanning, NFC, this service makes visitors more convenient. Smart plant nursing service allows managers to accurately manage the ornamental plants in the open space and avoid unnecessary labor and water consumption. Based on the filling of the garbage, smart garbage collection service can remind the management staff. Smart monitoring ensures the safety management of open space. Managers can receive obvious changes of images and videos in a timely manner. The smart water service together with the rain garden makes the rain water be stored and recycled. The smart lamp can adjust brightness and its time according to ambient light, sound and crowd.

### 3.4. SMART WARNING MODULE

Smart warning module includes 5 services: congestion warning, early warning of flowering period, early warning of pollution, disaster warning, crime warning. The congestion warning module can prevent traffic accident and trample. It predicts traffic trends in advance in line with real-time data and issues a warning to all terminals. Early warning of flowering period module predicts different flowering stages in the park according to the photos, temperature and other information. Therefore, people plan ahead of schedule and watch the time. The module provides a preview of the tour time. And it can warn the people who are allergic to pollen to be ready to face masks. Early warning of pollution is, through a variety of sensors on the air, water, smoke, noise monitoring, to remind people not to enter and to inform the management to take measures. Disaster warning service is based on long-term big data to calculate and analyze the possible of meteorological disasters, traffic disasters, fires, floods and other disasters. Crime warning service is combined with GIS to make urban open space crime map, to help the police find out the law of outdoor crime and dangerous space.

### 3.5. SMART PLANNING MODULE

Smart planning module is mainly for planners and government policy makers. It certainly provides part of the public participation. Its service mainly includes smart construction optimization, demand forecast, planning evaluation and smart public participation. These are generally based on the big data from open space system users. Smart construction optimization service helps planner adjust the urban open space system planning in time by way of the situation of the public usage. Based on similar areas of population activities and traffic, demand forecast service predicts the demand of new open space. To establish models with the existing big data, planning evaluation service could compare the different planning schemes and select the optimal schemes. The smart public participation service allows public to assess the local open space at any time. And it calculates the weight of each user's opinion according to their usage frequency.

## 4. CONCLUSIONS

Smart urban open space system is to use the smart technology to meet the needs of the public, to build the smart urban services. The development of smart open space system should introduce the latest technology and be updated constantly. In the future, the smart urban open space system can not only make urban residents live in a more convenient way, but also make the urban management and service fine, automatic. It can analyze the problems of urban management and service, and provide decision support service for smart city development.

## 5. ACKNOWLEDGMENT

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# SQ Talent Training Mode Based on Information Retrieval and Utilization Course

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Abstract: in the information era of Web2.0, search-quotient talents are the scarcest capability. If you want to improve the success probability and the life quotient in nowadays when the economy and information develop fast. As for the college student in the information era, information retrieval is the way to improve their search quotient. This paper starts from the basic theory of search quotient, through the analysis of the current situation and the practical conditions of college students, analyzes the ways to improve the search awareness of college students and the ways of training search-quotient talents.

Key words: Information retrieval; Talent training; Search quotient; The library at college

## 1. PREFACE

Search quotient appears in the era of search engines, proficiency in search tools has become the prerequisites to succeed in career, and the search-quotient talents are the scarcest people in the all walks of the society. College and universities are the good place to train the talents, according to the statistics of all big database, the research results about search quotient are most from libraries of the higher education institutions, which is closely associated with the Information Retrieval and Utilization opened by the libraries. The course is aimed to train students' information quotient and has a certain intersection with search quotient. The effective implementation of the course is the best way to improve college students' search quotient and libraries has the unparalleled advantage in cultivating search-quotient talents.

## 2. RESEARCH STATUS OF SEARCH THEORY

Search quotient is the third kind of ability different from IQ and EQ and emerged in the network era when the Internet developed fast, and the level of SQ determines people's ability to use network information and the survive in the information era. The researches about SQ has three different points of view, they are Huang Taishan's Search Awareness, Chen Pei's Search Efficiency and Yu Xinguo's 6 elements of SQ, which are the three stages of SQ research.

### 2.1 SEARCH THEORY AND FORMULAE OF HUANG TAISHAN

International marketing expert Mr. Huang Taishan proposed the concept of search quotient in 2005 and late gave the formula of SQ related to IQ and EQ: Search quotient = search consciousness * IQ * EQ, namely SQ=M (s) * IQ * EQ, among which SQ is search quotient, M(s) is mind(sourcing), IQ is Intelligence Quotient, EQ is emotional quotient. From the formula, we can see that , SQ has a proportional relationship with EQ and IQ. He believes the core of SQ is mind(sourcing) and search ability. His years' marketing search experience told us that the three core strategies are decomposition search, theme search and cross-field search, which is the core difference between SQ and search skills[1].

### 2.2 CHEN PEI'S SEARCH THEORY AND THE FORMULA

Chen Pei, President and CEO of ZhongSou, as an advocate of the third generation search engine, he has been working in the innovation of the Internet. In 2006, he pointed out that SQ is another ability different from IQ and EQ, is the third ability of human kind and raised the formula that is different from Taishan Hwang's: Search quotient = (knowledge/time) * search index, namely SQ= (K / T) * C. The SQ is search quotient, K is the obtained knowledge, T is the time to obtain the knowledge, C is the search index (social average knowledge acquisition ability). From the T in the formula, Chen Pei's Search quotient theory stresses the ability to acquire knowledge in a short period of time, which is the most concerned issue efficiency. He believes search quotient is an ability that people use tools to acquire knowledge, and acquisition ability is more important than the acquired knowledge[2]. He also focuses on the analysis of the complementary relationship among SQ, IQ and EQ, and the three together decide people's success and failure, Success = IQ+SQ+EQ.

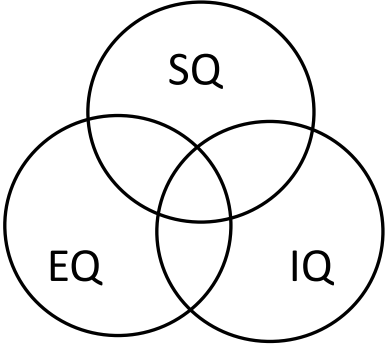

Figure 1, the complementary relationship in IQ, EQ and SQ(Note: IQ is Intelligent Quotient, EQ is Emotional Quotient, SQ is Search Qaulity)

### 2.3 YU XINGUO'S SQ THOERY AND THE FORMULA

Yu Xinguo, the Associate Researcher of Guangzhou Huali Science and Technology Vocational College made further supplement and addition based on the theory of Huang Taishan and Chen Pei in 2015. He borrowed the mind in Huang Taishan's theory and search time and index in the Chen Pei's, added three elements directly related to SQ, namely search ability, search process and search result. He re-defined the SQ is the comprehensive SQ and IQ of the search ability, search process, search process and search result in a certain search time and social average SQ index, the formula is SQ= search awareness+ search capability +search process and search result/(search time*search quotient index) namely SQ=（SA+SC+SP+SR）/（ST× SSI）. SQ is search quotient, SA is search awareness, SC is search capability, SP is search process, SR is search result and SSI is search quotient index. The unite of SQ elements are taken as level beside the time is hours[3]. The new level of search criteria is determined by six factors, we cannot just look at one single of the various factors.

## 3 THE RESEARCH SITUATION OF SQ CONDITION OF COLLEGE STUDENTS

### 3.1 THE RESEARCH SITUATION OF SQ IN RECENT YEARS

It has been 11 years since Huang Taishan proposed the SQ in 2005. In the years, especially in 2010（Fig.2）, there were the most research results, and the study in recent years shows a decline trend, but never stopped. The in-depth researches in SQ was counted in Yu Xinguo's 《The SQ Six Element Formula and the Related Researches》. From the proposal to the first half year of 2015, in some important academic journals, there were 46 article about SQ. He thought the data has showed that SQ has been drew the attention of the academic circle, the strength and the depth are inadequate, so it is necessary to enhance the research of SQ theories and practices[4].

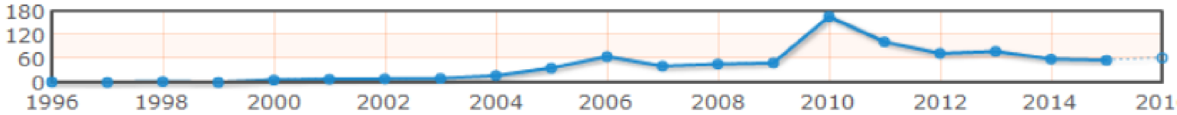

Figure 2, the Statistics of published papers about SQ[5]

### 3.2 THE PRACTICAL CONDITION OF COLLEGE STUDENTS' SQ

As the network rises, transmission mode of information is more and more abundant, especially after the emergence of Web2.0, the amount of information has the geometric progression growth, which raises higher requirements for college students. They need to learn the search tools, distinguish, evaluate and process the obtained information, more important, they should have the search awareness. Only some college student can reach the level, due to different knowledge amount of the students, which have different requirement on information, so their search capabilities are even. According to the author's teaching experiences, their capabilities can be grouped into three levels.

The college students with the first level have a higher sense of search, and they can use search to solve problem. Generally, they are the research-type talents and can undertake research projects, like the college student innovation projects. They are good at using tools to study and have a certain learning ability and are proficient in using digital resources of the colleges, but in the facing of massive information, they have less experience in evaluation and identification of information, and they are lack of the integrity of search results and their capabilities need improvement.

The college students with the second level have general search awareness. When they cannot solve a problem, they will search online on Baidu, and they don't know the related materials with academic value and copyrights are in different databases. They can't use search tools to learn and are lack of certain learning ability, but they had good search capabilities in entertainment and life. Such as shopping websites, movie videos, travel plans and so on. They clearly know that which website can better meet their needs.

The college students with the third level have poor awareness of the search, they won't think of search online and ask for helps. In addition to classroom, they hang around on the Internet, shopping, playing game and QQ or WeChat and so on. Every day is cool. Among them, a majority of people will not know what is China Cnki, and even some people never go to the school library. So, these students need to improve search awareness, cultivate their SQ, playing the survival foundation for the future social life.

## 4 THE IMPORTANCE OF SQ TALENT CULTIVATION IN THE ERA OF INFORMATION

### 4.1 IT IS THE REQUIREMENT OF INTERNET ERA TO TRAIN SQ TALENTS

In the past, the well-educated people of Confucianism and Taoism always thought there were no books to read. In the modern time, the sharp increase in books and network information that people cannot digest all the information, so the massive and countless information, what we only can do is to use Internet and improve our search awareness, fully use search tools, find the search channels, improve search capability and find the required information when it is necessary. In that way, we can deal with the shock brought by the flood of information. In the internet era, we have no choice and only improving our SQ, so we can sail smoothly in the sea of information. So, SQ talents training is the requirement that the era gives to us.

### 3.2 IMPROVING SQ IS THE NECESSARY REQUIREMENTS FOR COLLEGE STUDENTS TO TAKE THE CHALLENGES IN THE FUTURE

The most urgent problem for contemporary college students is the employment. In the era of information, it doesn't mean that your excellent academic performance can lead others, employers more care how candidates deal with information in addition to their performances. Who can bring more profits to enterprises will succeed and the rest people only can suffer the pain. So, if college students want to stand out in competition, they use depend on their SQ. There is an old saying that sharp tool makes good work. The tool of college students is SQ, which is the inevitable demand for college students to take the challenges in the future.

## 5 METHODS AND WAYS OF TRAIN SQ TALENTS

### 5.1 IMPROVE COLLEGE STUDENTS' SEARCH AWARENESS

The fierce social competitions not only bring opportunities to the contemporary college students, but also give them some facing severe challenges. If they want to adapt the rapidly changing industry situation, they must accumulate knowledge, update the knowledge, and train their innovation in order to improve their competitiveness in their future career, which need them to have the higher information retrieval awareness, strong information retrieval capability and good information quality. It should let them fully realize that SQ is the basic ability for current college students, only having higher information thoughts, strong information awareness and mastering the correct information obtaining method, they can adapt the development trend of future information society in the oncoming work and study[6].

In order to improve the students' SQ consciousness, in addition to the basic publicity, we can let the college student party members play the vanguard and exemplary role, invite information retrieval teacher to give them the trainings in search consciousness, and search method and search capability so as to improve the level of their SQ because party members are from all departments of each class. Therefore, the party members can train the students' search awareness, which can expand the promotion level and help the college students achieve the goal to improve their SQ level on purpose.

### 5.2 STRENGTHEN THE INFORMATION RETRIEVAL COURSE CONSTRUCTION

Information retrieval course is taken in libraries on the basis of abundant collection materials, which can let students to choose freely in the sea of knowledge and expand or perfect their knowledge structure. The course should be taught gradually and is adjusted continuously. First, it should improve the teaching method, use the mode of combination of teaching and practicing, and improve their sensitivity to capture the useful information in massive information. Students find and solve problems in the search results. The teacher should check whether the initial analysis is right, whether the middle retrieval strategy is proper, and whether the later research is effective in order to follow the whole process and master the situations of students, and correct timely if have problems, Second, the content should be forward-looking and pay attention to the new changes and new development of network information. Information retrieval is to train students' self-learning ability and research ability, ask them to master the recall and precision, the reliability of information screening, strictly abide by the standard of morality in information, avoid the information disputes and other events in the course of the study. Information retrieval course not only provide the guidance of the theory and method for student to obtain the required information and teach them the methods to collect, process and use information materials, which can help students feel comfortable in the future employment, improve the work efficiency and become the leaders in their industries[7].

### 5.3 HOLD INFORMATION RETRIEVAL CONTEST

Through the competitions, the students can recognize the level of SQ and the improvement can be obtained in search practices. The competition mode in a certain extent to cater to the needs of students and will cause the student's attentions. Before the official contest, the simple training can achieve the goal to promote SQ. Through the selection in several rounds, students can understand the importance of information search for the future of life. The competition provides the important basis for the college to understand the SQ level of students.

In order to strengthen the effect of the competition, School Press Association assists and is in charge of the shooting and reporting the final contest. We should let the whole activity have a wide influence, not limit to a department, and make ordinary students know it and let them discuss after class. making them after class topic. Secondly, we will also publicize it through leaflets, posters, banners and other conventional channels and holding other activities in the relevant units to strengthen the publicity of information retrieval contest.

### 5.4 BOOK RECOMMENDATION ON RAPIDLY IMPROVING SQ

(1) 《SQ:PEOPLE' S THIRD ABILITY》

The Present and CEO of ZhongSou, Chen Pei, 《SQ: People's Third ability》 published by Tsinghua University Press in 2006. This is the first book that put forward the concept of SQ and this is an important book in SQ field. The book can help us understand what is SQ, what are the functions, and what is the role of SQ in modern life. The theory is not boring, full of interesting stories, and the book can help us improve SQ and rapidly obtain the success indicator.

（2）《MY SQ IDEAS ARE MORE THAN YOURS》

Mr. Huang Taishan, the International marketing master, the training consultant of a number of export companies, accumulated a lot of experiences in searching in this 10 years of export marketing experience and updated the practical experience to the level of theory. In 2014, Peking University Press published his book《My SQ Ideas are more than yours》. Through a lot of cases, the book demonstrates the application of SQ in modern marketing. The author often searched a variety of clients, suppliers, talents, training materials and had the abundant experience in searching and came up with the concept of SQ in 2005. This book teach people how to search information when they are facing the search problems.

## 6. CONCLUSION

In the face of the massive information, no matter how smart you are, even you have a good memory, you cannot master all information. Only having the method to gain the useful information can brace the challenges in the era of information. The SQ talents are very important. Therefore, the information retrieval course of colleges train students SQ capability, which is the urgent issue for student to survive in the era as well as their paths to realize the lifelong learning[8].

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# A Quality Software System Designed for Mental Disease Treatment through Artistic Painting

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Abstract: Mental illness belongs to emotional disease. Medication and psychotherapy have good effectiveness but cannot last long due to side effects of drugs and resistance of patients respectively. The study found that artistic paintings may supply treatment of mental illness: (1) The use of aesthetic rules cured many patients; and (2) The expression and function of catharsis of painting can reveal the patient's unconscious and provide physicians with accurate treatment. Computer graphics in the field of painting therapy has a broad application. Computer software is helpful to improve the quality of painting, and can simulate reality and set up a counseling system. Palette should set up some more curve tool in software, curve conforms to the psychological characteristics of the complex human, and it gives patients' full of humanistic care. On the palette should try to avoid black, gray and purple. Reading famous painting can significantly improve the patients' state of mind, but with positive themes for pointcuts. Figurative painting and strong sense of order easily gives patients a sense of reality and certainty, and marks the boundaries with potential illness of mental.

Keywords: aesthetic law; catharsis; sub-consciousness; computer graphics tools; famous paintings

## 1. INTRODUCTION

Nowadays, overload working pressure makes people easily suffer symptoms such as anxiety and mental depression, ranging from anorexia, tinnitus and dizziness to mental disorder and sickness. According to statistic data of WHO, there are 1.5 billion mental disease patients around the world, including 400 million anxiety neurosis sufferers, 340 million depression sufferers and 240 million personality disorder sufferers. For example, in China, the number of patients of various mental abnormalities has exceeded 83 million. Especially, mental diseases like depression, anxiety and obsession are more frequently seen. Among diversified mental diseases, depression has the highest mortality. Depression, a kind of mental pressure illness, contains mild irritation, vexation, pessimism, desperation, pain and even an idea of suicide. It is expected that depression will become the second-largest disease second only to heart disease in 2020 [1].

## 2. AN INTERPRETATION OF MENTAL DISEASE FROM CHINESE-MEDICINE PERSPECTIVE AND THE THERAPEUTIC SCHEDULE

Mental disease is mainly manifested by durative mood-disorder symptoms and belongs to emotional illness in Chinese medicine. Schemes of treating mental diseases include medication, psychotherapy and a combination of the two. Medication causes different-degree side effects and thus makes patients have difficulty in adhering to it. Psychotherapy, which has good effects, requires patients to possess a certain ability of comprehension and realisation and can endure pains resulting from various symptoms during treatment, so patients can easily form resistance to psychotherapy. In 1830s, a group of American artists taught psychotics to draw pictures at a mental hospital. These psychotics were later found to present a considerate improvement in their conditions. Since 1930, psychology masters such as Freud and Jung recorded psychotics' dreamlands by means of drawing. Psychiatrist Naumburg tried to use artistic expression as a treatment mode. In 1950s, Naumburg began to offer Art Therapy related courses at Art Education Department of New York University and art became a basic therapeutic means [2]. Drawing therapy, which integrates painting art with psychotherapy, is not only an artistic expression and execution of psychology but also a psychological application of painting art [3]. With significant effectiveness, it is very popular with physicians.

## 3. PAINTING CURING AND COURSE OF TREATMENT OF MENTAL ILLNESS

### 3.1.Control and Adjustment of Atheistic Law

Pictures exist in every aspect of human life and people's eyes constantly accept and look for various prospects, and therefore influences of pictures on people's mind should not be neglected. In the middle of 20th century, allergy physician Randolph from Chicago, USA was firstly dedicated to investigating relationship between pathogenesis and environment. He found many environmental pathogenic factors. Besides air pollution, water and soil pollution and ocean pollution, visual pollution is a visible and appreciable visual environment easily causing mental diseases; it mainly refers to shape pollution, colour pollution and light pollution. According to some calculations, disharmonious colours can reduce productivity by 1% [4]. It results in not only incoordination of nervous system, temperature, heart rate and blood pressure but also symptoms like dizziness, fret, anorexia, impaired concentration, weakness and insomnia. Pictures, patterns, marks and colours can all be viewed by eyes as specified imagination information. After being delivered to brain, imagination information can induce consciousness and emotion or even affect connection between brain and various parts of the body [5].

People find: drawing endow pictures with rich meanings and have positive psychological hints, and thus make anxiety neurosis cured without treatment. During the reign of Chinese Emperor Tai Zong of the Tang Dynasty, the emperor always dreamt devil pushed the door. Generals Qin Qiong and Yu Chi Gong actively helped the emperor and guarded the door for three consecutive nights. Finally, Tai Zong's nightmare disappeared but he could not bear to have these two generals conduct night watch. Therefore, he asked painter to draw images of them and paste the pictures on the door and was cured automatically soon. In modern times, Frenchmen's researches demonstrated workers who often appeared at funeral parlor or dead house mostly had neurosis or digestive system disease. Subsequently, a pale-green idyllic-landscape picture was drawn on the wall of funeral parlor. Several months later, workers' spiritual state gradually improved and production efficiency increased.

### 3.2. Function of Catharsis and Revealing Unconscious

First of all, process of drawing is a kind of expression and catharsis. Philosopher Spinoza once said: "without emotion induced by oil painting, sculpture, music, poem and various natural beauties, pleasures of life will be reduced by half and a gate will be opened to diversified diseases". Drawing cannot only eliminate loneliness, take out anger, release stress and enhance self-management ability but also bring about physical and mental pleasure. Albert Einstein said: "if you want your children to be clever, gave him a story. If you want him to have wisdom, give him more stories", Famous education experts Xiaowu emphasis on children to draw the story with the picture, is one of the methods for training children smarter. Painting is a light physical labour; with pen as weapon, painters release their mood and express their thoughts through friction of pen and paper. Van Gogh used the brush to vent his anger by rapidly spinning cloud, twisted cypress, glaring light, etc. Picasso's "Guernica" is accusing German atrocities and the evils of the war by people dying in the war. During the New Culture Movement in China, Lu Xun was a revolutionary pioneer in advocating woodblock print and made the greatest contribution. He spoke well of Kathe Kollwitz's prints as "using profound maternal love to express sorrow, protest, anger and struggle for all insulted and harmed people" [6]. Lu Xun emphasized heavily propagandistic and expressive functions of print and advocated utilising print as a tool for political propaganda.

Secondly, drawing can reveal patients' sub-consciousness. In daily life, people's internal sticking point is always restrained in sub-consciousness. Drawing can transcend language and properly communicate people's sub-consciousness. According to textual research, subconscious thinking activities are the most active during drawing or dreaming. Wang Xizhi's "Preface to the Orchid Pavilion Collection" was completed with brush pen and silkworm cocoon paper when this great calligrapher was half intoxicated during drinking game. However, after regaining consciousness, he could not write down "the best Xing calligraphy" again. Such examples are too many to enumerate. Some patients prefer to use cool colours such as black, grey to fill the whole picture, to reflect the mood of being depressed. Some patients will not change colour, which shows a quiet and solitary personality. Many painters use subconscious memory as materials of drawing. For instance, Spanish painter Salvador Dali is an extraordinary talent famous for exploring subconscious image and dreamland. All dreamlands drawn by him juxtapose, distort or deform ordinary images by strange and unreasonable means [7]. Soon after Dali's death, some researchers found Dali was a real psychotic and his works were sufficient evidences. Psychotic's status is as below: shattered personality, collapsed consciousness, recession from living condition to animal's state, gradually-fading human nature, and revivification of animal nature [8]. Their spiritual world is governed by sub-consciousness. Drawing can accurately reflect patient's sub-consciousness. In European and American countries, psychiatrists normally have a certain ability of picture drawing and reading (physician must hold a master degree of Fine Arts). During drawing therapy, physicians can induce patients to draw their inward thoughts, regardless of quality of the picture. It is important that process of painting improves patients' psychological environment. Physicians should pay attention to observe the patient is interest in which step. If the patient likes cooler mixing, it means that he/she has a pleasant life experience during this process. In a word, physicians cannot impose conceptions on patients conventionally and should make patients participate in actively. Patient's drawing process is closely related with sub-consciousness. Physicians will see patients' sticking points in sub-consciousness during reading their painting works. Then, physicians can begin to carry out psychological direction accurately.

### 3.3. Painting Therapy Process in Treatment of Mental Diseases

The first country to use painting treatment could be arguably China. As early as in ancient times, people in used painting and other art forms to record important events in life, society and inner thoughts. According to history records, in the Northern and Southern Dynasty, Province Yang king was killed in the war. The princess was very sad and had a bad illness, on which medication did not have any effect. Princess's elder brother was very worried about her, he thought: "The disease must be curable by mental medicine", and therefore he invited painter, Yinqian, to draw a portrait for Province Yang hoping to commemorate him. But YinQian did not do as requested, he drew a picture of Province Yang king and the maids being "flirting" each other. The princess saw the picture and got very angery, and shouted “he should die early”!

Receiving hatred instead of love, the princess was gradually free from thoughts. Soon, the disease was cured. In the Sui Dynasty, Emperor Yangdi, Yang Guang, got a disease called "thirst". Painters drew a picture for him entitled "the plum in the snow". Yang Guang produced saliva in the mouth when he saw the picture, he did not feel thirsty any more, and the disease gradually disappeared. In the Song dynasty, there was a writer called Qin Guan, who once had gastrointestinal problems, a friend brought him a landscape painting and told him: "see the painting, your disease will be good". As expected, Qin Guan was attracted by the scene in the painting, he felt that he had left the bed and walked into the picture, and he was soon recovered.

The above are true stories of the historical record. In China, the scientific use of painting therapy history is not very long. Beginning from 1992, many people started the painting therapy and the research of evaluation technology. Hanlun Li, in his master’s thesis, put forward a proposal to treat the mood disorders in children in 2003. Xiongwei Li reported a case study that the painting therapy correcting stuttering phenomenon. In 2002, Chen Kan of South China Normal University set up logistic regression diagnosis equation from drawing characteristics of HTP (house, tree, and people) to neurosis. Diagnostic tool of mental health used by him is SCL-go and house-tree-people drawing technique [9]. At present, this technology has been widely used.

In other countries, painting therapy technology was also being gradually introduced. Neuroscientist Firth and artist Law discovered painting activated brain region related with object identification and object position. In 1987, psychologist Rhyne adopted drawing for applying mental intervention to three women with obesity and three women with loss of appetite; Results showed five of them had obvious enhancement in self-respect. In 1997, Backos used drawing therapy to treat raped females’ trauma experiences and found they were improved in self-image and self-satisfaction. Practice has proved that painting therapy has been recognised in the world, and has grown deeper into the treatment process of psychological problems.

## 4. DESIGN OF COMPUTER DRAWING SYSTEMS FOR PAINTING THERAPY

In this section, we propose a number of design thoughts for computer drawing systems for supplying painting therapy.

### 4.1. Invention of Computer Painting Software in Painting Therapy

Pictures drawn by hands are extremely precious because they cannot be replicated. However, assistance of computer drawing software in painting is obvious to all. For a patient without any painting experience, draw a vivid image on a piece of paper is very difficult, but after painting software development, breached this problem greatly. People can use a variety of standard drawing tools to draw different kinds of basic graphics, which could be rendered by colour tools to complete a single object. If a complex image is to be drawn, a synthesis method may have to be used [10].

Before 1963, people called graphic works created by some scientists and technicians with mathematic algorithm and electronic equipment as “computer drawing”. In 1968, the first computer art work show was held in London and then shows travelled around Europe. Since 1980s, simple numerical-calculation drawing programs gradually develop into rich 2-D graphic systems and 3-D animation systems [11]. Various information communication modes for expressing and recording human material and spiritual world such as digits, languages, voice, pictures and images, which had clear boundaries in the past, are now digitised and thus integrated and can be converted into each other. Some avant-garde artists begin to touch mouse and find computer is better and quicker than freehand painting in expressing repetition, montage, combination, transfer and dreamlike effect, etc. Application of computer art into visual communication can not only shorten period of visual communication and design but also develop a brand-new world for engaging in creative design by computers [12]. Computer technology has been extensively applied to various artistic fields including photography, painting, music, etc. The art circle also accepts this reality openly. Presently, computer has made extraordinary achievements in movie and television media and showed people huge potential of computer production.

### 4.2. Painting Therapy System with Excellent Pictures and Texts

Current computer drawing software mainly includes Photoshop, illustrator, Painter, Maya, etc. Principal advantages of computer drawing are real colour processing, instant modification, duplication, distortion and colour change, rapid production, convenient transportation, durable storage and unique picture effect. We can utilise these merits of computer software to design a series of 3-D pictures featuring psychological consultation context.

However, there can be a number of issues existing. First of all, the computer software should have an ability of understanding patient's inward world. When the patient cooperates with therapy and accepts computer counseling, an animated character with appearance of the wise gradually approaches the patient and invites him/her to participate in consultation. The patient can choose to accept or refuse the promoted suggestions. If the patient decides to accept, the wizard will lead him/her to enter a harmonious and happy garden and play games with sunny partners who have been waiting there. These games provide many allegorical stories. Patients can use brush pencil to select game program on the screen and sufficiently participate in games. Games have excellent effects on patients of social phobia, autism and infantile autism.

During this process, software will guide patients to draw what they think. After a patient outlines an image, computer will add stereoscopic effect, make improvement automatically, and design different surrounding environments for patients to choose according to their subconscious emotion. The picture will be further perfected until it shows a nice three-dimensional life scene to the patient and makes patient feel like personally on the scene. If a patient draws a fish on the computer, drawing software can simulate various morphological characteristics of the fish, enrich the image of the fish, form a three-dimensional image, automatic generation of underwater environment around the fish. At this point, through the control button, one can make the fish show different angles and swim up. In addition, making scene or the main characters to move by animation techniques can enhance the aesthetic effect of famous paintings. Such as "Qingming Scroll", by making bridge and its key people activity, can enhance the artistic conception of image and life atmosphere, so as to cause the patients to pursue and yearn for a better life.

What issues should be paid attention to on the setting up and operation of the software tools?

Firstly, on the palette set, people need to try to avoid the colour causing dark moods. Before the psychology was well developed, Goethe said: "Colour affects a person's heart and can cause sadness or happy mood". Painting colour effects the psychology gradually [13]. "Black", solemn, annoyed, frustrated; "Gray" more boring, melancholy; "Purple" makes people depressed. According to the psychological characteristics of the patients, black, grey, purple is unfavorable in its palette. The rest of the colours are red, yellow, green, pink, blue and ochre, almost all these colours give a person a kind of sunshine, more bright, vigor, When patients use these colour to paint, the picture presented to be positive to the patient's visual perception. Forming a benign psychological hint, making people forget the sorrow, the pain was relieved.

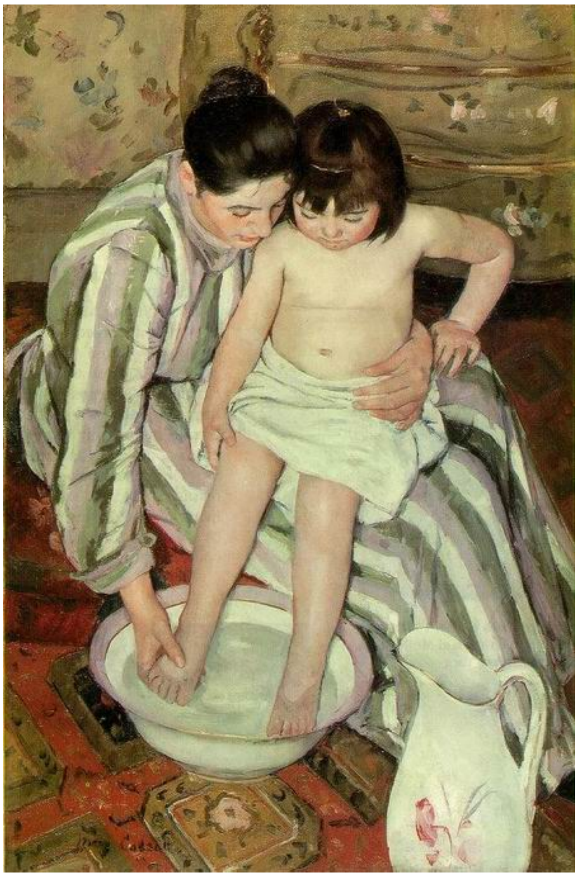

Figure1. " The Child's Bath" by Mary Cassatt

Secondly, more curve tools in painting software should be developed. Why prefer curve, not straight lines? Because, in nature, there are few pure line, even if it does, it is artificial. The curve is the most real, the most common form in nature. Curve including enrich great arc, smooth parabola with sense of speed, the dynamic change of spiral curve, and the "C" shape curve, "S" shape curve, etc. Different curves have different personalities. When the curve is gentle, free and complexity, it gives a person a kind of friendly feeling, in accordance with human complex psychological characteristics, which gives the patients full of humanistic care.

What kind of painting is suitable for the treatment of mental illness? The cause of the disease of most patients has close relation with its growing environment, even the childhood experiences. So, the best treatment plan and the picture form, best with children as the theme. Picture should try to avoid ghost, dark and brutal and to be positive, active and full respect for the feelings of the patient [14]. To consolidate, render patients with childhood memories, establish and improve the good personality fundamentally. In addition, blood and murder works also should not be used as a treatment for mental illness, it will provoke fear memories of patients, cause a vicious cycle.

### 4.3. Curative effect of Reading Painting

Human perception was born chaotic, and also there are no clear boundaries, but an artist can make this confusion in an orderly way, that is obtain structure order within the scope of the vision. The harmonious aesthetic forms conform to the need of people's visual perception order [15]. The orderly images can give a person a kind of certainty; the disordered images, give a person a kind of chaotic feeling, easy to awaken potential psychological problem of patients; Orderly picture is easy to read, disorderly picture make people hard to understand. Picture of realistic and strong sense of order could debug the blundering mood, because the picture often gives a person with true feelings, this drew a clear dividing line with the patient's potential morbid psychology. Therefore, in the process of treatment of mental illness, it is very important to choose paintings. When we watch a well-known painting, "The child’s Bath"( Fig.1), painted by Mary Cassatt, a United States Painter, a nameless moved will arises spontaneously, *mother’s warm and great love is tightly surrounding you*. Composition is looking down in the picture, to depict the affectionate and patient mother, who has the bath ready for the daughter, and is helping her daughter to wash her feet, the daughter is snuggling up in mother's arms quietly and happily, staring at the mother's gentle caress. Through the portrayal of the mother and daughter lovingly, the picture calls up happy memories of the audience. Happiness and satisfaction, and forget the contusion of the mind can be forgotten. In addition, the Chinese landscape painting (Fig.2) provides a better way for patients, the picture designs many beautiful natural sceneries, the visual effect is that you can walk, can see in the picture, and you can be able to live and travel in the picture. Never leave home you can breathe the fresh air in the valley and listen to the birdsong in the forest depths. Relaxed, refreshed, inner anguish will gradually subside and you will even not aware of that. In addition, still life painting, figure painting and genre painting can also play a good curative effect, could be used as a sample in painting therapy.

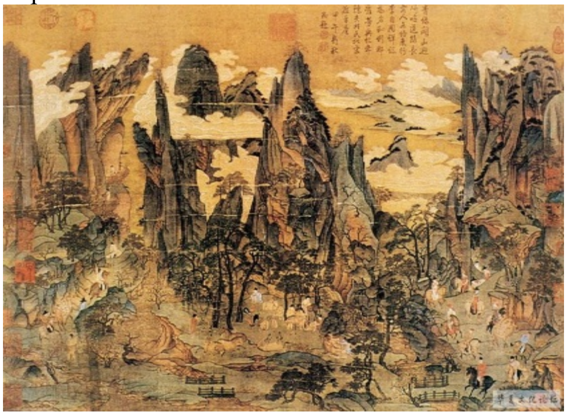

Figure2. “Minghuang of Tang Dynasty Visiting Sichuan” by Zhaodao Li

## 5. CONCLUSIONS

It is well known that human is the main force to promote the development of the society, but with the increasingly development of the society, people's psychological problems will be more and more serious. At the same time, mental disease is a disorder of mood, which is different from physical disease solely relying on drugs, can be cured by the means of education. In recently years, people gradually found the unique efficacy of painting therapy. Especially after the computer drawing software was invented, computer combines drawing, digit, language, voice and image[16], and forms an all-round advanced technology that integrates voice and picture with light. With advantages of humanisation and high efficiency, it will certainly rank among the top drawing therapies and presents its brilliant achievements in treatment of mental diseases.

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# Research and Practice of Project-Driven Teaching Model in " Visual C ++ Programming Design"

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Abstract: At present, many colleges and universities set up the "VC++ program design" course. But the teaching of this course is still stays in the classroom and experimental stage. Therefore, we proposed the hierarchical level project-driven teaching method base on "Conceive, Design, Implement, Operate" framework for the engineering education curriculum. With this method the teaching steps developed according to the real projects. The process of this method include five levels: project selection and demand analysis, Modular teaching content, low-level function implementation, high-level function implementation and software testing, project acceptance evaluation and analysis. We implemented the hierarchical level project-driven teaching method in VC++ program design course. From the results in this paper, we conclude that the hierarchical level project-driven teaching method integrated the advantages of both hierarchical teaching method and projects driven method, which effective improved for traditional project-driving method. It is regarded as a kind of new method suitable for applied talents training.

Keywords: Visual C++, teaching model, project-driven, practice, software

## 1. INTRODUCTION

Visual C++ is a powerful visualization application design language, which widely used C++ development environment based on Windows platform. It is a kind of high development efficiency of high-level programming languages to develop windows applications because of supporting object oriented programming method and MFC class library programming. It is necessary for offering VC++ course in relevant specialities of higher education. Students could improve the professional ability by means of mastering VC++ language grammar knowledge and programming skills. By studying and practicing VC++ program design course, students not only could use C++ language skillfully to compile program code on Windows platform and Visual C++ visualization development environment, but also could have the thought of software engineering with the implementation of comprehensive and high complexity of the basic professional skills required for a software development project.

## 2. THE DEVELOPMENT OF "VISUAL C ++ PROGRAMMING DESIGN"

At present, many colleges and universities of science and engineering specialty set up the "VC++ program design" course in science and engineering specialty as the main aspect of computer application ability training of students [1]. With the growth of market demand of all kinds of visual information system, the student demand for "VC++ program design" course also increased dramatically. It became one of the most popular courses in the elective courses, but the teaching of this course is not so. Most of VC++ courses teaching still stays in the classroom and experimental teaching stage. The main problems include: (1) Students pay attention to the textbook knowledge often more than the practical exercises, on account of the knowledge of textbook more miscellaneous and the teaching of teachers focus on theory. (2) The textbook examples are often aimed at a certain point and teaching of teachers does not provide a comprehensive instance, resulting in the weakly comprehensive design ability of students. (3) The design of experiments lack of attention to the innovative ability of students. Students tend to completely under the arrangement of the teacher doing the experiment, restricted the openness and innovation of students. (4) The teaching objectives attach importance to personal ability, but ignored the team communication cooperation ability. Now, a lot of colleges and universities have realized that the combination of VC++ theory and project teaching model can effectively solve the above problem [2-7]. In the actual teaching process, we combine the course characteristics and students' actual situation proposed and implemented a hierarchical level project-driven teaching method.

## 3. HIERARCHICAL LEVEL PROJECT-DRIVEN TEACHING METHOD

Project driven method is derived by the constructivism learning theory, which putting forward by the famous Swiss psychologist Piaget. With this method the teaching steps developed according to a concept of project. The related knowledge associated with each link of project hierarchically. In the project driven, students achieve the purpose of learning knowledge and cultivating ability through the problem solving of autonomous, using the necessary learning resources and with the help of others [8-10]. Hierarchical level project-driven teaching method is on the basis of project, learning from the knowledge base, learning ability and reality condition. It integrate the projects, teaching goal and teaching content in different stages and levels using suitable project tasks. In this way we have changed the traditional pattern of teacher guide the project progress to the new mode dominated by student project progress mode. In the aspect of teaching we emphasize task driven to mobilize the learning enthusiasm of students fully. Students complete the project design and production process independently. The structure of hierarchical level project-driven method as shown in Figure. 1. The main process is as follows.

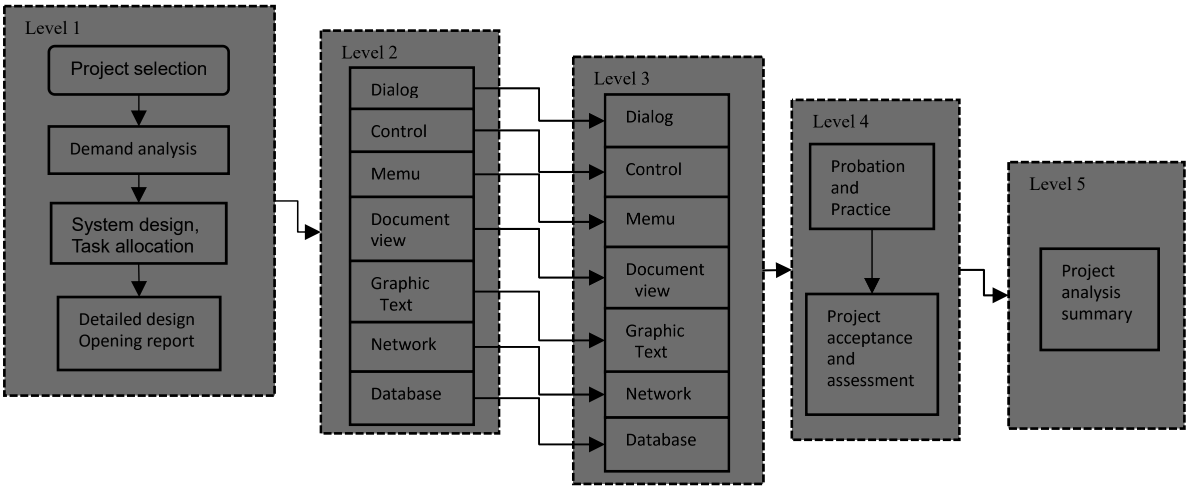

Figure 1. The structure of the hierarchical level project-driven teaching method.

### 3.1 Level 1: Project selection and demand analysis

Teacher put forward mission requirements based on the role of VC++ program design course in the professional curriculum system of students. Students generated a system design document through in-depth understand and analysis of project requirements. This document include the outline of system, system function modules, and the design of software system, which including the basic processing procedure, organization structure, module partition, function distribution, interface design, operation design, data structure design and error handling, etc.. In order to guarantee the demand of software fully allocated to the whole software according to the system design report.

### 3.2 Level 2: Modular teaching content

We teach the theoretical content of VC++ program design according to the modules, contained the principle of each module, the basic method and the extended learning method. In the teaching process, teacher should interact with students as much as possible in order to inspire students to think for the knowledge and cultivate the ability of autonomous learning. To help students the essence of knowledge, teacher should give examples as much as possible. Organization of teaching must assess link close links with the experiment and project design.

### 3.3 Level 3: The low-level function implementation

The experiment process closely related to the projects. Students began coding specific program according to the design requirements on the data structure, algorithm analysis and module implements of software system design. So as to complete the low level functions on the target system, performance and interfaces of the overall framework and basic functions of software project. In the experiment process teacher should communicate with each student to deal with the difficulties encountered in the experiment.

### 3.4 Level 4: The high-level function implementation and software testing

In the high-level software function coding phase, students complete all functions of each module so as to realize the function of the target system on the basis of experimental results. In terms of the standardization of the development process, coding up to no more than 1/2 in the whole project process, usually in a third of the time. To avoid individual small module affected the whole progress, students should pay attention to coordination and collaboration between different modules when coding progress. Software test is also a very important step in the project development after the program coding completion. There are many kinds of software test methods: According to the test execution, they can be divided into internal and external test methods; According to the testing range, they can be divided into modules and the overall alignment; According to the test conditions, they can be divided into normal operation condition testing and exceptions; According to the test input range, they can be divided into full coverage testing and sampling test.

### 3.5 Level 5: Project acceptance evaluation and analysis

After the project completion, teacher evaluate the project according to the result of explanation and demonstration of project by the project team. Project analysis based on the structure and function module of project. The analysis regards project implement as core, taking the student as the main body. In the process of the project analysis, students could review and learn at the same time. They could consolidate all the knowledge in the teaching target and give full play to subjective initiative and creativity.

## 4. THE CHARACTERISTICS OF HIERARCHICAL LEVEL PROJECT-DRIVEN TEACHING MODE

### 4.1 Learning scene is authentic

The project-driven teaching method around the activities of gain knowledge of students, based on real specific project according to the situation of demand, so that students gain experience in the personal experience and education activities.

### 4.2 Learning content is comprehensive and open

Project-driven teaching method is comprehensive and extensible whether the problem large or small. It combines theoretical knowledge and practical operation in a project. The problems in the practice could analyze from a variety of angles, which are changing and developing.

### 4.3 The way to learn is diverse and collaborative

Project-driven teaching method is implemented through practicing, learning, discovering and cooperation. So a lot of learning content will be in the form of self-study. Students get the opportunity of implement innovative achievements through in-depth understanding and researching.

### 4.4 Creativity of teachers

The study enthusiasm of students could be stimulated greatly if teacher implement project-driven teaching method correctly. So as to students could complete the project of high quality.

## 5. THE EFFECT OF IMPLEMENTATION

We implemented the hierarchical level project-driven teaching method in VC++ program design course. The number of students in this class is 78, which is divided into 13 project teams, each project team has 6 students. The result of completion of the projects for each team as shown in Figure. 2.

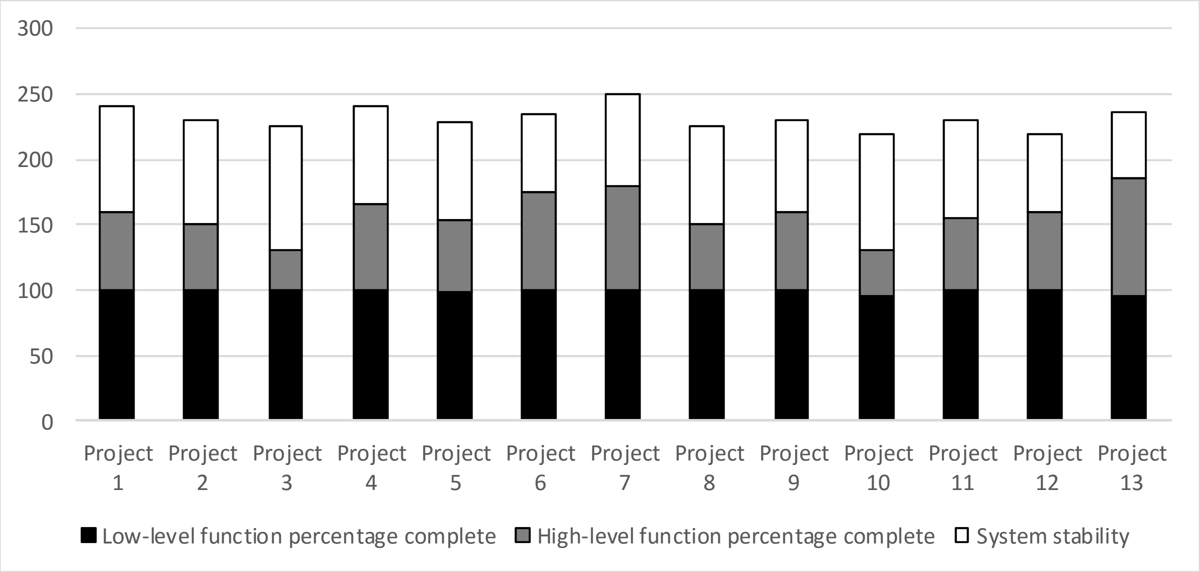

Figure 2. Implementing status of projects.

All of 13 teams can be completed the low-level function of their project and the completion rate no more than 95 percent. But most of the teams were not fully complete the high-level function of project from the perspective of the result of test. The stability of the softwares are slightly insufficient. It means that more than 90 percent students have mastered the basic way of using the VC++ program, comprehended the framework structure of MFC and design thinking, and could solve the problem of general application take advantage of VC++ program. More than 50 percent of the students have been able to flexible use MFC to solve the problem of complex applications.

## 6. CONCLUSIONS

Hierarchical level project-driven teaching method is a novel method. It integrated the advantages of both hierarchical teaching method and projects driven method, which effective improved for traditional project-driving method. The main body of project-driven method from teachers to students, so as to stimulate the autonomous learning ability of students. In this way, students could meet the need of society, more actively in the face of competition and play to their creativity in learning. Hierarchical level project-driven teaching method add the scientific research and innovation of thought to the curriculum and transform the traditional passive accept knowledge form into active seek knowledge. In order to solve the problems effectively such as out dated contents, simple form and stiff teaching. In short, hierarchical level project-driven teaching method is regarded as a kind of new method suitable for applied talents training.

ACKNOWLEDGMENT

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# The Research and Development of Basketball Web-based Coureswware

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Abstract: With the development and popularization of basketball in colleges and the further development of physical education reform at present, the quality of basketball teaching is paid more attention by people. With the rapid development of computers, basketball teaching with the use of multimedia has been realized. This paper discusses the necessity of basketball CAI courseware. It introduces the process of developing and realizing the CAI courseware by FLASH, DREAMWEAVER software and the impact on students, teaching and research.

Keywords: research methods, basketball coureswware

## 1. INTRODUCTION

With the development of modern science and technology, computer technology has been developed rapidly in the field of education in our country. And as a result, a new study area called computer aided education (CBE), combined by comprehensive teaching and computer technology, has developed. Especially in recent years, with the maturity of computer multiply media, the search and spread of Computer Assisted Instruction gained a new success. However, in our country, the manufacture of computer media assisted software just at the very beginning and its applied range is also limited. In the 21st century, talents and science and technology compete sharply .The information characteristics of epoch will be more obvious. Media Assisted Instruction will be a crucial approch in stimulating integration of teaching steps. General basketball course aims at konwing well about basic basketball knowledge and tactical ability and developing teachers. When you go out to be a teacher, you will face all kinds of students in various school. Doing the subject well would be benefit of popularizing Multimedia Computer Assisted Instruction in sports teaching in every school. Thus, this subject has a very crutical theory and reality meaning. It will develop a new way in sports teaching, and also, it would aweaken other teaching projects besides basketball.

## 2. Research objects and research methods

### A. Research objects

This research puts the teaching content of general basketball course for the main content of the courseware, collecting a large number of relevant pictures and video, and make corresponding graphics, image and animation, and making a multimedia courseware used for classroom collective teaching. This research puts the teaching content of general basketball course for the main content of the courseware, collecting a large number of relevant pictures and video, and make corresponding graphics, image and animation, and making a multimedia courseware used for classroom collective teaching.

### B. Research methods

The literature material method, expert interview method, questionnaire, software formation method and experts identified method , etc

## 3. Results and analysis

### A. The types and modes of the courseware determine

Through the research at General basketball course teaching syllabus and teaching materials, and experts interview and questionnaire survey results,it is turn out that the courseware is a computer assisted teaching system ,and it is mainly for the students to apply. Because it is flexible to use ,we can utilize it to customised study progress and facilitate human-computer interaction.According to the multimedia course ware design principles and consider teaching truth as well proved that the mode of the courseware is collective teaching pattern.

### B. The selection of courseware content

Basketball CAI courseware‘s script was written in basic accordance with the People's Sports Publishing House of the Higher Education Sports Elective Course textbook series "Basketball" ’s order, refer to the various versions of textbooks and related materials, the content is carefully conceived, well-produced video and pictures animation of nearly 200.The selection of courseware content to the material fully, Primary and secondary clear, and considers students how to do from simple to complex, from perceptual knowledge to rational knowledge of the learning process. The courseware services to the teaching material, and also can be separated from the teaching material to form a complete system.

### C. The design of overall courseware knowledge structure

By means of visited experienced teachers and professors who was engaged in long-period basketball major teaching ,treat General basketball course teaching materials as a conception ,based on General course teaching tasks, proceed with discuss and choose, finally locate the knowledge points of the basketball Theory courses. In the light of selected knowledge points to devise the structure. the result in figure 1

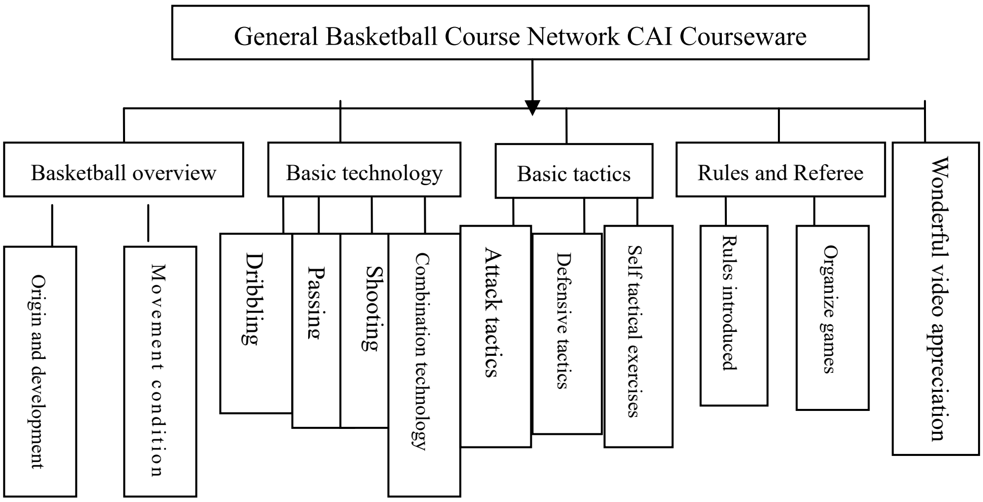
General Basketball Course Network CAI Courseware
Basketball overview
Basic technology
Basic tactics
Rules and Referee
Wonderful video appreciation
Origin and development
Movement condition
Dribbling
Passing
Shooting
Combination technology
Attack tactics
Defensive tactics
Self tactical exercises
Rules introduced
Organize games

Figure. 1。General basketball course CAI courseware structure

D. The establishment of Multimedia material database

Multimedia material database is the base of the software design in the multimedia courseware, and the main content of the courseware system design. Therefore, based on clearing the teaching task and content, collecting widely and downloading various related media material from network media, such as figures, pictures, music CD/VCD, videos and CD, etc.; meanwhile, with his own design and manufacture of graphics, image, animation, using the Windows enclosed recorder software to edit audio file, and provide commentary. background music and related media material. Finally establishing dubbing library, background library, pictures galleries, synchronous animation library and synchronous video library and so on, based on multimedia material database.

E. The design and fabrication for the courseware system

The courseware system mainly use FLASH MX 2004 and Dreamweaver multimedia development system, with picture disposed software Photoshop 6.0 was accomplished

The courseware system structure is shown in figure 2. By considering the need of collective classroom-teaching, courseware system structure shall prevail reticular formation, that is knowledge points as a unit, separately demo the unit. At the same time, among the unit, the unit between homepage both set up hyperlink. The animation effects of FLASH MX 2004 software can greatly provide the courseware animation effect, its unique video into further function can improve the courseware in the quality of the video action demonstration. After finishing the courseware, using development software DREAMWARE to change it into HTML document. Then put the HTML courseware on sever of school website. Students can study wherever through the Internet.

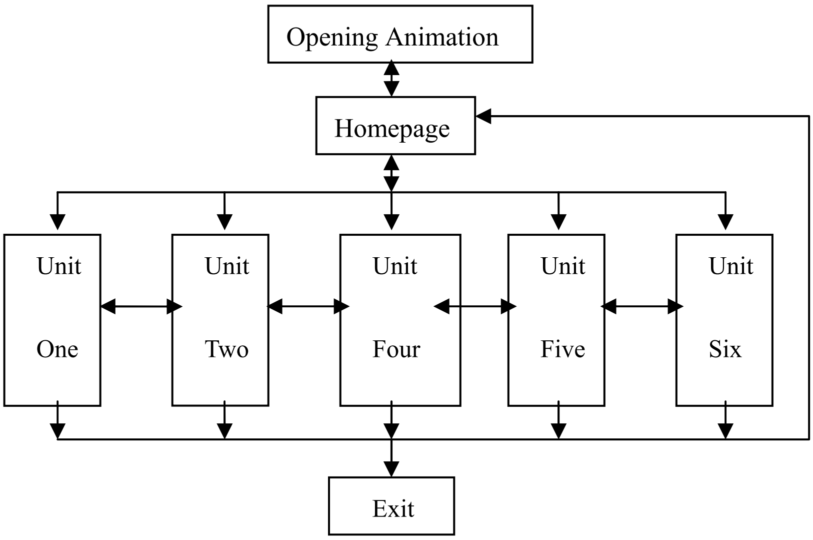
Opening Animation
Homepage
Unit One
Unit Two
Unit Four
Unit Five
Unit Six
Exit

Figure. 2: Courseware structure chart

## 4. Conclusion

A. With a platform of INTERNET, general basketball course network CAI broke through the restrictions on the time and the place for students' study.

B. Adding auxiliary teaching to general basketball course network CAI is more advantageous to exert students' initiative and practice students' intelligence, which is quite helpful in strengthening students' subjective abilities.

C. In teaching CAI courseware, the teacher puts forward some key questions to guide the students to think and makes students focus on the key problems when studying, which can help students improve the ability of analyzing the questions and solving the problems.

D. It is the basketball teachers' participation and design in the courseware that set up a new way to exploit the courseware of sports teaching.

## 5. Proposal

A. Teachers should improve their own ability in developing and utilizing computer technology, design and make the suitable classroom-teaching software, do well in the teaching design, and applied in teaching.

B.Pay more attention to the purpose of our multimedia CAI courseware teaching and understand the key meaning of computer assisted teaching is "assisted" ,the major of teaching still are teachers, we can not put the cart before the horse.

C. Let student understand how to cooperate with teachers, change their educational concept , enjoy teaching process positively, think deeply, to catch the major content of the teaching.

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# Study on Mechanism of College English Teachers Occupation Burnout and Countermeasures -- Based on the Empirical Study in Hangzhou Higher Education Park

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Abstract: In view of the above-mentioned situation, this study chooses the Independent College English teachers as the research object, from both subjective and objective aspects, to construct the factor model of Independent College English teacher burnout, and uses statistical method to analyze the effects of various factors on job burnout ,expecting universities and Department of Education to pay attention to the phenomenon of occupational burnout. While providing a certain degree of theoretical support for the introduction of relevant policies , we can guide and help teachers calmly out of job burnout and make positive efforts.

Key words: College English Teachers, Occupation Burnout, Countermeasures

## 1. INTRODUCTION

Frequent teachers Dutch act events and most college teachers mental health crisis can not be ignored . Many scholars in china get concerned with the problem. In terms of stress source of college teachers, and the impact factors ,considerable achievements has been made. Li Zhaoliang, and Gao Yan, in the year of the 2007, use internationally-accepted Maslach burnout inventory table ( MBI HSS ),taking 522 teachers for investigation . Results shows that the main top 3 stress sources of university teachers are the low wages and welfares(328 teachers, occupying 62.8%); the scientific research and article making university teachers tired out(318 Teachers occupying 60.9%); and pains not in proportion with gains(316 Teachers ,occupying 60.5%). Certain degree of emotional exhaustion and low sense of achievement exist in teachers in Colleges and universities. In theoretical research, Su QIN ,scholar on personality ,thought that teachers' psychological pressure comes from three aspects : personal factors, school factors and social factors . Li Fengchao, in 2008, compiled the " college teachers working pressure source table scale", which is divided into 9 factors, and at the same time the university teachers of different titles, different seniority and different disciplines differ a lot among different factors

In view of the above-mentioned situation, this study chooses the Independent College English teachers as the research object, from both subjective and objective aspects, to construct the factor model of Independent College English teacher burnout, and uses statistical method to analyze the effects of various factors on job burnout ,expecting universities and Department of Education to pay attention to the phenomenon of occupational burnout. While providing a certain degree of theoretical support for the introduction of relevant policies , we can guide and help teachers calmly out of job burnout and make positive efforts.

## 2. RESEARCH METHOD AND RESEARCH OBJECT

### 2.1The questionnaire

The questionnaire was designed and edited by Mallers (Maslach, 1982), and revised by scholars in Taiwan .The.research shows that the reliability and validity of MBI has cross-cultural consistency. The internal consistency coefficient of Teacher job burnout scale is between the 0.80-0.86 , divided half reliability into between the 0.78-0.84 , and retest reliability is between the 0.75-0.76, which has good reliability and validity. MBI questionnaire is consisted of emotional exhaustion (9 problems) , to personalized (5 problems) and low personal sense of achievement (8 problems ) in three dimensions. Questionnaire has a total of 22 questions, and adopted 4 points scoring method, "has never been so", "few such", "sometimes", "often so" respectively 1, 2, 3, 4 points. Score below 2 indicates that job burnout problem does not exist. 2-3 indicates that there is the problem of job burnout; 3 points or more, shows that job burnout is a serious problem .

### 2.2research process

This study adopted cluster random sampling method, taking 150 English teachers as object in Hangzhou Xiasha Higher Education Park in Zhejiang Province. The participants were from Hangzhou Normal University , Zhejiang University of Finance and economics, Zhejiang Gongshang University and Zhejiang Science University .Extend 150 questionnaires, and recycle137 copies of effective questionnaire, and the effective recovery rate is 91%. The demographic variables include gender, education, work experience, age, seniority, job title, income and marital status etc.

## 3. SURVEY RESULTS AND ANALYSIS

Demographic variables on Job Burnout of English teachers, the education statistics SPSS17.0 of data for independent sample t test, analysis of variance and multiple comparisons and analysis, analysis results are as follows: Understand professional status of College English teachers

Table 1 College English teachers occupation burnout scores (M + SD)

| Dimension | Emotional Exhaustion | deindividuation | Personal Accomplishment | Occupation burnout |
|---|---|---|---|---|
| Mean Value | 2.09±0.42 | 2.00±0.41 | 2.17±0.41 | 2.10±0.36 |

In tab. 1, it shows that the job burnout is widespread in college English teachers., Job burnout belongs to moderate intensity, and on the whole it is not serious (above scores of 3 shows that job burnout is more serious).From the point of view of the average score of each dimension, the low l sense of success is the highest, and the average score reached 2.17.For emotional exhaustion, the average score is 2.09; and the lowest is depersonalized, the average score 2.00.

### 3.1 gender difference in the college English teachers occupation burnout

Table 2 total score of College English teacher burnout and each dimension in gender (M + SD)

| Dimension | Male (n=) | Female (n) | T |
|---|---|---|---|
| Emotional Exhaustion | 2.14±0.39 | 2.04±0.45 | |
| deindividuation | 2.00±0.43 | 1.99±0.40 | |
| Personal Accomplishment | 2.23±0.39 | 2.12±0.39 | |
| Occupation burnout | 2014±0.34 | 2.06±0.37 | |

Using independent samples test, the analysis to the burnout of the English teachers, from the tab.2 shows that, teacher burnout on the gender dimensions has no significant differences. But from the average point of view, the three dimensions of emotional exhaustion, personality and low personal accomplishment scores and job burnout scores of male teachers are higher than female teachers.

### 3.2 College English teachers occupation burnout differences in age

Table 3 University English teacher burnout total score and each dimension in the age difference(M ±SD)

| Dimension | Male (n=) | Female (n) | T |
|---|---|---|---|
| Emotional Exhaustion | 2.14±0.39 | 2.04±0.45 | |
| deindividuation | 2.00±0.43 | 1.99±0.40 | |
| Personal Accomplishment | 2.23±0.39 | 2.12±0.39 | |
| Occupation burnout | 2014±0.34 | 2.06±0.37 | |

Tabl.3 shows that, in the dimension of emotional exhaustion, 25-35 age group teachers scores the highest, followed by the 36-45 age group of teachers, and 46 years old age groups is in the lowest division; In depersonalization, 36-45 age group of teachers has the highest scores, then is 25 years old and the lowest is the 25-35 age group; in the low personal accomplishment dimension, 25 age group of teachers has the highest scores, then the 25-35 age group of 36-45 years old group of teachers, and teachers occupation burnout scores is in the lowest; In the dimension of total score, 25 years old age group the highest, then is 25-35 age group of teachers , and 46 years old group teachers is the lowest.

### 3.3College English teachers occupation burnout differences in education degree

Table 4 college English teacher burnout total score and each dimension on the education degree (M ±SD)

| Dimension | Male (n=) | Female (n) | T |
|---|---|---|---|
| Emotional Exhaustion | 2.14±0.39 | 2.04±0.45 | |
| deindividuation | 2.00±0.43 | 1.99±0.40 | |
| Personal Accomplishment | 2.23±0.39 | 2.12±0.39 | |
| Occupation burnout | 2014±0.34 | 2.06±0.37 | |

In tab4, the English teachers of different education degree have significant differences in the dimension of low personal accomplishment. Multiple comparison (LSD) finds that undergraduate education teachers in the sense of personal achievement is significantly higher than the graduate education teachers.

### 3.4 College English teachers occupation burnout differences in the working experience

Table 5 University English teacher burnout total score and each dimension in the work experience difference (M ±SD)

| Dimension | Male (n=) | Female (n) | T |
|---|---|---|---|
| Emotional Exhaustion | 2.14±0.39 | 2.04±0.45 | |
| deindividuation | 2.00±0.43 | 1.99±0.40 | |
| Personal Accomplishment | 2.23±0.39 | 2.12±0.39 | |
| Occupation burnout | 2014±0.34 | 2.06±0.37 | |

In tab.5, variance analysis on the working life can be found. Significant difference for different work experience teacher exists in the dimension of emotional exhaustion; But there is no significant difference in the three dimensions and total score of job burnout.

### 3.5College English teachers occupation burnout differences in income

Table 6 University English teacher burnout total score and each dimension in Income differences (M ± SD)

| Dimension | Male (n=) | Female (n) | T |
|---|---|---|---|
| Emotional Exhaustion | 2.14±0.39 | 2.04±0.45 | |
| deindividuation | 2.00±0.43 | 1.99±0.40 | |
| Personal Accomplishment | 2.23±0.39 | 2.12±0.39 | |
| Occupation burnout | 2014±0.34 | 2.06±0.37 | |

In tab.6, there are no significant differences in the three dimensions and occupation burnout. From the average, in the low sense of personal accomplishment, 2000-3000 yuan teachers score the highest; then 3000-4000 yuan, and more than 5000 yuan is the minimum; in the dimension of emotional exhaustion and job burnout, the income of 2000-3000 yuan scores the highest, second is 4000-5000, and 5000 yuan, the minimum; in the deindividuation dimension, 4000-5000 yuan teachers score the highest, then 2000-3000 yuan, and 3000-4000 yuan, the minimum.

3.6College English teachers occupation burnout differences in title

Table 7 University English teacher burnout total score and each dimension in the title difference (M ± SD)

| Dimension | Male (n=) | Female (n) | T |
|---|---|---|---|
| Emotional Exhaustion | 2.14±0.39 | 2.04±0.45 | |
| deindividuation | 2.00±0.43 | 1.99±0.40 | |
| Personal Accomplishment | 2.23±0.39 | 2.12±0.39 | |
| Occupation burnout | 2014±0.34 | 2.06±0.37 | |

Job burnout among teachers in different titles are analyzed by variance analysis in table 5. In the dimension of emotional exhaustion and low t sense of personal achievement, the primary professional title teachers score the highest and teachers with senior professional titles, the minimum; in dimension of personality and job burnout, primary title teachers score the highest, intermediate grade teachers minimum; totally there was no significant difference in the three dimensions and total score of job burnout. Through the above analysis, moderate burnout exists in College teachers of English, but overall not too serious. Among English teachers with different education background in the low sense of personal accomplishment exists significant difference; Among different working years and different serving teachers, in the dimension of emotional exhaustion, exists significant difference. In the other two dimensions, no significant difference. In addition, the teachers in sex, marital status, age, professional title, income and whether or not living in campus have no significant difference.

## 4. EFFECTS MECHANISM AND COUNTERMEASURE ANALYSIS

### 4.1causes for teachers" occupation burnout mainly in following aspects

#### 4.1.1 self-development puzzle .

Personal factors and teachers occupation burnout are closely linked. The introvert teacher is more likely to get job burnout, compared with the cheerful teacher. The more the teachers experience in their Work, the More they tend to think that they are fit for the job, which is more Inclined To agree with the value of the work for the individual development, to reduce the probability Of occurrence of job burnout. Burnout is related to age, and a number of studies have found that young teachers show higher levels of emotional exhaustion than older teachers. With the growth of seniority, teacher burnout grew rapidly. In gender, female teachers' job burnout is slightly lower than that of male teachers, but not very clear, unrealistic to their own requirements.

#### 4.1.2.incapablity to adapt to the management and competition of school

For a long time, the deviation phenomenon in the school management system has plagued some school teachers' professional development. A strict system of teacher’s keeping office hour, and the rigid implementation of the supervision and administration makes many teachers feel physical and mental fatigue, extremely depressed and the creation passion is greatly extruded, and self-esteem has been seriously violated.

#### 4.1.3. lack of social support .

Lack of social support is an important cause of teachers" occupation burnout. When teachers are people on the altar, they also become a victim to the altar.

#### 4.1.4. work stress.

The investigation shows that working time for the teachers' work per day is 9.67 hours, 1.67 hours more than average working hours of other positions in the general staff, sleep 1 hours less and entertainment time 0.5 hours less..

#### 4.1.5. fair treatment issue.

To improve teachers' treatment seems to have been the common language of many teachers, and the same profession produce the same amount of work, however, the treatment is different. The society is developing by leaps and bounds, many teachers’ treatment is far behind the price soaring. The psychological gap is not relieved, which is one of the important reasons. 6 student problems, parents demanding.

### 4.2. solutions

In the social environment of education, to improve and establish a new concept of education, to reform school , including reform of education and teaching system, and to make full use of resources of society, local governments and enterprises to run schools, to relieve their own school of the heavy pressure, and to improve the social status of teachers. In addition, attention should be paid to the improvement of school physical environment and a good mental environment. The continuing education of teachers should be carried on to keep up with the times. To Constantly update and expand their knowledge, to master the new knowledge, and to use modern teaching methods in teaching. can cultivate talents to adapt to the needs of society in the future .

Speaking from the teachers themselves, to continue to enhance their quality, to improve the correct understanding of their education and responsibility, to establish high standards of professional ethics and professional beliefs, and to have a correct understanding of burnout can realize the necessary self-adjustment.

## 5. CONCLUSION

This study is on the model for empirical and systematic research for teachers occupation burnout, and to some extent, it compensates for the lack of domestic and foreign colleagues in this research field, and the theories established have a certain theoretical significance; on the other hand, through the study, to arouse the society especially the departments of education, and school management to focus on teachers, especially English teachers" physical and mental health to improve the teachers" work, study and living conditions, and to attract talented people to teach in a long term. A positive and lasting efforts to enhance the quality of education and teaching should be taken.

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# What Has Never Ever Happened

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Editor's Note: This article describes an orphan's mentality changes in once dreaming, and it ingeniously combines the characteristics of the spring, love, friendship and parents' love together into the dream. Finally this article ends with the orphan waking up and his partners' friendship sublimation. A lot of writing skills, such as metaphor, analogy are used in this article, which fills the dream of the orphan with the beauty of the spring, makes the reader to start the association and imagination. Each end of chapter has responded to the theme "spring is a pretty season ", which lets the whole article seem well structured. One chapter deviates from the theme somehow, so the editor deleted it, which does not influence the reading.

Keywords: orphan, dream, love, friendship, spring

He is an orphan, brought up in the lack of the care of relatives, the company of friends. Sense of inferiority of the life made him depressed and desolate. He often confine himself to a small community and do everything all by himself. The lack of friendship and kinship leave him nothing but odorless, colorless air and monotonous, boring life.

Spring came again. The rose beside the garden was bustling, giving off fragrance. Beautiful kites flew with the wind and into the sky from the grass, carrying the joy of the children, also along with the dream they beard in mind - what has never ever happened. At this moment, he was lying alone on the grass as he often did, looking up to the gray sky, as if he were the only one in the whole world. Gradually, he fell asleep, somehow giving a long-lost smile.

## THE PLEASURE OF THE FRIENDSHIP

Spring is in the treetops, chattering birds twittering in the branches. Spring is on the roof, eaves glittering in the sunshine. Spring is with the children, and the children just playing happily on the grass.

A burst of laughter came from the window, and it turned out to be him playing with the other children, that thing had never ever happened before. They sometimes sings, sometimes dances, and sometimes plays games. Although he did not win any game, he was intoxicated in which winning or losing has become a secondary matter. What he wanted only was indulging in the ocean of the friendship. His partners sometimes applauded for him, making he laughed a happier laughter.

He started to love spring, because it was beautiful, sweet, and joyful. More importantly, he made friends and had the real fun in spring. In spring, friends would not call him "wild child" as before. Also, because of the spring, for the first time, he felt the pleasure of the friendship. He used to exchange his smiles, tolerance and comfort for the sincere acceptance from friends many times, but it had all been disregarded. Friends drift away from him one by one, which was exactly the darkest time for him.

But now, under the shade of the tree, he and the other children all in the pretty outfit chased each other on the grass. For a moment, he was talking with old friends about the past happiness. For another, dream about the bright and colorful future. In the moment, he no longer felt the loneliness and desolation, but the delight and purity of friendship. At this moment, the company of friends was just like a toffee, making him sincerely happy and sweet.

He sincerely felt that spring is a pretty season.

## THE PROFOUNDNESS OF THE LOVE

He went back home with the schoolbag as usual after having lots of fun with his friends. Door closed as always, he thought that he had to cook by himself again today. But the moment he opened the door, he was pleasantly surprised to find the decoration of the room. Only to hear "bang", pieces of ribbon dropped down. Dad took several balloons, excitedly waving his arms. Mum held a beautiful cake standing beside. They happily cheered: "Sweetheart, Happy Birthday!" At this moment, the birthday song went off, slowly came his parents, "Sweetheart, make a wish!" Mom urged. “Come on", said father, “Our son is one year older. I hope he becomes more and more mature, excellent and happy!"

At the dinner table, the feast prepared by Mom and Dad, he could not help but shedding tears. This is what has never happened before. The lessons were taught earnestly by parents, the influence of tenderness, and the profoundness of love warmed his heart. He silently made a wish in his heart.

I really hope all this can be long-lasting.

He sincerely felt that spring is a pretty season.

## THE CHARM OF THE REALITY

The twittering of the birds awakened him. It was merely a dream, but the scenario was so real - the same wind, the same scene, the same spring, even the same partners on the opposite. Wait a minute, he rubbed his eyes - a girl he had never seen led a group of kids came along - "What do you want?" He moved back a bit, nervously asked, calling up to his memory that they used to make fun of him. "My name is in the spring, and they want to apologize to you, and we want to be your friends." The girl held out her hand to pull him up, he hesitated for a moment...this is what has never happened before.

He sincerely felt that spring is a pretty season.

# Research on Index System Optimization of “Evaluating by Students” Based on Fuzzy Comprehensive Evaluation Method

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Abstract: For the key link of teaching quality evaluation to improve the teaching quality, the traditional evaluation method focuses on the qualitative description with thick subjective color, and it’s difficult to operate when it comes to teacher motivation and assessment. The introduction of fuzzy comprehensive evaluation method can not only quantify factor indexes which are difficult to quantify to ensure the objectivity and authenticity of the evaluation results, but provides reference for the evaluation of the teaching quality of teachers at all levels of the school. Through empirical research, the results show that the fuzzy comprehensive evaluation model can reflect objectively and carefully the teachers' teaching quality.

Key words: fuzzy comprehensive evaluation method school evaluation optimization

## 1. INTRODUCTION

Teaching quality is the key to improve the quality of education and teaching in colleges and universities. Teaching quality evaluation is one of the important means to mobilize effectively the enthusiasm of teachers and promote the reform of teaching methods. But the factors affecting the quality of teaching are very fuzzy, so that we can’t use quantitative data to quantify assessment and evaluation. The fuzzy comprehensive evaluation method can quantify some factors which are unclear and difficult to quantify objectively and effectively, so we can evaluate effectively and obtain actual evaluation results. According to the teaching situation of some teachers, students and experts were organized for its evaluation, obtain the final evaluation results indicated that the teachers.

## 2. THE BASIC PRINCIPLE AND PROCEDURE OF FUZZY COMPREHENSIVE EVALUATION METHOD

Fuzzy comprehensive evaluation is one of the methods using some of the concepts of fuzzy mathematics to provide some evaluation for the actual problem. Specifically, fuzzy comprehensive evaluation is based on fuzzy mathematics, applying the fuzzy synthetic relationship principle and quantifying those factors that are not clear and not easy to quantitative, then evaluates on the evaluation level of the state of things under the comprehensive evaluation.

### 2.1 determine the evaluation factors and evaluation grade

Set up $U=\left(u_1,u_2,\cdots u_m\right)$ as m factors (evaluation indexes) describing the evaluation objects; $V=\left(v_1,v_2,\cdots v_n\right)$ as n kinds of judgment (evaluation grade) describing each factor of the state. That is, according to the actual situation, people usually use the appropriate language to describe the evaluation people make for a single factor.

### 2.2 construct the evaluation matrix

Focus on the thing of $v_j$ ’s membership from the factor $u_i$, then obtain the i-th factor $u_i$ ’s single factor evaluation set: $r_i=\left(r_{i1},r_{i2},\cdots,r_{im}\right)$ ; m evaluation factors set can be constructed one total evaluation matrix R: R=(rij)m* n. Among, $r_{ij}$ is the frequency distribution of $u_i$ (i-th element) at $v_j$ (j-th comment), normalize those data generally so $\sum_{r_{ij}}=1$.

### 2.3 determine the weight

The fuzzy relation matrix can’t evaluate on things fully. According to each factor’s importance and role in things, introduce one of the fuzzy subsets A in U, named weight. Set up $A=(a_1,a_2,\cdots,a_n)$ , $a_i\geq 0$ , $\sum a_i=1$ , where $a_i$ is the factor $u_i$ ’s influence degree in comprehensive evaluation.

### 2.4 Comprehensive evaluation

Introduce one of fuzzy subsets B in V, $B=(b_1,b_2,\cdots,b_n)$ , named fuzzy judge. For the evaluation object, the evaluation result is: $B=A\times R=(b_1,b_2,\cdots b_m)$ . We should normalized those data if the evaluation result $\sum b_j\neq 1$. If the fuzzy comprehensive evaluation is multi-layered, one the basis, let $B_i$ as $U_i$ ’s single factor evaluation, then obtain U’s single factor evaluation matrix: $R=(b_1,b_2,\cdots b_s)'$ . Given the weight A according to the importance of each factor for $U_i$ in

$U$ . Finally obtain the comprehensive reviews $B = A \times R$ .

2.5 determine the evaluation results

According to the results of model calculations, get a more intuitive explanation or explicit evaluation based on maximum membership principle, or give a certain score based on the evaluation level, finally obtain the comprehensive score.

## 3. THE DESIGN OF EVALUATION INDEX SYSTEM

Teaching is a method lecturers transform knowledge and information to the educator by applying all means of teaching, and then the educated is expected to achieve the purpose of learning. The scientific and reasonable evaluation index design is critical to the evaluation results and effectiveness of evaluation. According to the recommendations of experts and professors, we can evaluate the teaching quality of teachers from comprehensive quality, teaching process and teaching effect three aspects.

(1) The quality of teachers is the decisive factor to improve teaching quality. Sometimes using thinking and language level, the theory of literacy and moral cultivation, profound professional knowledge reflect comprehensive quality. It reflects the teachers theoretical foundation and moral character, whether to have both ability and political integrity, whether to teach students with new knowledge, new method of the development of the times.

(2) The teaching process is the specific application performance of teaching mode in the teaching object's performance, which is reflected by teaching methods, teaching attitude and answering questions, correcting homework, the injection of new knowledge in classroom and so on.

(3) The reflection of teaching effect relies on university students' applications of course knowledge.

It can be reflected by the growth of students' basic knowledge, the enhancing of practical ability and creative thinking. See Table 1

Table1 the general situation of teachers' teaching evaluation index

| | | |
|---|---|---|
| U:<br>The general situation of teaching | U1: comprehensive quality (30%) | Teaching ideas, language expression 30% |
| | | Theory accomplishment, moral cultivation 30% |
| | | Professional knowledge 40% |
| | U2: teaching process (40%) | Teaching devices 20% |
| | | Pedagogic method 30% |
| | | The situation of teaching attitude, answering questions, correcting homework 20% |
| | | The use of new knowledge 30% |
| | U3: teaching effectiveness (30%) | Students' professional knowledge increased significantly 30% |
| | | Students' practical abilities enhance significantly 30% |
| | | The students' creative thinking enhance significantly 40% |

## 4. CASE STUDY

In this paper, take a university teacher's teaching situation as an example, the evaluation level and basic data were obtained from the statistical questionnaires through releasing questionnaires to 65 reviewers (12 expert teachers and 53 Students). According to the basic data, using the principle and steps of the fuzzy comprehensive evaluation method calculates the overall evaluation of the teaching quality of the teachers. Comprehensive evaluation is divided into "teaching evaluation " and " evaluating by co-teachers ".

4.1 evaluation and calculation of "evaluating by students"

"Evaluating by students" is the evaluation of students to teachers. Students' evaluation is the most direct reflection to the teaching quality of teachers. The statistical results of the teaching general situation of a teacher are shown in table 2 after a survey of 53 students

Table 2 evaluation statistics of "evaluating by students"

| Evaluation factors | excellent | good | medium | pass | Fail |
|---|---|---|---|---|---|
| Teaching ideas, language expression | 36 | 16 | 1 | 0 | 0 |
| Theory accomplishment, moral cultivation | 29 | 21 | 3 | 0 | 0 |
| Professional knowledge | 25 | 23 | 5 | 0 | 0 |
| Teaching devices | 28 | 20 | 4 | 1 | 0 |
| Pedagogic method | 28 | 20 | 5 | 0 | 0 |
| The situation of teaching attitude, answering questions, correcting homework | 23 | 20 | 10 | 0 | 0 |
| The use of new knowledge | 22 | 28 | 3 | 0 | 0 |
| Students' professional knowledge increased significantly | 23 | 20 | 10 | 0 | 0 |
| Students' practical abilities enhance significantly | 19 | 28 | 6 | 0 | 0 |

| | | | | | |
|---|---|---|---|---|---|
| The students' creative thinking enhance significantly | 32 | 17 | 4 | 0 | 0 |

According to the fuzzy comprehensive evaluation method of thought and steps, determine the set of factors U={comprehensive quality, teaching process , teaching effectiveness}, and $U_1$={ comprehensive quality}, $U_2$={ teaching process }, $U_3$={ teaching effectiveness }. Comment sets V={excellent, good, medium, pass, fail}. Weight $A_1$=(0.3,0.3,0.4), A2 =(0.2,0.3,0.2,0.3),A3 =( 0.3,0.3,0.4).

Do single factor evaluation of $U_1$={ comprehensive quality}, then obtain the evaluation matrix R1,

$$R_1 = \begin{bmatrix} 36 & 16 & 1 & 1 & 0 \\ 29 & 21 & 3 & 0 & 0 \\ 25 & 23 & 5 & 0 & 0 \end{bmatrix}$$

After normalized treatment, then

$$R_1 = \begin{bmatrix} 0.679 & 0.302 & 0.019 & 0 & 0 \\ 0.547 & 0.396 & 0.567 & 0 & 0 \\ 0.472 & 0.434 & 0.094 & 0 & 0 \end{bmatrix}$$

$$B_1 = A_1 \times R_1 = (0.5566, 0.383, 0.2143, 0, 0)$$

After normalized treatment, then $B_1 = (0.482, 0.333, 0.185, 0, 0)$ ; similarly, Do single factor evaluation of $U_2$={ teaching process }, and then $B_1 = (0.476, 0.445, 0.075, 0.004, 0)$ ; Do single factor evaluation of $U_3$={ teaching effectiveness }, and then $B_1 = (0.480, 0.401, 0.119, 0, 0)$ .

Thus account for the general situation of teaching, the fuzzy relation matrix between evaluation index set and evaluation set is:

$$R_{\text{evaluating by students}} = \begin{bmatrix} 0.482 & 0.333 & 0.185 & 0 & 0 \\ 0.476 & 0.445 & 0.075 & 0.004 & 0 \\ 0.480 & 0.401 & 0.119 & 0 & 0 \end{bmatrix}$$

Meantime, the weight of the overall situation of teaching is: A=(0.3,0.4,0.3), then we can obtain the results of the teacher's teaching quality:

$$B_{\text{evaluating by students}} = A \times R_{\text{evaluating by students}} = (0.3, 0.4, 0.3) * \begin{bmatrix} 0.482 & 0.333 & 0.185 & 0 & 0 \\ 0.476 & 0.445 & 0.075 & 0.004 & 0 \\ 0.480 & 0.401 & 0.119 & 0 & 0 \end{bmatrix}$$
$$= (0.1479, 0.8772, 0.1212, 0.0016, 0)$$

After normalized treatment, then

$$B_{\text{evaluating by students}} = (0.1288, 0.7642, 0.1056, 0.0014, 0)$$

From the results of this calculation, the excellent calculation accounted for 12.88%, good evaluation accounted for 76.42%, and 10.56% evaluation for the medium, 0.14% evaluation for the pass, no one evaluated for the fail. As a result, the comprehensive evaluation of this teacher is good.

### 4.2 evaluation and calculation of "evaluating by co-teachers"

For the evaluation of teaching quality, evaluating by students is only on the one hand, it's can't be ignored to be evaluated by experts and college leaders from a professional evaluation. “Evaluating by co-teachers” is the mutual evaluation between each teacher, particularly, for the evaluation by experts and professors. The statistical results of the teaching general situation of a teacher are shown in table 3 after a survey of 12 experts

Table 3 evaluation statistics of "evaluating by co-teachers"

| Evaluation factors | excellent | good | Medium | pass | Fail |
|---|---|---|---|---|---|
| Teaching ideas, language expression | 8 | 4 | 0 | 0 | 0 |
| Theory accomplishment, moral cultivation | 10 | 2 | 0 | 0 | 0 |
| Professional knowledge | 6 | 6 | 0 | 0 | 0 |
| Teaching devices | 4 | 6 | 1 | 1 | 0 |
| Pedagogic method | 6 | 2 | 2 | 2 | 0 |
| The situation of teaching attitude, answering questions, correcting homework | 6 | 4 | 2 | 0 | 0 |
| The use of new knowledge | 8 | 2 | 2 | 0 | 0 |
| Students' professional knowledge increased significantly | 6 | 6 | 0 | 0 | 0 |
| Students' practical abilities enhance significantly | 8 | 4 | 0 | 0 | 0 |
| The students' creative thinking enhance significantly | 6 | 4 | 2 | 0 | 0 |

Use this method (the same as the evaluation calculation method of "evaluating by students ") to calculate, and then $B_{\text{evaluating by co-teachers}} = (0.5667, 0.3265, 0.0868, 0.020, 0, 0)$ .That is to say, from the results of this calculation, the excellent calculation accounted for 56.67%, good evaluation accounted for 32.65%, and 8.68% evaluation for the medium, 2% evaluation for the pass, no one evaluated for the fail. As a result, the comprehensive evaluation of this teacher is excellent.

### 4.3 comprehensive evaluation and calculation

“Evaluating by students” and “Evaluating by co-teachers” are carried out from different angles. Students' mastery of knowledge is the key to the teaching quality of teachers. Therefore, we need to integrate the results of two calculations and then obtain the final result. Students’ evaluation should be accounted for a larger proportion for the evaluation of teaching quality based on the proposals provided by experts. Set up the weight between students and experts: (0.6, 0.4).

$$R_{\text{Comprehensive evaluation}} = \begin{bmatrix} 0.1288 & 0.7642 & 0.1056 & 0.0014 & 0 \\ 0.5667 & 0.3265 & 0.0868 & 0.0200 & 0 \end{bmatrix}$$

$$B_{\text{Comprehensive evaluation}} = A_{\text{Comprehensive evaluation}} * R_{\text{Comprehensive evaluation}}$$

$$= (0.6, 0.4) * \begin{bmatrix} 0.1288 & 0.7642 & 0.1056 & 0.0014 & 0 \\ 0.5667 & 0.3265 & 0.0868 & 0.0200 & 0 \end{bmatrix}$$

$$= (0.3040, 0.5891, 0.0981, 0.0804, 0)$$

After normalized treatment, then

$$B_{\text{Comprehensive evaluation}} = (0.2835, 0.5496, 0.0915, 0.0754, 0)$$

From this evaluation result by 65 reviewers, the excellent calculation accounted for 28.35%, good evaluation accounted for 54.96%, and 9.15% evaluation for the medium, 7.54% evaluation for the pass, no one evaluated for the fail. As a result, the comprehensive evaluation of this teacher is good.

## 5. CONCLUSION

The evaluation of teaching quality is a complex system engineering, which involves a lot of methods. Thus it's very important to choose the method reflecting teaching quality of teachers objectively. Fuzzy comprehensive evaluation method makes those factors and indexes quantified appropriately by fuzzy transform, and the calculation process is simple relatively, it can also overcome the defect of the subjective evaluation by quantitative methods. Evaluation results can be the basis of professional titles evaluation and evaluation of outstanding teachers, it can also as an information feedbacks to school, as a reference for teaching quality improvement.

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# Analysis of Influence Factors about Consumer’s Trust in Baby Milk Quality and Safety

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Abstract: The consumer's trust in baby milk quality and safety is the important factor which affects baby milk consumption rebounding. Using the optimal scale model to Tangshan 326 consumer survey data as the foundation, we researched the influence factors of consumer’s trust on the safety of baby milk. The analysis results show that the consumer's trust to the government, company and milk station, the importance of baby milk to the family, age and family monthly income have positive significant effects on consumer’s trust. The vulnerable groups, brand, culture degree and the household spending on food have negative significant effects on consumer’s trust. Understanding of the Information and the consumer’s trust to farmers has no significant influence on consumer’s trust. Government must increase consumer’s trust in baby milk quality and safety through enhancing consumer's trust to the government, company and milk station.

Keywords: Baby Milk; Food Safety; Consumer’s Trust; Influence Factors; Optimal Scale Model

## 1. INTRODUCTION

With the improvement of living standards of residents in our country and the enhancement of health consciousness, dairy products have become more and more important in People's Daily life. Dairy products even have become the necessities of life. Since "Sanlu milk " incident happening, more and more baby milk quality problems have appeared. Since this year, according to People's Daily, there are 49 batches of milk powder is not qualified through the special supervision and sampling of infant formula powder by CFDA. These events have taken a negative effect on consumer’s trust in baby milk quality and safety.

In terms of consumer’s trust on food safety, Jnneke deJonge had a comprehensive research with the influence factors of consumer’s confidence in the relevant subject, consumer’s understanding of food safety incidents, individual characteristics and characteristics of social factors; [1] J.eJonge used decomposable regression model to have an analysis about the influence of specific factors, specific dimensions and specific factors of specific dimension to consumer’s trust on food safety; [2] Mei-FangChen adopted the method of psychological test, using the structural equation model, analyzed the consumer confidence in the food safety situation in Taiwan. [3]

There are many domestic researches on food safety use trust as the independent variable to study the effect of trust on a dependent variable. Overseas studies, because of the influence of culture, It cannot be directly applied in domestic. Because of this, this paper will use the survey data to have a research from the perspective of the consumer's trust in baby milk quality security. Using the optimal scale regression model, study the influence factors of consumer’s trust in baby milk quality and safety. The research focused on analyzing the factors influencing consumer’s trust. Such as consumer’s trust to the government, company, milk station and dairy farmers, some infant milk powder industry related subjects.

## 2. ANALYSIS FRAMEWORK

This research summarizes the influence factors of consumer trust as the following aspects:

1. The individual consumer characteristics. Individual features include consumers' gender, age, level of education, income level, personality, etc.
2. Consumer family characteristics. Consumers susceptible family characteristics including whether there is a baby milk consumer，infant milk powder and infant milk powder brand on three aspects to the importance of the family.
3. Consumer confidence in the relevant subject. This article infant milk powder industry related subjects include: government, infant milk powder production enterprise, milk station and dairy farmers.
4. Understanding of Information. In this paper, the information mainly include the following three aspects: understanding of events progress, understanding of the dynamic degree and understanding of the enterprise dynamic.

## 3.DATA SOURCES AND SAMPLE DESCRIPTION

### 3.1 data source

This study data is from the questionnaire survey, which is made by 15 students from North China University of Science and Technology, in May 2015. They carry out the research on the consumer’s trust in baby milk quality and safety in Tangshan. There are a 350 questionnaires issuing, and 338 questionnaires recycling. There are 326 questionnaires have no missing information and no obvious inconsistency.

From the perspective of the statistical results of respondents, the male accounts for 47.2%, the female accounts for 52.8%; Under the age of 30 accounts for 42.1%, 31 to 45 (40.2%), over the age of 45 (17.7%); Under the education of high school accounts for 38.1%, university education (48.8%), master's and above education (13.1%); Family monthly income under 4000 yuan accounts for 9.6%, 4000-7000 yuan (27.4%), 7000-9000 yuan (40.2%), above 9000 yuan (32.8%); There are 96.5% of households drinking well-known brand baby milk, 33% of households occasionally drink baby milk, 52.2% of households often drink baby milk, 14.8% of households drink baby milk every day, 38% of households have no susceptible population to drink baby milk.

3.2 consumer's trust on food security and other subjects

Consumer's trust in baby milk quality and safety and other subjects is not optimistic (from table 1). Consumer's trust to the government is the highest. There are 58% of consumers trust government, but there are still 42% of consumers are mistrust or between trust and distrust. Consumer's trust in baby milk quality and safety and other subjects mainly include `not completely trust`, `general trust`, `trust`, and each accounted for a third.

Table 1. consumer safety and general trust status subjects to the baby milk powder

| Project | distrust (%) | not completely trust (%) | general trust (%) | trust (%) | very trust (%) |
|---|---|---|---|---|---|
| Food security | 7.6 | 28.4 | 30.3 | 30.0 | 3.7 |
| Government | 5.2 | 13.0 | 23.8 | 40.8 | 17.2 |
| Enterprise | 6.5 | 20.1 | 39.0 | 28.6 | 5.8 |
| Milk station | 8.6 | 22.4 | 37.5 | 22.4 | 9.1 |
| Dairy farmers | 10.5 | 25.4 | 37 | 23 | 4.1 |

1. Consumer's trust in baby milk quality and safety maintains a reasonable level. Consumer's trust in baby milk safety distributes relatively evenly, `not completely trust`, `general trust` and `trust` are roughly the same proportion.

2. Consumer's trust to the government is at a higher level. To trust was the attitude of the government accounts for 57.7%, distrust (19.4%). It is probably because the government is in a very strong position. After the incident, there is mainly the information related to the government measures in the media. Consumers can understand the dynamics of the government immediately. Consumer's trust to milk station and dairy farmers is in a state of distrust. The trust was the attitude accounts for 27% and 30.7%. The information about them are too rare, and consumers cannot know the actual behavior of both.

4. MODEL SELECTION AND VARIABLE DECLARATION

4.1 model selection

According to the characters of this study's data, this paper chooses the optimal scale regression model to analyze. Here's why: Require variable linear regression model requests variables to be the numeric or at least be converted to the numeric. This is actually limit the measurement of variables is equidistant. But data of this study are orderly classification or more disorderly classification variables. If making "consumer trust" resolve for five levels, code for 1, 2, 3, 4, 5 as variables directly into the analysis. In fact, It is to assume that the gap between the 5-speed exactly equal. This is clearly a too ideal and simple hypothesis, and it could lead to a wrong conclusion. [4] As a result, this research data is not suitable for a general linear regression model. Optimal scale regression analysis is in the form of general linear regression model, but different from general regression analysis. It allows the dependent variable and (or) the independent variable for the various types of classification variables. This method changes the original conversion variables through adopting a certain nonlinear classification, and then repeated iteration until find the best regression equation. Thus there is a unique superiority in dealing with a categorical data. [5]

The general form of the optimal scale regression model is as follows:

$$y = \sum_{i=1}^{n} \alpha_i x_i + e$$

4.2 variable descriptions

1. The consumer trust. Consumer's trust is measured by "At the moment you feel how's the trust in the domestic baby milk quality and safety" , completing `distrust`, `not completely trust`, `general trust`, `trust` and `very trust` five grades. With the improvement of trust degree, variables are set to 1, 2, 3, 4, 5.

2. Individual consumer characteristics. Into the model analysis of their individual characteristics including sex, age, level of education, income and food expenditure level five variables.

3. Consumers family baby milk consumption characteristics. Variable vulnerable groups include two aspects of "is" and "no", which are set to 1, 0; Consumers family drinking baby milk brands are measured by "general brand" and "famous brand" two aspects. The variables are set to 1, 2. The importance of baby milk to the family is measured by `is not important, occasionally drink`, `more important, often drink` and `very important, every day to drink` three aspects. The variables are set to 1, 2, 3.

4. Consumer confidence in the relevant subject. Consumer's trust in the relevant subject is completely measured by `distrust` to `very trust` five grades. With the improvement of trust degree, variables are set to 1, 2, 3, 4, 5.Mainly including: the consumer’s trust to the government, company, milk station and dairy farmers.

5. Consumer’s understanding of information. Degree of consumer’s understanding of information is measured by the understanding of all kinds of information. In the information questionnaire, there are 8 baby milk information, 12 government measures information,15 company dynamic information provided.

4.3 result analysis

According to the regression results in table 2, the factors influence on consumer trust can be summarized as follows:

Table 2 , influence factors of consumer’s trust on the safety of baby milk

| Variable | original model | | the final model | |
|---|---|---|---|---|
| | coefficient | significance | coefficient | significance |
| Sex | -0.071 | 0.287 | | |
| Age | -0.109 | 0.021 | 0.103 | 0.019 |
| Cultural degree | -0.092 | 0.032 | -0.096 | 0.040 |
| Monthly family income | 0.319 | 0.013 | 0.318 | 0.009 |
| Household spending on food | -0.108 | 0.018 | -0.109 | 0.017 |
| Vulnerable groups | -0.215 | 0.012 | -0.215 | 0.011 |
| Drink brands | -0.307 | 0.241 | -0.311 | 0.238 |
| The importance to family | 0.126 | 0.024 | 0.128 | 0.023 |
| Degree of trust to government | 0.307 | 0.000 | 0.305 | 0.000 |
| Degree of trust to company | 0.241 | 0.000 | 0.218 | 0.000 |
| Degree of trust to milk station | 0.179 | 0.000 | 0.213 | 0.000 |
| Degree of trust to dairy farmers | 0.083 | 0.701 | | |
| Understanding of the latest developments | -0.054 | 0.421 | | |
| Understanding of the government dynamics | 0.537 | 0.000 | | |
| Understanding of the company dynamics | 0.198 | 0.002 | | |
| F | 7.010 | 0.000 | 7.331 | 0.000 |
| Correct $R^2$ | | 0.405 | | 0.425 |

1. In the influence of `Consumer’s understanding of information`, understanding of the company dynamic has a significant effect, understanding of the government dynamic has remarkable effect, understanding of developments has a significant impact. The mainly reason is that consumers think the company’s effective measures and the government's attention degree can make them enhance its trust in baby milk quality and safety. And the understanding of progress-going has less influence for consumers.

2. Vulnerable groups have a significant influence on consumer’s trust. The results show that the family who are susceptible population have a low consumer's trust in baby milk safety and quality. Because consumers think the food related with vulnerable groups should be intensive monitored. And consumers are very careful to choose and buy.

3. The brand have no significantly affects to consumer’s trust. The result shows that the consumers are not sensitive for baby milk brand whether is well-known or not. Many baby milk incidents happening has a negative effect for domestic baby milk. The consumer is not trust for all brands.

4. The importance to family has a positive significant effect. In other words, the family who often drink baby milk have the higher credibility to the quality and safety. It is because of that the consumers will buy a lot of baby milk when they can trust it. The survey results show that `the importance to family`, `the first and the second information-knowing` and `the change of consumption` have the significant correlation coefficient. For the families, the higher of the importance to baby milk, the less its consumption reducing.

5. The government, company and milk station's trust have a positive significant effect on consumers' trust. But for dairy farmers, there is no significant influence on consumer's trust.

6. According to consumers’ individual and family characteristics, `age`, `cultural level`,` family monthly income` and `monthly household food expenditure` have a significant influence on consumers' trust. But `sex` has no significant influence.

5. Conclusion

From the above analysis, we can get the following preliminary conclusions and policy implications:

1. After the food safety incident happening, consumers will have a higher trust, if they know the disposal measures. Therefore, the government

should take various ways to spread the main body‘s treatment in time, when the food safety incident happening. Finally we can achieve the goal and restore consumers' confidence.

2. The main body of government and company should always pay attention to the food safety guarantee measures. They should focus more attention on the daily security behavior rather than emergency measures. Therefore, the government and the company should be pay more attention to the sustainability of measures. In daily work, they should strengthen the monitoring of food quality and safety; Related information reports should be continued, and some important information should be further refined, which can make consumers have a channel to know the specific process in detail and enhance consumers' trust of information.

3. If the government wants to increase consumers' trust in baby milk, they must start with enhancing the trust of consumers to the government, company and milk stations, especially need to strengthen the supervision of brand-name products.

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# Study on Relationship between Transportation Hub and Land Development

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Abstract*:* Based on the related theoretical researches and practical experience from the domestic and overseas, this paper encircles the relationship between integrated transportation hub and land development, adopting the theory of differential equation, builds a mathematical model depicting the interacting relationship between traffic volume and land price/ between hub facility utilization and land resource use. Conclusion and proof were given that transportation hub facility and land use is to be interactive feedback relationship, which may provide the theoretic foundation for coordinating hub construction and land development. The paper illustrates the region optimization development makes hub has comprehensive benefits, taking the Hongqiao integrated transport hub as example. The study on Hongqiao hub validates the above theory and method and solves actual problem at the same time.

Key words: Hongqiao integrated hub transportation, Land development, Interactive feedback, Differential equation, Mode.

## 1. INTRODUCTION

Traffic and transportation in modern times produces profound effect to city development and city space evolution, the speed of traffic has become the most important value orientation[1]. The importance of Integrated transport hub is reflected in the use of traffic facilities itself, also reflected in promoting the surrounding areas planning of the transportation hub、the city's economic development and land use planning. Integrated transport hub is two or more than two kinds of transport means and traffic trunk road intersection and cohesion, requiring a variety of transport facilities and ancillary service function of organic synthesis for passengers or goods sending、transit、and arrive, which produces the "ripple effect" to the traffic hub, such as a stone thrown into the water[2]. Transit-oriented development theory guided by the public traffic (TOD) is first presented by Flake[3], who is an American architect. TOD theory thinks: (1) transport hub could eliminate traffic congestion, reduce the total transportation, which may become the industry cluster area and even become a new city center. (2) city development based on the TOD can produce marked positive feedback mechanism of "stream of people-service industry-stream of people", the assemble effect will cause the neighborhood of transportation hub quickly appearing manufacturing, logistics industry, commercial , catering services, exhibition services industry and high density residential community[4]. Foreign scholars have many research results on integrated transport hub theory and practice, for example, Schutz puts forward "three circle" theory, who thinks that the main effect of transportation hub on the surrounding regional is ten minutes walk away to reach the first level. Jan Jacb Trip argues that attention should be paid to the station and its space quality planning of surrounding regions, including the surrounding area planning and the station building design so as to prepare for attracting creative industry, the formation and development of integrated transport hub infrastructure improves the regional transportation conditions, its good accessibility plays the foundation to commercial facilities accumulation, makes the regional industry relocation, bring a lot of knowledge, information, communication technology. Thus, the integrated transport hub facilities is regional economic growth engine, which has a tremendous radiation effect and to surrounding regional development[5].

In classical economics, the land rent theory is main theoretical basis for the evaluation of land use, city planning depends on the rental value, each kind of land use types have the premium zone of corresponding payment ability. If a district accessibility level is high, it indicates that the area may have tended to be higher intensity of land use. Traffic system shows regional superiority and impact monetary value of land. Thus, a high traffic infrastructure level can ensure the land utilization and promote the development of a city[6].

On the other hand, comprehensive transportation terminal facilities construction and operation needs sufficient funds to support. Under the city land reserve system, land is the most effective resources for the hinge region. Reasonable land utilization can acquire the funds of integrated transport hub construction and operation to achieve balance and sustainable development of system. Furthermore, from the perspective of traffic planning, the different land use pattern determines the hub of the traffic structure and the comprehensive transportation hub distribution forms to a certain extent[7]. The unreasonable land use will cause that the traffic capacity cannot meet the traffic demand. In addition, rational land layout and location of facilities, through continuous construction and put into use, also can brings more and more convenient to transportation hub passenger and cargo flow[8]. The circulation and interactive feedback exists between comprehensive transportation hub and its surrounding land development, which interact influence each other, forming a complex system. The income of land development is foundation of comprehensive hub construction and regional sustainable development; while the hub of construction and operation affects the mode of land development.

## 2. INTERACTION MECHANISM BETWEEN TRANSPORTATION HUB AND LAND DEVELOPMENT BASED ON DIFFERENTIAL EQUATION

Comprehensive transportation hub and land development can both be represented by different characteristic parameters. The variables to describe the characterization of integrated transport hub are: traffic volume, hub structure, the spatial layout of the facility and so on; land development and situation variables are: land development, land utilization degree, land development intensity. The microcosmic mechanism between volume index reflects the feedback relationship between the comprehensive transportation hub and its surrounding land development from macroscopic angle. Because land reserve and development cost is easy to check, so the indicator of land development income can be instead of the land development prices; the intensity of land development is gradually increased along with the regional development, to some extent, the planning of regional development and the higher rate of development of higher strength, shows more sufficient regional land use[9]. The measure of comprehensive transportation hub and its surrounding land development from microscopic mechanism of interaction are shown in Tab.1.Tables and Figures are presented center, as shown below and cited in the manuscript.

Table1. The index of integrated transportation hub system and land development

| **Variables** | **Implication** |
|---|---|
| traffic volume | average daily passengers or goods |
| hub facility utilization | traffic volume/traffic capacity |
| land price | land price of hub area |
| land development intensity | developed area/total area |

### 2.1. Interaction Mechanism between Traffic Volume and Land Price

The relationship between traffic volume traffic of hub and land price give expression to interaction between integrated transport hub and land development at the microscopic respective.

Macro analysis shows that the construction of comprehensive transportation hub can improve hub traffic accessibility, thereby affecting the surrounding land value; under current land reserve mechanism, land value will influence the hub system benefits and affect the construction and development of comprehensive transport hub system. Thus, this paper uses the differential equation to analyze the relationship between traffic volume of hub and land price from the microscopic respective.

(1)Establishing mathematic mode of reflecting the relationship between traffic volume and land price. Hypothesize traffic volume of transportation hub is $x_1(t)$ at moment $t$, land price of transportation hub is $x_2(t)$ at moment $t$. Supposed,

① $x_1(t)$ 、 $x_2(t)$ is smooth function, and $x_1(t) > 0$、 $x_2(t) > 0$.

②the biggest traffic volume of its independent growth after construction of transportation hub is $X_1$, the highest land price of its independent growth under natural economy conditions in hub area, both of them are finite constant.

③the growth rate of hub traffic volume is $r_1$ ,the growth rate of hub land price is $r_2$, $r_1 > 0$、 $r_2 > 0$.

④the natural growth rate of hub traffic volume is $\lambda_1$, the natural growth rate of hub land price is $\lambda_2$.

⑤influence degree of hub traffic volume to land price is $\sigma_1$, influence degree of hub land price to traffic volume is $\sigma_2$, both of them are normal number.

Because land is scarce resources, its price growth rate is a normal constant $\lambda_2$ ( $\lambda_2 > 0$) without considering the effect of comprehensive transportation hub, the natural growth rate of land price is corrected to $\lambda_2(1 - x_2/X_2)$ considering the presence of growth impedance. In addition, the construction of integrated transportation hub certainly increases the land price, for the simplicity of analysis, supposed this growth of land price is proportional to the traffic volume of hub. Thus, the growth rate of land price is:

Similar discussion can be learned that the growth rate of traffic volume is:

$$r_1 = \lambda_1(1 - x_1/X_1) + \sigma_2 x_2$$

(2)

The differential equation between traffic volume and hub land price is:

$$\begin{cases} dx_1/dt = x_1\left[\lambda_1(1-x_1/X_1)+\sigma_2 x_2\right] \\ dx_2/dt = x_2\left[\lambda_2(1-x_2/X_2)+\sigma_1 x_1\right] \end{cases} \quad (3)$$

(2)Analysis of model stability

To research if interaction of traffic volume and land price have reached the point of balance and if equilibrium is stable, whether the model is stabe is required to be discussed, namely what is the tendency of $x_1(t)$ and $x_2(t)$ when $t \to \infty$. The right ends of two equations in the differential equations (3) are respectively set to 0, then the paper get the following algebraic equations:

$$\begin{cases} x_1\left[\lambda(1-x_1/X_1)+\sigma x_2\right]=0 \\ x_2\left[\mu(1-x_2/X_2)+\delta x_1\right]=0 \end{cases} \quad (4)$$

According to the stability theory of differential equations, the real root of algebraic equations (4) is balance point for differential equations (3), equilibrium solution is obtained as follows:

$$B_1(0,0),\ B_2(X_1,0),\ B_3(0,X_2),$$

$$B_4\left(\frac{\mu X_1(\lambda+\sigma X_2)}{\lambda\mu-\sigma\delta X_1X_2},\frac{\lambda X_2(\mu+\delta X_1)}{\lambda\mu-\sigma\delta X_1X_2}\right)$$

In order to make the problem has practical significance, each equilibrium point is required to be in the first quadrant of plane coordinate, Apparently only equilibrium point $B_4$ reflects the relationship between traffic volume and the land price, therefore this paper mainly focuses on stability analysis of the point $B_4$. The author requires $\lambda u > \sigma\delta X_1 X_2$ and analyzes whether point $B_4$ is stable on the phase plane, remember:

$$\varphi(x_1,x_2)=\lambda(1-x_1/X_1)+\sigma x_2 \quad (5)$$

$$\psi(x_1,x_2)=\mu(1-x_2/X_2)+\delta x_1 \quad (6)$$

The image plane( $x_1 \ge 0, x_2 \ge 0$ ) is divided into four areas( $Z_1, Z_2, Z_3, Z_4$ ) by the straight line $\varphi=0$ and $\psi=0$ ,which is shown in Fig.1.

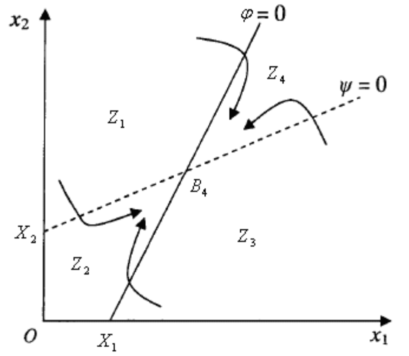

Figure.1 Stable okun's law of $B_4$

The four regional as shown in Figure 1 meet the requirement as follows:

$$dx_1/dt>0,\ dx_2/dt>0 \quad (7)$$

If the trajectory starts from region $Z_1$, with the increase of time $t$, trajectory will move to the right and have downward trends, then it tend to be $B_4$ or respectively entered the region $Z_2, Z_3, Z_4$.

If the trajectory starts from region $Z_2$, with the increase of time $t$, trajectory will move to the right and have upward trends, then it tend to be $B_4$ or entered the region $Z_4$ (it can be proved that the trajectory starting from region $Z_2$ will not enter the region $Z_1$ and $Z_3$ )

If the trajectory starts from region $Z_3$, with the increase of time $t$, trajectory will move to the left and have upward trends, then it tend to be $B_4$ or respectively entered the region $Z_1, Z_2, Z_4$.

If the trajectory starts from region $Z_4$, with the increase of time $t$, trajectory will move to the left and have downward trends, then it tend to be $B_4$ or entered the region $Z_2$ (it can be proved that the trajectory starting from region $Z_4$ will not enter the region $Z_1$ and $Z_3$ ).

The above analysis shows from whichever region the trajectory starts, it will tend to be $B_4$ when time $t \to \infty$. $B_4\left(\frac{\mu X_1(\lambda+\sigma X_2)}{\lambda\mu-\sigma\delta X_1X_2},\frac{\lambda X_2(\mu+\delta X_1)}{\lambda\mu-\sigma\delta X_1X_2}\right)$

Thus, the equilibrium point $B_4$ is stable, namely if only $\lambda u > \sigma\delta X_1 X_2$, the interactive evolution results of $x_1(t)$ and $x_2(t)$ can reach a stable equilibrium point $B_4$.

(1)the conclusion of mathematic model

The following conclusion can be drawn through above analysis: a mutual influence and interaction exists between traffic volume of the hub and land price, both of them promote each other, have the potential to reach a stable equilibrium state through feedback cycle. Through the construction of comprehensive transportation hub, the traffic volume expanding leads to improve regional accessibility of hub, the land price rises up, thereby it drives the integrated regional traffic volume increasing, then this interaction enters into the new cycle. The process is a positive feedback cycle, but such a positive feedback process cannot continue without limit, the renovation and expansion to increase its capacity is difficult when traffic facilities develops to a certain extent. The analysis of model is consistent with the real situation, so the differential equation model has certain explanatory for the relationship between traffic facilities and land development[10].

## 2.2. Interaction between hub facility utilization and land development intensity

The relationship of integrated transport hub facility utilization and land development intensity embodies interaction of integrated transport hub and land development at the microscopic level again[11]. As land development intensity increases, the comprehensive regional supporting facilities increasingly becomes mature, which improves the hub facility utilization and further enhances the regional development land value, further promoting land development; if there is no hub facilities construction, the hub land development intensity will be lower than the other plots of the city. $x_1(t)$ indicates integrated transport hub facility utilization and $x_2(t)$ indicates land development intensity at time $t$; the biggest hub facility utilization of its independent variation after construction of transportation hub is $X_1$, the greatest land development intensity of its independent variation under natural economy conditions in hub area; the variance ratio of hub facility utilization is $r_1$,the variance ratio of land development intensity is $r_2$; ④the independent growth rate of hub facility utilization is $\lambda_1$, the independent growth rate of land development intensity is $\lambda_2$; influence degree of hub facility utilization to land development intensity is $\sigma_1$, influence degree of land development intensity to hub facility utilization is $\sigma_2$.

Using similarity modeling principle, the paper establishes interaction mechanism model of the hub facility utilization and land development intensity:

$$\begin{cases} dx_1/dt = x_1\left[\lambda_1(1- x_1/X_1)+\sigma_2 x_2\right] \\ dx_2/dt = x_2\left[\lambda_2(-1+ x_2/X_2)+\sigma_1 x_1\right] \end{cases} \quad (7)$$

The author analyzes what is tendency of $x_1(t)$ and $x_2(t)$ when $t \to \infty$, equilibrium solution of formula (8) is obtained as follows:

$$B_1(0,0),\ \mathrm{B}_2(X_1,0),\ \mathrm{B}_3(0,X_2),$$

$$B_4\left(\frac{\mu X_1(\lambda+\sigma X_2)}{\lambda\mu-\sigma\delta X_1 X_2},\frac{\lambda X_2(\mu+\delta X_1)}{\lambda\mu-\sigma\delta X_1 X_2}\right)$$

In order to make the problem has practical significance, each equilibrium point is required to be in the first quadrant of plane coordinate, Apparently only equilibrium point $B_4$ reflects the relationship between hub facility utilization and the land development intensity, therefore this paper mainly focuses on stability analysis of the point $B_4$. The author requires $\lambda_2 > \sigma_1 X_1$ and analyzes whether point $B_4$ is stable on the phase plane, which is shown in Fig.2.

From Fig.2 shows interaction of hub facility utilization and the land development intensity can reach an equilibrium position if only their interaction effect is not exorbitant when $\lambda_2 > \sigma_1 X_1$.

The average land development intensity is $\lambda_2 X_1(\lambda_1+\sigma_2 X_2)/[\lambda_1\lambda_2+\sigma_1\sigma_2 X_1 X_2]$ under stable equilibrium state which is greater than the value of its independent development, namely when the hub facility utilization rate reaches a certain level, land development intensity of hub regional will increase, however, land development intensity exceeding a certain extent will bring about the problems of traffic congestion, which causes regional accessibility to decrease, then marginal profit of land use also drops, which makes land development of hub region be restrained.

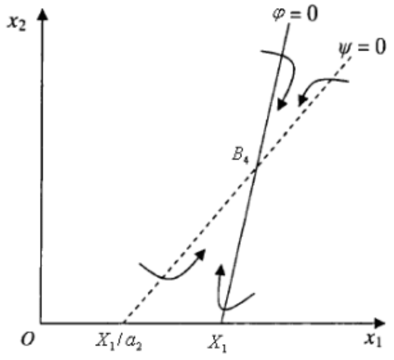

Figure.2 Stable okun's law of $B_4$

## 3. Study on Optimization Development of Hongqiao Transportation Hub Region

Shanghai Hongqiao integrated traffic hub project is the key projects during "Eleventh Five-Year" plan period, which will become a large modern integrated transport hub closely connecting high-speed railway, intercity and city rail transits, buses, taxis and airports after it is built. Various means of transportation and multiple transfer modes of Hongqiao integrated transport brings enormous passengers flow and traffic flow, which makes it not only have the function of transportation hub, but also have certain synthesis with economic function.

Objectives of optimization development of Hongqiao integrated transportation hub region can be reduced to the following two points: ① to supply cash so that the facility of hub region can be successfully developed and constructed; ② regional development of the hub obtains better beneficial result. To ensure the supply of funds, through study on optimization development mode of the region of Hongqiao hub development and construction activities of the hub region can continue under capital balance. The author only study economic benefits of the regional development.

According to the plan, hub area 26.26 square kilometers is divided into three parts. One part is the airport and the main terminal of eastern region; traffic facilities lie in the central region; the western region is the major development zone, an area of about 5562 acres. Land development project investment income balance, mainly refers to land development of the western development zone, therefore, the object of study is developing zone of the western zone.

①The overall pattern of land development

Hongqiao integrated transport hub is a comprehensive, large-scale comprehensive hub, the staging rolling development and operation mode is appropriate for it.

②Functional subareas

According to the hub area land use planning of Hongqiao integrted transportation, developing zone of the Western zone mainly is divided into three parts which are communal facilities, buildings which helps settle down persons whose houses are demolished during hub construction and green land. Among them, communal facilities are mainly commercial office space, such as commercial offices, hotels, trade consulting exhibition area, an peripheral area of about 3665.14 acres, centralized public green area is about 796.5 acres; residential relocation in planning lies the scope of the north and west sides, an area of about 922.5 acres.

③The type of project development

Business district of the Hongqiao hub highly attract modern industrial agglomeration relying on air passengers, railway passengers such as business, exhibition, hotel, retails, restaurants, which makes Shanghai become professional services cluster. It also indirectly drives the development of surrounding areas related to modern service industry, stimulates interaction between modern service industry of suburb areas and the city center, promoting transformation of regional economic.

④The development cycle

This paper calculates regional development cycle of Hongqiao hub using the formula as follows: $N = \left[Y - (1-X)F_r\right] / XF$ .Where $F$ = for the Hongqiao project investment company of its own funds ratio, a value of 65%; $r$ = the bank loan interest rate, a value of 6.14%; $Y$ = capital return rate of the hub development, a value of 12.26%; the planning preliminarily estimates that regional development of Hongqiao hub needs about 120000000000 Yuan, for the item company, project total investment is 63400000000 RMB, then $X$ =634/1200=0.528.Therefore, the development cycle of Hongqiao hub is 5years, according to the development cycle, the development time of the hub is 10 years, for 5 periods considered, then regional staging development is two years for a cycle.

⑤The sequence of development

The development cycle of Hongqiao hub is 5years and public construction area can be divided into 4 regions to be developed and constructed, the land index of hub region are shown in Tab.2. Among which, volume ratio indicator is weighted average value of regional land development planning volume ratio; unit area income of land development is weighted average value of land benefits of all types.

Table2. Land Index of Hub Communal Facilities（Unit:Square Kilometers）

| **number** | **region** | **area** | **ratio** | **land development income per unit area (ten thousands yuan)** |
|---|---|---|---|---|
| 1 | Business and offices | 1.31 | 2.45 | |
| 2 | Airport facilities and storage area | 0.67 | 1.20 | 24.3 |
| 3 | Gas station and parking area | 0.023 | / | 69.6 |
| 4 | The industry of education and medicine | 0.12 | 0.94 | 65.3 |

Table3. The Development Capacity of Hub Region per Construction Period（Unit:Squarekilometers）

| | $A_1$ | $A_2$ | $A_3$ | $A_4$ | $A_5$ |
|---|---|---|---|---|---|
| $B_1$ | 0.15 | 0.24 | 0.26 | 0.31 | 0.38 |
| $B_2$ | 0.21 | 0.17 | 0.13 | 0.08 | 0.08 |
| $B_3$ | 0.02 | / | / | / | / |
| $B_4$ | / | / | 0.02 | 0.06 | 0.04 |

The paper reasonably distributes four areas whose development period is ten years and makes the total development benefits are better. According to the land development timing calculation method, the author uses the simplex method to optimize the land development time and region. The result is shown in Tab.3.

The configuring solution shown in Table 3 is an equilibrium result of land development time, location optimization and development period. The actual calculation shows test number of isolated nonbasic variable (the isolated spaces in Table 3) is zero, which means the scheme shown in table 3 is only one of many prioritization solutions .

The author applies multiple objective linear programming model to the Hongqiao comprehensive traffic hub region development optimization calculation, The expected economic benefits and benefits after various balance are shown in Tab.4.

Table4. Economic benefits level

| **Objective** | **Economic benefits（one billion）** |
|---|---|
| The expectation level cap | 50.14 |
| The expectation floor level | 33.73 |
| The consultative level cap | 48.06 |
| the consultative floor level | 32.33 |

## 4. Summary

Close feedback interaction exists between the integrated transportation hub and regional land development. The construction of comprehensive transportation hub in the region improves the traffic accessibility and stimulates land value increment; land development of integrated transport hub area promotes regional supporting facilities, so as to increase traffic volume of the integrated traffic hub and improve the utilization rate of facilities. Such views provides basis for coordinating the relationship between hub construction and land development. Taking the Hongqiao integrated transport hub as example, The author thinks land value increment can balance construction investment of Hongqiao hub and land reserve quantity gradually decreases according to different compensation time point. In addition, commercial facilities of Hongqiao hub have good operating efficiency, which can balance annual operating costs of hub. The study on Hongqiao hub validates the above theory and method and solves actual problem at the same time.

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# Chinese Hi-tech Enterprise Qualification Examination and Accreditation through the Lens of Fairness and Reciprocity Theory

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Abstract: Taking into consideration of the fairness and reciprocity preference theory, this paper constructs fairness and reciprocity game models for Chinese Hi-tech enterprise qualification examination and accreditation, while analyzing the game equilibriums between the government and the applicants for Hi-tech enterprise qualification. The result shows: firstly, Nash equilibrium can be reached if both the government and the applicant place are concerned with the psychological utility value obtained from a fair game. Secondly, the establishment of a credit system for Hi-tech enterprise is vital for achiving maximum social welfare. Lastly, by increasing the reward payment for truthful applicants, increasing the cost of producing fake applications, reducing the cost of submitting truthful applications, and advocating for a stronger supervision of all applications, the government can significantly lower the number of firms that choose to fake their applications for Hi-tech enterprise qualification.

Keywords: fairness and reciprocity game;Hi-tech enterprise; qualification examination; qualification accreditation

## 1. INTRODUCTION

Technological innovation has now become a mantra. For winning their future, all countries have to increase their innovation capacity[1]. In China, Hi-tech enterprise generally means that the enterprise, which has the sustainable ability of R&D and transformation of technological achievements, can form core independent intellectual property. A lot of research has been conducted on Hi-tech enterprise ; the majority focuses on innovation outcomes[2], innovation organizations[3], knowledge management[4,5], enterprise strategies[6] and human resources[7,8]. In fact, few studies have been done in the field of high tech enterprise identifications. In China, the government plays an important role in firms' innovation processes by establishing supportive policies and making institutional arrangements[9]. In recent years, the government aims to further enhance the level of innovation by offering businesses financial support. More and more enterprises have started to identify themselves as Hi-tech enterprises so that they can enjoy the benefits from government subsidies. Therefore, the challenge faced by the government today is how to identify the true Hi-tech enterprises from the fake ones.

The fairness and reciprocity theory originated from academic journals written by Kahneman[10] and Rabin [11]. This theory demonstrates that game subjects not only focus on their own interests but also pay attention to fairness and reciprocity. In the construction of the fairness and reciprocity theory, Kahneman uses prospect theory instead of expected utility theory to effectively combine psychology with economics. Using Kahneman's research as foundation, Rabin applies the notion of fairness in game theory into the field of economic analysis. Stating from Charness and Rabin's "social preference" model [12], followed by Dufwenberg and Kirchsteiger's reciprocity model [13], and then the development of the fairness and reciprocity theory [14-16], together led to an important branch of the game theory[17,18]. Using this game theory, Xu [19] constructs a traditional game model and a fairness and reciprocity game model for the government and the applicants. Meanwhile, Tang [20] gives the reciprocal function that reflects reciprocity equilibrium concept, using the reciprocal game model to apply in the employment relationship of labor economics.

Existing academic journals have shown that few researchers have applied fairness and reciprocity theory to Hi-tech enterprise qualification examination and accreditation. However, we believe that all subjects have reciprocity motivation in the identification process of Hi-tech enterprise. Unlike most scholars in their game analysis, in our research we have decided to introduce fairness and reciprocity theory in the implementation of Hi-tech enterprise policy.

For the Chinese Hi-tech enterprise qualification examination and accreditation, we have built fairness and reciprocity game models of the government and the applicants of Hi-tech enterprise qualification, bringing utility value of fairness and reciprocity into the game models. With the fairness and reciprocity game models, we study the resulting Nash equilibriums to explore the various methods that could enhance our current system of Hi-tech enterprise qualification examination and accreditation in China.

## 2. ANALYSIS OF FAIRNESS AND RECIPROCITY GAME MODEL

Most economic models based on the self-interest hypothesis believe that all people are exclusively motivated by their material desires. However, experimental economists have gathered abundant evidence that refutes the self-interest hypothesis. As a matter of fact, many people are not only concerned with their own interests, but are also motivated by the notion of fairness and reciprocity. Based on similarities and differences between various models of fairness and reciprocity theory, we mainly give credit to Kohler [21] and Ottone [22] for the following theoretical figure of fairness and reciprocity game models (Figure 1):

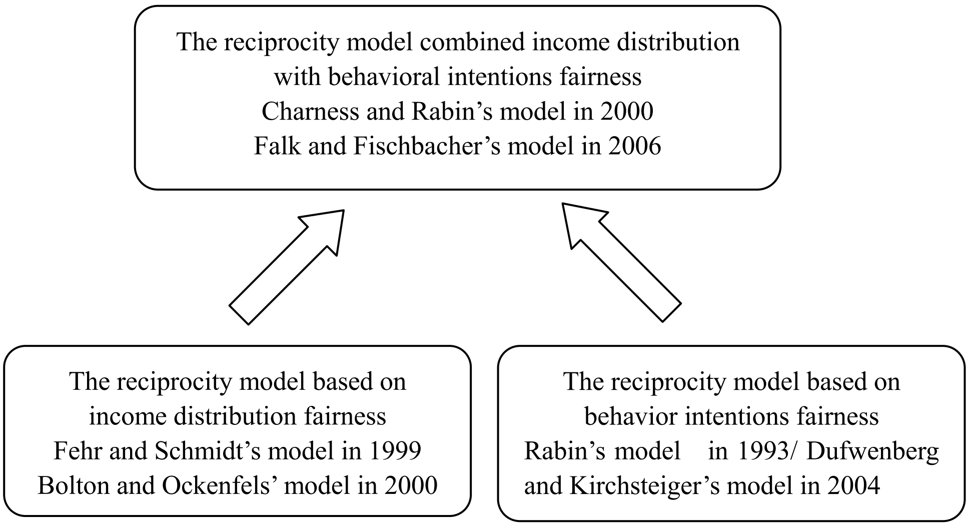
The reciprocity model combined income distribution with behavioral intentions fairness
Charness and Rabin's model in 2000
Falk and Fischbacher's model in 2006
The reciprocity model based on income distribution fairness
Fehr and Schmidt's model in 1999
Bolton and Ockenfels' model in 2000
The reciprocity model based on behavior intentions fairness
Rabin's model in 1993/ Dufwenberg and Kirchsteiger's model in 2004

Figure1. Fairness and reciprocity game models

### 2.1 THE RECIPROCITY MODEL BASED ON INCOME DISTRIBUTION FAIRNESS

Fehr and Schmidt [23] assume that if the payoff for a player is equivalent to that for others around him, then he is altruistic relative to other players. If the payoff for other players is more than what is given to him, he will feel jealous. In most experiements, the assumption is that all player have the same money assignment. Fehr and Schmidt have used the simplest utility function to express this viewpoint.

Bolton and Ockenfels[24] have developed a similar inequity aversion model. Their research also shows that these models can explain a lot of seemingly contradictory evidence. For example, it can explain the giving behaviour in the DGs and GEGs model and the refusing behavior in the UGs model.

### 2.2 THE RECIPROCITY MODEL BASED ON BEHAVIOR INTENTIONS FAIRNESS

Rabin [11] defines a "kindness function", which measures the degree of kindness for player $i$ to player $j$. If $i$ believes in his opponent's selection strategy $b_j$, then he will choose his opponent payoff from $[x_j^l(b_j), x_j^h(b_j)]$. Here, when $j$ choose $b_j$, $x_j^l(b_j)$ and $x_j^h(b_j)$ are the minimum and maximum payoffs of $j$ which is induced by $i$.

Player $i$'s utility is the sum of n terms. The first term is his material payoff, the remaining terms express his reciprocity payoff with respect to each player $j \neq i$. The constant $Y_i$ measures how sensitive $i$ is to the level of reciprocity.

### 2.3. THE RECIPROCITY MODEL COMBINING INCOME DISTRIBUTION AND BEHAVIORIAL INTENTION FAIRNESS

Charness and Rabin [12] believe in a specific form of altruism called quasi-maximin preferences. They also claim that this quasi-maximin preferences model can introduce demerit profile to analyze preferences, but here, $\rho_i \in [0,1]$ measures the value of player $i$ from the perspectives of all the other players. The smaller the $\rho_i$, the higher the value of $i$ in the other players' utility functions. Given demerit profile $\rho$, the player $i$'s utility function is as following:

$$U_i(x_1, x_2, \ldots, x_N \mid \rho) = (1-\gamma)x_i + \gamma[\delta \min\left\{x_i, \min\left\{x_j + d\rho_j\right\}\right\}$$
$$+(1-\delta)(x_i + \sum\nolimits_{j \neq i} \max\left\{1-k\rho_j, 0\right\} x_j) - f\sum\nolimits_{j \neq i} \max \rho_j x_j]$$

In the function above, $d, k, f \geq 0$ are three new model parameters. If $d = k = f = 0$, it simplifies to the quasi-maximin preferences.

Based on their experimental data, Falk and Fischbacher [25] stated that human difference aversion and reciprocity preference cannot be ignored.

### 2.4 COMPARATIVE ANALYSIS OF MODELS

Comparing with the models above, Rabin's fair game model [11] can only be applied to games involving two players. Charness and Rabin [12] and Falk and Fischbacher [25] have attempted to construct a simple model that integrates two different intentions, but the results have not been satisfactory. In comparison, Fehr and Schmidt's game model [23] with fewer parameters, which is based on the standard game theory, is not only easier to operate but can also be applied to a wider range in qualitative and quantitative anlysis.

## 3. FAIRNESS AND RECIPROCITY GAME MODELS OF HI-TECH ENTERPRISE QULLIFICAITON EXAMINATION AND ACCREDITATION

### 3.1 FAIRNESS AND RECIPROCITY EQUILIBRIUM EVALUATION OF HI-TECH ENTERPRISE QUALIFICATION EXAMINATION AND ACCREDITATION

The fairness and reciprocity evaluation principle of Hi-tech enterprise qualification examination and accreditation is that fairness and reciprocity evaluation should focus on the fairness and reciprocity conduct of quasi-maximin preferences between the government and the applicant. Inequity aversion indicates that the government and the applicant of Hi-tech enterprise are inclined to avoid offensive inequity results. For instance, they are willing to give up some material benefits to achieve a fairer result. Fehr and Schmidt's model [23] does not give up a rational assumption, but rather uses a utility function to combine the two seemingly contradictory concepts of fairness and self-interest [26].

Referring to Fehr and Schmidt's analytical model, this paper introduces the fairness and reciprocity equilibrium evaluation formula of strategic value of Hi-tech enterprise qualification examination and accreditation. The fairness and reciprocity evaluation formula is given by

$$U_i(x) = x_i - \alpha_i \frac{1}{n-1}\sum_{j\neq i}\max\{x_j - x_i, 0\} - \beta_i \frac{1}{n-1}\sum_{j\neq i}\max\{x_j - x_i, 0\} \tag{1}$$

Where $n$ represents the number of individual, $U_i(x)$ represents the total utility of $i$, $i \in (1,2,3,\cdots,n)$, and $x_i$ represents $i$'s material utility, $x_j$ represents $j$'s material utility, $\alpha_i \geq \beta_i$ and $0 \leq \beta_i < 1$.

In the game between the government and the applicant of Hi-tech enterprise, we can simplify the formula to:

$$U_i = x_i - \alpha_i \max\{x_j - x_i, 0\} - \beta_i \max\{x_i - x_j, 0\} \tag{2}$$

This utility function shows that total utility value of either the government or the applicant of Hi-tech enterprise includes not only the individual player's own utility but also the utility gap between the two players, which can be seen as the decrease of the utility due to the inequity. Note that $0 \leq \beta_i < 1$ because if $\beta_i \geq 1$, the government or the applicant of Hi-tech enterprise will find that his total utility level will increase when he throws away a unit of utility value. But this is not realistic. $\alpha_i \geq \beta_i$ shows that even though the material utility value of the government or the applicant is more or less than each other, they will still view the game as unfair. In general, the government or the applicant has a stronger sense of unfairness when his utility level is at disadvantage than he does at advantage.

Assuming the government is $i$, the applicant of Hi-tech enterprise is $j$.

If the government($i$)'s material utility is lower than the applicant of Hi-tech enterprise ($j$), that is $x_j - x_i \geq 0$, then the government($i$)'s total utility function is given by

$$U_i = x_i - \alpha_i(x_j - x_i) \tag{3}$$

If the applicant of Hi-tech enterprise ($j$)'s material utility is lower than that of the government($i$), i.e. $x_i - x_j \geq 0$, then the government($i$)'s total utility function is given by,

$$U_i = x_i - \beta_i(x_i - x_j) \tag{4}$$

Therefore, the government($i$)'s utility, his total utility can be represented by the sub-function of the applicant of Hi-tech enterprise ($j$)'s material utility $x_j$ as shown below.

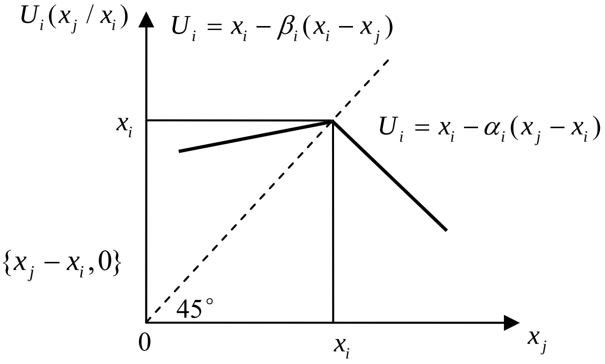

Figure2. the material utility function of $i$ and $j$

Obviously, when $x_j = x_i$, the government($i$) maximizes its total utility value. Compared to when $x_j < x_i$, the government($i$)'s total utility decreases at a faster rate when $x_j > x_i$. That is to say, utility at a disadvantage brings a stronger sense of unfairness than does utility at an advantage.

### 3.2 FAIRNESS AND RECIPROCITY GAME MODEL OF HI-TECH ENTERPRISE QUALIFICATION EXAMINATION

Under the assumptions of self-interest, both the government and the applicant of Hi-tech enterprise will seek for cost minimization. If government subsidies for innovation can be obtained, the applicants of Hi-tech enterprise qualification can reduce their cost of inputs. Therefore, more and more enterprises have the tendency to fabricate Hi-tech enterprise qualification conditions. The government is still offering subsidies to support enterprises that meets Hi-tech enterprise qualification, but it is becoming increasingly strict about the amount of subsidy payment. As a result of this self-interest model, neither of the two sides is implementing strategic behavior to increase social welfare. However, in reality, both sides often pay more attention to social fairness and reciprocity while making decisions that can increase their material gains.

### 3.2.1MODEL

In the game model of Hi-tech enterprise qualification examination, the government and the applicant of Hi-tech enterprise qualification are the two players. The government has two strategies, which are strict examination and easy record. There are two types of applicants: those that meet Hi-tech enterprise conditions and those that do not. As shown in Figure 3, to achieve the objective of maximizing social welfare, or, in other words, reaching the strategic equilibirum state (strict examination, truthful application), is very difficult.

From the perspective of fairness and reciprocity game, this trap of self-interest can be avoided. When the government and the applicant of Hi-tech enterprise qualification make a contribution that promotes social welfare, harmony, and stability, we can assign a psychological utility value to their contribution. Thus, in this new psychological game that takes fairness and reciprocity into consideration, a state of equilibrium (strict examination, truthful application) can be achieved.

Based on relevant literatures that have game models of two players, we have constructed a fairness and reciprocity game model between the government and the applicant of Hi-tech enterprise qualification. In this game, the players not only seek material interests, but also consider their psychological utility value when determining whether or not a conduct is fair. If we disregard the psychological aspect, both players are likely to choose strategies that maximize their own interests. But if both players take social justice into consideration, then they are most likely to be willing to give up some material benefits to achieve fairer competition results [$^2$7].

| | | The applicant of Hi-tech enterprise qualification | |
|---|---|---|---|
| | | Truthful application | Fake application |
| The government | Strict examination | $\underline{E\text{-}S\text{-}C}, \underline{F+S\text{-}c(1)}$ | $\underline{e+S+R-C}, -R-f-c(0)$ |
| | Easy record | $-e-S, \underline{f+S-c(1)}$ | $-E-S, S-F-c(0)$ |

Figure3. Fairness and reciprocity game model of the government and the applicant of Hi-tech enterprise qualification examination

In the fairness and reciprocity game between the government and the applicant of Hi-tech enterprise qualification, when both players apply strict examination and truthful application strategy, they can both get a large increase in psychological utility value $E$ and $F$. On the contrary, when the two players use lax examination and false application strategy, they will have a large decrease in psychological utility value $E$ and $F$. When only one of the players is willing to express a sense of fairness, he will get a small increase of pschological utility value( $e$ or $f$ ), and the other will lose a small amount of psychological utility value ( $e$ or $f$ ). In short, depending on how each of the players values and measures fairness, the strategic combination (strict examination, truthful application) may become the ultimate choice for the government and the applicant.

In addition, $c(1)$ is the truthful applicant's cost of Hi-tech enterprise application. $c(0)$ is the cost of producing fake application. It isn't difficult to see that $c(0) > c(1)$. $C$ is the cost of the government's strict examination (for simplicity, let's assume that the cost of the government's easy record is 0), then the government will only have an incentive to use strict examination when $E > C$. Moreover, $S$ is applicant's rent subsidies. In this case, the truthful applicant will only apply for Hi-tech enterprise qualification when $S > c(1)$. In addition, the existing "free rider" phenomenon shows that $S > c(0)$. As a result, we have shown $S > c(0) > c(1)$. $R$ is the fine on fake applicant if detected.

### 3.2.2 EQUILIBRIUM ANALYSIS

According to the game model above, we can see that no matter the applicant of Hi-tech enterprise qualification is truthful or not, as long as the government implements strict examination strategy, in which the large psychological utility value $E$ and the small psychological utility value $e$ satisfy the following relationship,

$$E - S - C > -S - e \tag{5}$$

that is $E > c - e$ (according to the analysis earlier, we can get $E > C$ ), then $E - S - C > -S - e$ must be true. Thus, the Nash equilibrium (strict examination, truthful application) is achieved.

The game analysis is as follows: firstly, assuming that the government strictly examines Hi-tech enterprise applicant, the applicant's truthful application is the optimal choice. When the government uses lax examination, the applicant's truthful application is still the optimal. Secondly, if you assume that the applicant truthfully applies for Hi-tech enterprise qualification, the government's strict examination is the optimal strategy. When the applicant fakes an application, the optimal strategy for the government is strict examination. In this game, pure strategy Nash equilibrium exists: strict examination and truthful application.

## 3.3`FAIRNESS AND RECIPROCITY GAME MODEL OF HI-TECH ENTERPRISE QUALIFICATION ACCREDITATION

From the pure strategy Nash equilibrium above, we have demonstrated that in the process of Hi-tech enterprise qualification examination, applicants are likely to fake their applications when the government does not have an effective examination. Thus, next we will establish a fairness and reciprocity game model for Hi-tech enterprise qualification accreditation.

### 3.3.1MODEL

First, let's assume that the result of the government's strict examination can be viewed as a valid supervision, and lax examination as invalid. The applicant who applies for Hi-tech enterprise qualification is risk neutral. He has two strategies: truthful application and fake application, denoted by (corresponding to their level of credibility) $a = 1$ and $a = 0$. $c(a)$ represents the cost function. The utility function is as follows,

$$u(w,a) = w - c(a) \tag{6}$$

where $w$ is the benefit of the applicant of Hi-tech enterprise qualification from the government ; its meaning is broader than that of $S$.

Economic benefits of the applicant applying for Hi-tech enterprise qualification come from the monetary benefits $S$ given by the government, and its social benefits consist of some intangible benefits, such as the improvement of the corporate image as a result of the Hi-tech enterprise qualification. These intangible benefits can be viewed as the fairness and reciprocity psychological utility value, $F$.

Assume that in addition to detecting whether the applicant fakes an application, the government has no other methods of rewarding or punishing the applicant. Thus, besides providing a fixed amount of subsidies, the government cannot provide any more benefits to incentivize the applicants. If $p$ is the probability that the government detects the applicant's fake application, then the payoff matrix of the applicant is as shown in Figure 4.

| | | The applicant of Hi-tech enterprise qualification | |
|---|---|---|---|
| | | The applicant true application | The applicant fake application |
| The government | The government's supervision is valid（p） | $w-c(1)$ | $w_0-c(0)$ |
| | The government's supervision is invalid（1-p） | $w-c(1)$ | $w-c(0)$ |

Figure4. Fairness and reciprocity game model of Hi-tech enterprise qualification accreditation

Corresponding to the above fairness and reciprocity game matrix of Hi-tech enterprise qualification examination, it shows that when the government effectively supervises truthful applicant of Hi-tech enterprise qualification, $w = S + F$. Similarly, when the government ineffectively supervises truthful applicant of Hi-tech enterprise qualification, $w = S + f$. And when the government effectively supervises fake applicants (detects fake application), $w_0 = -R - f$. Similarly, when the government ineffectively supervises fake applicants, $w = S - F$.

From the payoff matrix, we can see that if the applicant apply truthfully, the total utility is $w - c(1)$. If the applicant fakes the application, its total utility is $p(w_0 - c(0)) + (1-p)(w - c(0))$. Note that the applicant's credit rating is $(a = 1)$ rather than $(a = 0)$ only if the following conditions are true :

$$w - c(1) > p(w_0 - c(0)) + (1-p)(w - c(0)) \tag{7}$$

$$w(p) > w_0 + \frac{c(1) - c(0)}{p} \tag{8}$$

An applicant's participation constraint is that a truthful application's benefits are greater than costs, that is, $w - c(1) > 0$. This is a prerequisite and has nothing to do with the government's effectiveness of supervision. If the cost of a truthful application is too large, then fabricating an application will be the applicant's most rational choice.

$w(p) > w_0 + \frac{c(1) - c(0)}{p}$ (incentive compatibility constraint) suggests that it is impossible for the government to have complete supervision of all applicants ( $p < 1$ ). In order to induce the applicants to submit truthful applications, the benefits paid by the government must be greater than the reserved benefits.

From $w - c(1) > p(w_0 - c(0)) + (1-p)(w - c(0))$, we can see that when $p$ approach $0$, which is when the government does not recognize the strategic behavior of the applicant, the incentive compatibility constraint from the applicant's truthful application is converted into $c(1) - c(0) < 0$. That is to say, when the fake application's cost is greater than that of the truthful application, the applicant will choose truthful application. In reality, the cost of fake application is less than the cost of truthful application, $c(1)-c(0)>0$ . This is the reason why many applicants submit fake applications.

When $w_0$, $c(0)$ and $p$ are given, the higher the applicant's truthful application cost( $c(1)$ is greater), the more the benefit that the government has to pay. Otherwise, the applicant will choose to fake his application.

When $c(1)$ , $c(0)$ , $p$ are given, the smaller the $w_0$ (when the government increases the penalties for fake applications), the less the benefits paid by the government to truthful applicants.

Let

$\Delta p = w+(c(1)-c(0))/p-(w+c(1)-c(0))=(c(1)-c(0))(1-p)/p$ .

This shows that the "gains from fake application" are included in the benefits for the applicant, that is to say, compared to when under full supervision, when supervision probability is $p$ the government pays the applicant an additional benefit. Obviously, you can see that the worse the supervision is ( $p$ is smaller), the more "gains from fake application" is paid by the government.

3.3.2EQUILIBRIUM ANALYSIS

In the model above, we assume that the probability $p$ is a given fixed number. Now, let's consider how to determine the appropriate $p$ when $p$ is a variable.

Let's assume that the government can spend more time and money to increase the probability $p$ of fake application detection. $m(p)$ is the cost function of $p$ , and $m'(p)>0$ , $m''(p)>0$ and $m(0)=0$ , $m(1)=\infty$ . $m'(p)>0$ indicates that if the government wants to increase the probability of fake application detection, it has to pay a higher cost; $m''(p)>0$ shows that the marginal cost of $p$ is increasing; $m(0)=0$ means that the probability of fake application deteaction is $0$ when there is no investment in supervision; $m(1)=\infty$ means that the cost is infinite when the probability of fake application detection is 1.

In this case, the government agent cost is composed of two parts: gains of fake application and the cost of supervision. The government minimizes the total cost by selecting $p$.

$$AC(p)=\frac{1-p}{p}(c(1)-c(0))+m(p) \qquad (9)$$

The optimal first-order condition is as follows:

$$\frac{\partial AC(p)}{\partial p}=-\frac{1}{p^2}(c(1)-c(0))+m'(p)=0 \qquad (10)$$

where $\frac{1}{p^2}(c(1)-c(0))$ is the marginal revenue of increasing $p$ , and $m'(p)$ is the marginal cost of increasing $p$. Optimization means marginal revenue equals marginal cost (Figure 5).

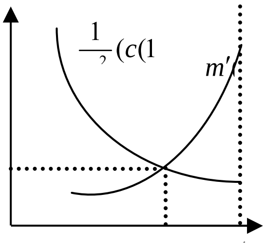

Figure5. The optimal level of supervision

From the analysis above, we can see a positive correlation between the validity of government supervision and the applicant's active control strategies.

4. CONCLUSION

The main conclusions are as follows.

(1) From the analysis of fairness and reciprocity game model for Hi-tech enterprise qualification examination, we can conclude that if both the government and the applicant are care about the psychological utility value obtained from fairness, both players will ultimately reach pure strategy Nash equilibrium (strict examination, truthful application).

(2) We can interpret psychological utility values $E$ , $F$ , $e$ and $f$ as the fair reciprocal utility values from the establishment of a Hi-tech enterprise credit system. Thus, it is essential to create a Hi-tech enterprise credit system.

(3) From the analysis of the fairness and reciprocity game model, there are three ways for the government to lower the number of fake applications for Hi-tech enterprise qualification: first, the government can increase the benefit given to truthful applications; second, the government can increase the cost of fake applications and reduce the cost of truthful applications; third, the government can use a more effective supervision system to increase the probability of fake application detection.

It has been a real challenge seeking ways to achieve rationalization of Hi-tech enterprise examination and accreditation. Currently, most research studies have largely ignored subjects' psychological behavior. This article integrates notions of fairness and reciprocity into Hi-tech enterprise examination and accreditation, constructs game models for Chinese Hi-tech enterprise qualification examination and accreditation, and finally conducts a model equilibrium analysis while taking fairness and reciprocity into consideration. This study is different from those of the past because it is more relevant to the actual situation of Hi-tech enterprise in China today. Future research on Hi-tech enterprise can select the actual data to make an empirical analysis of the implementation results in Hi-tech enterprise examination and accreditation.

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# Research on the index system construction of the hardware facilities of Cultural Industry Park Assessment Based on AHP method

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Abstract: This article from the 7 dimensions of location, area, property services team, health care facilities, educational facilities, living facilities, office and other facilities of the detailed design of the 33 specific indicators of Cultural Industry Park hardware facilities of comprehensive evaluation, based on AHP model (AHP) established the assessment index weight. The results show that the hardware facilities of Cultural Industrial Park evaluation index system construction is mainly embodied in three dimensions, covers an area of cultural and educational facilities and geographic conditions, but also should be taken into account in the other four dimensions.

Key words: Cultural industry; Hardware facilities; Evaluation index; AHP; Weights

## 1. INTRODUCTION

The cultural industry is one of the most popular and most complex industry, twenty-first Century is the most promising and the most potential sunrise industry". In the process of development of cultural industries, cultural industry park is one of the important carrier of the development of cultural industry, he can provide a good environment for the development of cultural industry, to provide all kinds of space and place for cultural and creative talent agglomeration and the residents in the park.

In the process of the construction of Cultural Industry Park, both from the hardware point of view or from the park park function index, innovation index, capital driven index and Park Economic and social benefits, is a complicated system engineering anomaly. In this context, many scholars put forward by constructing evaluation index system to study the development and evaluation of cultural industry cultural industry park performance, and effectively guide and stimulate the comprehensive development of the cultural industry. But after finishing the literature found that scholars of cultural industry park construction evaluation index system are almost from the qualitative perspective, the subjective components are lack of quantitative data, objective and strict. In addition, the scholars in the construction of Cultural Industry Park evaluation index system, the hardware index of the park is overlooked, hardware index layer division is too general and not detailed, there is no in a scientific and objective basis to give weights, which resulted in the lack of park construction hardware facilities assessment data.

In the quantitative analysis method, the traditional DEA method, VRIO method, the gem method, input output method in the culture industry evaluation index system although it is often used, but not used in the evaluation system of park facilities. This is because first of all, the traditional evaluation methods focus on the evaluation of single dimension, it is difficult to fully reflect the cultural industry in the total growth, industrial structure, social contribution, technological innovation, cultural park residents to enhance the quality of multi-dimensional performance; secondly, in the Cultural Industrial Park evaluation system, but also very few separate qualitative and quantitative analysis with the park hardware facilities evaluation system of scholars; in addition, the traditional evaluation method cannot effectively and dynamically the outcome indicators and motivation indicators, to realize the combination of dynamic Park hardware facilities and other indicators. Therefore, this study introduces the AHP method of the performance evaluation and strategic management tool to separate the cultural industry evaluation index system for construction of hardware facilities.

## 2. THE COMPOSITION OF THE EVALUATION INDEX SYSTEM OF THE HARDWARE FACILITIES OF THE CULTURAL INDUSTRY PARK AND THE DESCRIPTION OF THE VARIABLES

The cultural industrial park is a kind of spatial organization form or institutional arrangement which is used to obtain the value of cultural goods by means of cultural and creative activities. It more coordination and interaction of "zone", and not "garden" of a single development, it is industrial cluster effect and community residents, life and art integration of a "regional", not only the pursuit of cluster size, should pay attention to the community cooperation, enhance the consumption level of residents of cultural products and cultural literacy, in addition to the need to pay attention to the production of cultural products of art and feature. Based on the above definition, this paper designs including location, area, property services team, health care facilities, educational facilities, living facilities, office facilities and other 7 dimensions, a total of 33 specific indicators of the evaluation index system of

Park Hardware (as shown in Table 1):

Tab.1 dimension and specific cultural industry park of hardware evaluation indicators

| One dimension | Secondary dimension | The three dimensions (specific indicators) |
|---|---|---|
| A | B | C |
| A Cultural Industrial Park Hardware index | B1 geographic conditions | C1 Distance from the city center main business circle |
| | | C2 Convenience of public transport |
| | B2 area covered | C3 afforested area |
| | | C4 Parking lot area |
| | | C5 Outdoor leisure, sports and entertainment area |
| | | C6 Natural or artificial body of water area landscape |
| | | C7 Office area |
| | | C8 Area of public service |
| | | C9 Living area |
| | B3 Property services team | C10 Total number of services |
| | | C11 All the staff of the proportion accounted for Park |
| | | C12 The number of managers |
| | | C13 By the government or industry association management award number |
| | B4 Health care facilities | C14 Health Service Center |
| | | C15 Park medical service facilities |
| | B5 Health care facilities | C16 The school (Senior Education Entertainment) |
| | | C17 Kindergarten, primary and secondary schools |
| | | C18 Children and Youth Activity Center |
| | | C19 Culture and Art Center |
| | | C20 Sports fitness center |
| | B6 Home living facilities | C21 The number of supermarkets |
| | | C22 Convenient 24 hours the number of pharmacies |
| | | C23 Number of banks (including self-service bank) |
| | | C24 The number of Park Restaurant stores (including all kinds of special snack shop) |
| | | C25 Bookstore and music, film and television products shop number |
| | | C26 A number of other life service center (including dry cleaning shops, bars, shopping center etc.) |
| | B7 Office and other facilities | C27 Cloud computing import |
| | | C28 Office sharing database |
| | | C29 Shared Lab |
| | | C30 Broadband access capacity (including home) |
| | | C31 Number of communication equipment |
| | | C32 (Security) monitoring equipment |
| | | C33 Other technical equipment |

1.1 Location conditions

The location conditions include the distance to downtown main business circle distance and public transportation two indicators. The cultural industry park and the city center distance should not be too far apart, or affect the cultural industry to promote the development of creative city. In addition, the convenience of public transportation is a very important index, because the park production and living, leisure, entertainment and other functions into one, public transportation is more likely to attract ordinary people to visit, consumption, the formation of aggregation, lay the foundation for the realization of "network" comprehensive park function better.

1.2 Floor area

The narrow area of land occupied by a single building or the use of the land level projection area. The understood in a broad sense, refers to the inside of the park's total land area, including green area, parking field (Office) area, public service establishments are deposited area, the landscape water area of outdoor leisure, sports, entertainment area area, natural or artificial dig, office and living area and other seven indicators composition. The definition of cultural industry park for culture industry cluster effect and community residents, life and art combines an integrated regional patterns, so covers an area of sub dimension design of specific indicators in addition to select usually Industrial Park listed in the office area and area of the public service establishments, also selected indicators such as life is closely related to the area and outdoor recreation, sports and entertainment area and community residents living in, this is in order to better play the function of the nature of Cultural Industry Park, finally promote the development of creative cities.

### 1.3 Property services team

Property services team includes the total number of services accounted for all of the staff, the proportion of park managers, by the government or industry association management award number four indicators. Property services team in the park facilities should not be ignored. This is because the fundamental property services on the service, is to provide the humanized service of high quality, efficient and quick for employees and residents of the business park, which is the foundation and guarantee of stable and rapid development of the park.

### 1.4 Health care facilities, educational facilities and living facilities

Health care facilities include two indicators of health service and medical service facilities park. The health service center that is designed for the park staff and owners to carry out the main places of health management, including health testing room, record room, counseling rooms and other places; Park health services mainly refers to the medical consulting room common pharmacy, transfusion room, B ultrasonic room, Department of dental etc.. Educational facilities include sunset red school, nursery school, the number of children and Youth Activity Center, arts and cultural activities center, fitness center and other five indicators. Because of the cultural industry park is closely related with culture, to achieve a particular geographical region industry scale and cultural production and consumption combined, so cultural education facilities in the park infrastructure construction is particularly important. An important function in the park is to cultivate Park residents' cultural level of appreciation, in order to promote the city residents' cultural literacy education, and accelerate the construction and development of creative city. Living facilities include a number of supermarkets, convenient 24 hour pharmacy quantity, the number of banks (including self-service bank), the number of Park Restaurant stores (including snack shop), the number of bookstores and music, film and television products, the number of shops in other life service center (including dry cleaning shops, bars, shopping malls and other six indicators). Due to the location of cultural industry park is a distinctive cultural image and produce a certain geographical area to attract the production, trade, leisure and living as one of the many functions to the outside world, so the cultural industrial park and Industrial Park, the logistics park is different, in the hardware facilities construction should give full consideration to the residents in the park whether supporting facilities.

### 1.5 Office and other facilities

Office and other facilities including cloud computing, database sharing, sharing office into the inter laboratory number, broadband access capacity (including household), communications equipment (Security) units, monitoring equipment and other technical equipment units and a total of seven indicators to measure. The index is more for the enterprises in the park to provide technical support services.

## 2 Cultural industry park facilities evaluation index weight set

### 2.1 AHP weight determination principle and its basic calculation steps

In this paper, the AHP model (Hierarchy Process AHP Analytic) is used as the analytic hierarchy process to establish the weight of the index. AHP is a decision method which is based on the analysis of the elements that are always related to the decision, such as the target, the criterion, the plan and so on. The method is the operational research experts at the University of Pittsburgh Professor Saaty in the early 1970s, the American Department of defense "according to the contribution of each industrial sector of the welfare state and distribution of electric power project, according to the theory of network system and multi-objective comprehensive evaluation method, proposed a hierarchical weighted decision analysis method. Standard 80 years from the 20th century at the beginning of the method was introduced into our country since many domestic scholars on the improvement and Perfection: the left Army according to Saaty's 1 ~ 9 scaling method to construct the matrix more difficult, and puts forward the 0 ~ 2 three standard degree method; Xu 0 ~ 2 standard degree method based on the - 1 ~ 1 the three scale method and - 2 - 2 scaling method; subsequently, Shu Kang put forward the index scale method; Wang Hao the 9 / 9 (fraction scaling method and 10 / 10 18/2 fraction method Hou Heng Yue the scaling method is proposed to index method. Specific to this paper, the main use of Satty scoring criteria for calculation, the steps are as follows:

#### 2.1.1 Constructs and determines pairwise comparison matrices

According to the Satty score standard, the ratio of the importance of any two indexes is divided into 1 to 9 grades (as shown in Table 2):

Tab.2 SATTY criteria

| Contrast scoring | Relative importance | explain |
|---|---|---|

| | | |
|---|---|---|
| 1 | Equally important | Line index and column index with the same |
| 3 | Slightly important | For the index contribution degree is slightly more than the column index |
| 5 | Fundamental importance | The contribution degree of the line index is greater than the column index |
| 7 | Important determination | The contribution of the line index was significantly greater than the column index |
| 9 | Absolutely important | For more than the absolute level of index contribution index |
| 2、4、6、8 | Two the intermediate value of the adjacent degree | The need to compromise when |

By the expert consultation method, after repeated discussions and comparisons of the 33 specific indicators, the results of the final results were compared. According to the relative importance of the specific indicators, a pairwise comparison judgment matrix $\left(W_{n\times n}\right)$ is obtained and the initial weight coefficient of $\left({}^{'}i\right)$ is calculated:

$$W_{n\times n}=\left(a_{ij}\right)_{n\times n} \quad (1)$$

$$^{'}i=\sqrt[m]{a_{i1}.a_{i2}...a_{in}} \quad (2)$$

2.1.2 Calculation of judgment matrix

To construct and identify the pairwise comparison matrix was normalized, and then calculate the maximum eigenvalue and normalized vector matrix:

$$\lambda_i=\sum_{j=1}^{m}a_{ij}\,w_j/w_i \quad (4)$$

Feature vector:

Maximum feature vector:

$$\lambda_{max}=\sum_{i=1}^{m}\lambda_i/m \quad (5)$$

**2.1.3 Consistency test**

Consistency checking, calculation checking coefficient CR and consistency index CI

$$\begin{cases} CI=\left(\lambda_{max}-n\right)/\left(n-1\right) \\ CR=CI/RI \end{cases} \quad (6)$$

Where n is the order of matrix. CR for consistent measurement of different order matrix to determine whether it is satisfied; when the CR≤0.1, can be considered the consistency of judgment matrix is satisfied, or need to re adjust the judgment matrix. When n≤2, there is no need to carry out the consistency test. For the 9 to 1 order judgment matrix, the average random consistency index of the judgment matrix is introduced to the RI standard (shown in Table 3):

Tab.3 RI values mean random consistency index

| Matrix order | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| RI | 0.00 | 0.00 | 0.58 | 0.90 | 1.12 | 1.24 | 1.32 | 1.41 | 1.45 |

2.2 The calculation of the weight of the evaluation index of the hardware facilities of the Cultural Industrial Park

2.2.1 Weight calculation of secondary dimension index

Because there is only one evaluation index of the first order, and no need to calculate the weight, the index of the second dimension is calculated. Through the comparison of the relative importance of the seven elements in the secondary dimension, a two two comparison judgment matrix is obtained:

$$W_{7\times 7}=\begin{bmatrix} 1 & \frac{1}{2} & 3 & 3 & 1 & 2 & 3 \\ 2 & 1 & 3 & 3 & 2 & 2 & 4 \\ \frac{1}{3} & \frac{1}{3} & 1 & \frac{1}{2} & \frac{1}{4} & \frac{1}{2} & 2 \\ \frac{1}{3} & \frac{1}{3} & 2 & 1 & \frac{1}{2} & 1 & 2 \\ 1 & \frac{1}{2} & 4 & 2 & 1 & 2 & 4 \\ \frac{1}{2} & \frac{1}{2} & 2 & 1 & \frac{1}{2} & 1 & 2 \\ \frac{1}{3} & \frac{1}{4} & \frac{1}{2} & \frac{1}{2} & \frac{1}{4} & \frac{1}{2} & 1 \end{bmatrix}$$

For the $W_{7\times 7}$ calculation, it is concluded that the maximum feature vector is $\lambda_{max}$=7.1693, and the normalized feature vector is $CR=0.0207\leq 0.1$ $\overline{W_B}=(0.1960,0.2764,0.0664,0.0974,0.2008,0.1109,0.0523)^T$ ·

2.2.2 Weight calculation of three dimension index

Through the comparison of the specific indicators of each level of the three dimensions of each level to compare scoring, get the judgment matrix of the three dimensions, weight, special

The data and the test coefficient are as follows:

Location condition dimension C1-C2 index $\overline{W_{C1-C2}}=\left(0.6667,0.3333\right)^T$, because n≤2, so no need to carry out the consistency test, covers an area of dimension C3-C9 index $\overline{W_{C3-C9}}=\left(0.1225,0.0676,0.1747,0.1433,0.0824,0.1298,0.2797\right)^T$ , $\lambda_{max}=7.2281, CR=0.0279\leq 0.1$ ; property service team dimension C10-C13 index $\overline{W_{C10-C13}}=\left(0.2047,0.2895,0.0965,0.4094\right)^T$ ,

$\lambda_{max} = 4.1213$，$CR = 0.0454 \le 0.1$ ; Dimensions of health care facilities, C14-C15 index, $\overline{W_{C14-C15}} = (0.4925,0.5075)^T$ , because n ≤ 2, Therefore, there is no need to carry out the consistency test; Cultural and educational facilities, C16-C20 index, $\overline{W_{C16-C20}} = (0.1213,0.2427,0.1601,0.3473,0.1285)^T$ , $\lambda_{max} = 5.1137$，$CR = 0.0254 \le 0.1$ , Home living facilities dimension C21-C26 index, $\overline{W_{C21-C26}} = (0.2297,0.1624,0.1352,0.0956,0.2894,0.0876)^T$ , $\lambda_{max} = 6.2908$，$CR = 0.0462 \le 0.1$ ; Office and other facilities dimension C27-C33 index, $\overline{W_{C27-C33}} = (0.2363,0.2719,0.1451,0.0922,0.0884,0.0977,0.0685)^T$ , $\lambda_{max} = 7.3725$，$CR = 0.0456 \le 0.1$ .Three dimensions (specific indicators) of the weight and the index of importance ranking see Table 4

Tab.4 Cultural industry park of hardware evaluation index weight and sorting

| One dimension | | Secondary dimension | | The three dimensions (specific indicators) | | |
|---|---|---|---|---|---|---|
| A | Weigh | B | Weigh | C | Weigh | sort |
| A Cultural Industrial Park Hardware index | 100 | B1 geographic conditions | 19.60 | C1 Distance from the city center main business circle | 13.07 | 1 |
| | | | | C2 Convenience of public transport | 6.53 | 4 |
| | | B2 area covered | 27.64 | C3 afforested area | 3.37 | 11 |
| | | | | C4 Parking lot area | 1.86 | 20 |
| | | | | C5 Outdoor leisure, sports and entertainment area | 4.94 | 5 |
| | | | | C6 Natural or artificial body of water area landscape | 3.94 | 9 |
| | | | | C7 Office area | 2.27 | 18 |
| | | | | C8 Area of public service | 3.57 | 10 |
| | | | | C9 Living area | 7.69 | 2 |
| | | B3 Property services team | 6.64 | C10 Total number of services | 1.36 | 24 |
| | | | | C11 All the staff of the proportion accounted for Park | 1.92 | 19 |
| | | | | C12 The number of managers | 0.64 | 29 |
| | | | | C13 By the government or industry association management award number | 2.72 | 14 |
| | | B4 Health care facilities | 9.72 | C14 Health Service Center | 4.84 | 8 |
| | | | | C15 Park medical service facilities | 4.88 | 6 |
| | | B5 Health care facilities | 20.08 | C16 The school (Senior Education Entertainment) | 2.44 | 17 |
| | | | | C17 Kindergarten, primary and secondary schools | 4.87 | 7 |
| | | | | C18 Children and Youth Activity Center | 3.22 | 12 |
| | | | | C19 Culture and Art Center | 6.97 | 3 |
| | | | | C20 Sports fitness center | 2.58 | 15 |
| | | B6 Home living facilities | 11.09 | C21 The number of supermarkets | 2.55 | 16 |
| | | | | C22 Convenient 24 hours the number of pharmacies | 1.80 | 21 |
| | | | | C23 Number of banks (including self-service bank) | 1.50 | 22 |
| | | | | C24 The number of Park Restaurant stores (including all kinds of special snack shop) | 1.06 | 26 |
| | | | | C25 Bookstore and music, film and television products shop number | 3.21 | 13 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | C26 A number of other life service center (including dry cleaning shops, bars, shopping center etc.) | 0.97 | 27 |
| | | B7 Office and other facilities | 5.23 | C27 Cloud computing import | 1.24 | 25 |
| | | | | C28 Office sharing database | 1.42 | 23 |
| | | | | C29 Shared Lab | 0.76 | 28 |
| | | | | C30 Broadband access capacity (including home) | 0.48 | 31 |
| | | | | C31 Number of communication equipment | 0.46 | 32 |
| | | | | C32 (Security) monitoring equipment | 0.51 | 30 |
| | | | | C33 Other technical equipment | 0.36 | 33 |

### 2.3 Analysis on the evaluation index and weight of the hardware facilities of the Cultural Industrial Park

In accordance with the ranking of the weight, the second dimension index in turn for covers an area (0.2764), culture and education facilities (0.2008), location (0.1960), at home living facilities (0.1109), health care facilities (0.0972), property services team (0.0664) and office and other facilities (0.0523). The area of evaluation is very important in the index system in the hardware, this is because of the cultural industrial park is a large integrated regional integration of cultural creative industry cluster effect and the community, the residents of life and art, is a pioneer leading creative city development, which requires the park in addition to comprehensive functions have complex certainly, in the area covered by various types of land demand; cultural and educational facilities after the area, which fully embodies the characteristics of Cultural Industry Park as the community residents living and leisure, but also the realization of cultural consumption, to attract and retain key customers and residents of the park; the traditional evaluation methods usually ignore location condition assessment but they are the key dimensions of cultural industry park facilities to ensure the evaluation is essential for Su. A successful cultural industry park needs the strong support of the local city culture, with geographical space larger dependence, which determines the park is not far away from the city center, in order to enable non Park residents can easily enter the park cultural consumption and enhance the cultural level of the whole city. Home living facilities, health care facilities, property services team and office and other facilities in the hardware facilities evaluation index system in four. This is not to say that the four evaluation dimensions is not important, because the function and characteristics of the cultural industry park is a combination of industrial cluster and community residents, life and art, in addition to the pursuit of cultural industry cluster size, should pay attention to with the community, park residents and staff of the normal living facilities security. With the "12th Five-Year" in China's cultural industry from extensive development stage and gradually shift to the meaning of the stage of development, the four dimensions of the importance of indicators will be more and more high.

In accordance with the ranking of the weight, important specific indicators (three dimensions) including the distance from the city center business circle distance (0.1307), the living area 0.0769, culture art activities center 0.0697, public traffic convenience (0.0653) and outdoor recreation, sports, entertainment area area (0.0494) etc.. These important indicators are mainly concentrated in the area, location, cultural and educational facilities and other three aspects, in line with the real needs of the hardware facilities and development of China's cultural industry parks at the present stage, namely in the realization of cultural industry agglomeration effect based, so that the park tend to be more with the characteristics of "zone": to meet the needs of community residents, as well as shaping the invisible image space, community residents and other consumers in the material, the function space of desire generation, consumption and imagine and construct a comprehensive living area.

## 3. CONCLUSION

This essay, starting from the specific characteristics of the hardware facilities of the cultural industry park, from seven aspects, design the corresponding evaluation index system, and uses the AHP (analytic hierarchy process) model to determine the index weight, the results showed that covers an area, cultural and educational facilities, the condition of location and three index occupies a very important position. That in the cultural industry park preliminary planning or construction, the key consideration covers an area of, three indicators of cultural and educational facilities and location conditions whether the target, in addition to other indicators can also be as a cultural industry park hardware instruction and evaluation in the reference standard, thus for Cultural Industry Park in the future development direction and provide decision making in hardware support, and guide the cultural industry embarked on scientific development path.

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# Study on the Entire Process of Sports Spirits Integrating into School Talents Cultivating

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Abstract: It is very important for school to cultivate talents. Various measures must be taken if sports spirits need return to the school talents cultivation, which includes teaching sports spirits such as “diligence and aggressiveness”, “fair competition”, “union and cooperation”, “law-abiding”, “exploration and innovation” etc. Traditional sports teaching methods need to reform, and the school sports culture construction should be strengthened, and the selection of excellent PE. Teachers must be done from thorough investigation among the school students.

Key words: Physical Education; Talent Cultivation; Education Reform

## 1. INTRODUCTION

In the 21st century, science and technology are developed rapidly, which make the rapid growth of the economy; meanwhile, it let humans fall into the ideology of individualism, hedonism, and money-worshiping. Sometimes, faced with the material temptation, people distort their values often fall into the abyss of materialism. The brilliant parts of human nature such as conscience, morality, virtue, justice and humanity fade away. Human's rational keenness for science and technology led to the loss of humanistic spirit in modern education. For the current school education, due to the universe pursuit for science and technology and utilitarian in society, the construction of humanistic spirit is ignored, which results in the lack of humanistic spirit in school education: malignant phenomena happened frequently, for instance, some students in colleges commit suicide, even, few students just killed cruelly their roommates for trivial matters. Maybe, current education has neglected the most essential things, in other words, it has ignored the humanistic spirit of educates. Educates, as persons, education are a human-centered world. However, for a long time, our education focused on the teaching of more knowledge and skills, but ignored the cultivation of the spirit of the people. At present, there is a lack of humanistic education [1-3].

In the teaching activities, the school focuses on the student's test subjects the major subjects which weigh heavily in the exam. The utilitarian of knowledge is only emphasized, but insufficient emphasis is put on the cultivation of students' personality; much attention is paid on the teaching of scientific knowledge, but the cultivation of humanistic quality is ignored. The tendency of education not only weakened the humanistic education, but also weakened the education in primary and secondary schools, even will leave a lot of troubles for future education, especially, the dogmatic and rigid teaching methods may kill the students' interest and wisdom [4, 5]. The Students accept only knowledge negatively, losing their right to choose, thus, a lively discussing atmosphere will be hard to form in class. This education does not respect the students' personality, dignity and right, but regard the students as passive, lifeless and accepting objects, which is a education lacking in humanistic care. Throughout the long history of human education, all countries regarded physical education as an important part of the cultural heritage of human. Coubertin once said, "The ancient Greeks organized the competitions not just for physical exercise, but also for the education of people".

## 2 THE COMPONENTS OF COLLEGE SPORTSMANSHIP

### 2.1 fair competition

The principle of openness, justice and fairness is the core of the Olympic spirit, which requires people to obey the rules and regulations, and fair competition in sports competition.

### 2.2 diligence and aggressiveness

In Sports competition, the athletes must make every effort, and beat the opponents violently. Faced with difficulties and setbacks, they should be persevere and brave to combat, and strike to make themselves stronger. In the face of the enemy, they need to keep positive attitudes, not fearing the strong, exploit their own potential and be perseverant. They should hold the belief that they will defeat his opponent. Also, they can’t underestimate the enemy event if the opponents appear to be weak, not be blindly arrogant. Under any circumstances, they should keep active and devote themselves to the competitions, otherwise, they may fail.

### 2.3 law-abiding spirits

Nothing can be accomplished without norms or standards.

In sports events, regardless of differences in ability, race, color, nation, culture and language, all competitors must not ignore the rules but obey the common “game rules” strictly. The spirit of law-abiding can be fully embodied in sports.

### 2.4 union and cooperation

In competitive games, especially the events for which union and cooperation is must, every player can care about their own interests too much if they hope to achieve the overall victory. They must also keep the same common aim, be united, be diligent and cooperating, and be responsible. The players should cooperate with each other and try to be tolerant to their teammates and trust them.

### 2.5 exploration and innovation

The motto “Swifter, higher, stronger" can reflect a spirit of innovation in sports well. Competition can promote innovation. People keep continuous innovation in action skills and the difficulties to make more and greater progress. They also keep going beyond the limitation and keep innovative in such aspects as sports means, sports methods and ports concept. Only by this way can they achieve greater goal.

## 3 THE SIGNIFICANCE OF SPORTS SPIRIT IN THE UNIVERSITY TALENTS TRAINING

School is an important place for students to study; schooldays are also one of the most important periods of their life. During this stage, students are mature and sound in physiology and psychology gradually. Therefore, it is more important to strengthen the training of the sports spirit when the talents are cultivated for schools

### 3.1 sports are helpful to cultivate students' strong will and positive and optimistic attitude.

The attitude of hard work toward life is very precious in the fierce social competition. If a person hopes to succeed, he or she must never give in facing difficulties, dare to struggle, and fight with hardships violently. Which are just what modern Chinese students are lacking? Many of them are in poor will. They are too weak to bear psychological pressure, when encountering hardship, they choose giving-up and setbacks, or to ask their parents for help. In sports, victory or defeat is common, but as long as they don’t give up and keep working hard, they will experience the joy of success. Therefore, we can always feel the sun and confidence from those who love sports. Sports can not only give participants a optimistic attitude towards life, and also make the students experience the saying “No cross, no crown “by the competitive course full of hardships and sweat, frustration, which is of positive significance to the growth of current students, because through sports, they can be physically strong, event be stronger in spirit not afraid of failure, not afraid of difficulties, optimistic and work hard, and struggle bravely.

### 3.2 sports help to cultivate students' awareness and behavior in fair competition.

Fair competition is an important foundation to ensure social order and sustainable development. Therefore, it is a very important duty for school to make students have the awareness of fair competition and stick to it in practice. As is known to all, in any events, everyone is required to stand in the same starting line, obey the common rules, accept a unified judge and be equal without privileges. Therefore, the students can fully enjoy the openness, fairness, justice by participating in sports. Through repeated practice, this awareness of fair competition will continue to be strengthened so that the habits of fair competitive behavior will be formed.

### 3.3 sports help students form a cooperation spirit of collectivism.

Nowadays, knowledge and technology is changing and developing, much work in different fields can be not completed by individuals but be divided properly and be completed in group. This cooperation ability should be trained through certain means and the way in the student stage. it is too late for the students to realize its importance after obtaining their jobs,. Sports, especially the collective projects, requires a lot of cooperation, in the course of participating in the collective project, students can gain and improve their ability in cooperation.

### 3.4 sports help to promote the socialization of students.

Socialization is a topic that people pay attention to for a long time, whose research is more thorough. The function that sports promote socialization has been widely accepted. In sports, the students need to play different roles such as a member, a judge, a guide, an audience and even coaches in different situations. These roles are similar to some in real life. Therefore, students can experience different social roles and improve their social adaptability greatly.

### 3.5 sports help to cultivate students' creative spirit and ability.

Innovation is the soul of a nation I and provides endless power for the prosperity and flourish of the nations. Therefore, how to cultivate students' innovative ability is a very important topic. Physical educe action is an important part of school education, where the open learning environment and site is available. When learning about sports, students can fully observe, think, practice and perform there, which can take incomparable advantage over other subjects in improving the students’ ability of innovation? In addition, there is a positive spirit and a adventurous one that breaks through the limit in the sports. This spirit can help stimulate students' creative potential so that student’s ca n gain greater improvement in innovation ability in every challenge.

## 4 THE MEASURES ON THE SPORTS SPIRIT‘S RETURN TO THE UNIVERSITY TALENTS CULTIVATION

4.1 reform the traditional teaching methods in physical education in Colleges and universities to arise students' interest in class

Class teaching in physical education in school mainly includes the courses in theory and skills. Explanation of theory course is a comprehensive interpretation of the theory of sports, which should focus on the deep connotation of the sports spirit and help to improve the students' Ideological understanding. The practice of the skill course can make the ideological understanding practiced. The two teaching forms are equally important, however, to a great extent, the teaching effect depends on the student's interest of participation. Therefore, teaching methods should constantly renew, and spirit of sports should be put into physical education curriculum so as to enhance purposiveness and of physical education and make every student participates in it. From it, the students not only master the connotation and significance of sports spirit and also make their personality shown and improved so as to have a sound character.

4.2 teach the specific rules and norms of sports spirit positively.

It is a must to improve the operation available in practice, because sports spirit is a relatively abstract concept. Thus, the specific rules and norms of sports spirit are the key teaching, which enable students to know how to do in specific sports practice when they meet specific problems

4.3 enrich extracurricular sports activities and strengthen the construction of campus sports culture.

In addition to the sports teaching, the schools should also carry out various forms of sports training. Sports competitions can be for competition, fitness and entertainment. Through holding colorful sports activities and creating a thick atmosphere of campus sports culture, the sports spirit can be penetrated into the college students 'daily life.

4.4 select excellent teachers in physical education to go further into the daily activities of the school or students.

Based on the enthusiasm and team awareness towards sport from modern students, sports spirit is really put into student's daily life, which help students develop the habit of sporting, and let sports gradually become a necessary part of students' life.

4.5 to construct a comprehensive and incentive evaluation form.

Traditional teaching evaluation form roots in the examination. Different performance of different students is judged by single or same standard. However, simple evaluation standards ignore the students' individual experience, their comprehension and expression, which is not beneficial to the development of sports humanities. Under the background of modern humanism, PE teaching evaluation should not a means of distinguishing the pros and cons, but really make the diagnosis, control and supervision of evaluation function well. Also, more attention should be paid to such factors as student's emotion, values, and attitude. What's more, evaluation contents should be wide; it should be emphasized to evaluate comprehensively students 'abilities in such aspects as practice ability and social ability. As independent individuals, different students have different interests, physical qualities, athletic talents and. Therefore, in the course of physical education teaching evaluation, the differences among students must be fully taken into account. Teachers should employ encouragement to inspire students and evaluate them. Believe that every student will succeed and every student has their own strengths. Even if some students are not excellent in short time, their future development potential should be predicted. Evaluate students with encouraging them to participate in sports activities to enable them to live in the encouragement and develop their humanistic quality under teachers' the recognition and appreciation to achieve success.

## 5 CONCLUSIONS

Nowadays, some people's social life is being misled by material interests and money, people is lacking in humanistic spirit in thinking and action to some degree. Only by paying attention to the educational concept of innovation and combining the sports spirit and science spirit can the students' humanistic quality be gradually improved, so doe's humane accomplishment. It is very necessary to integrate humanistic spirit into school physical education in order to improve the students' self-cultivation and quality. It needs a potential and long-term process to shape human spirit, so does the gradual development of humane cultivation of students. The organization form of physical education teaching is flexible, the degree of transparency is relatively high, and physical education is a widely-developed education. Such teaching form helps the teachers and students to communicate each other. Teachers should not only do a good job in professional development, but also improve their comprehensive qualities, especially the humanities. Physical education teachers should teach professional knowledge; meanwhile, they have to bear the burden of cultivating the students. Comprehensive use of heuristic teaching, situational teaching, mutual aid teaching, exploratory teaching and other teaching methods should be attempted in order to fully arouse the students' learning autonomy and enthusiasm, who are the center of teaching. In the teaching of college physical education, modern advanced technology should be used fully, which provides convenient conditions for Reeducation. Some media equipments like computers and video cameras can be used to make teaching process more vivid, concrete and visual to stimulate students' interest in learning and provides a new way for the cultivation of humanistic spirit.

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# Based on the Reform and Development of Chinese Football Positioning and Overall Scheme Of Football Reform Development Thinking

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Abstract: in March 2015, the central committee of the communist party of China under the state council issued the "Chinese football development overall reform plan", become the focus of public opinion. "Solution" in many ways, this paper expounds the reform scheme of Chinese football, whether it is a principle, target and development way, talents training and social popularity is a new, not only have great role in football program, from the perspective of the reform and development of other projects. Football reform has many merit, set a benchmark for the reform of sports, but also on other projects to the reform and development has played a very important exemplary and leading role. Based on the content of the "plan", this paper analyzes the reform of football, also combined with the actual situation of football project and other projects of the actual problem is pointed out that the overall scheme of reform of Chinese football development demonstration and on other projects.

Keywords: football reform; Football culture; Education management

## 1 INTRODUCTION

In recent years, the development of Chinese football is not very desirable, the field result from bad to worse, the outside world to the criticism of Chinese football is higher and higher, since 2002, after washed into the World Cup finals, the Chinese football scores fell gradually, women's football from the world's top teams, women's dominant Asia also gradually decline, then, the Chinese football association conducted a series of reform, however, did not have the effect of the reform, the football association to lead a change to change, there is no improve the overall level. Hire a handsome or ordinary Chinese football coach, indigenous coach didn't reach the expected effect, but results from bad to worse, national team has been disappointing, for China is to the fans have given up the Chinese football. In March 2015, however, the central committee of the communist party of China under the state council issued "China's football development and reform the overall plan make the most of the fans. The plan a total of 11 items, and 50 events content, covers the reform goal, the reform direction of Chinese football, football system, football management aspects of content, since then, China's football in the reform and opening up in the spring. Also become the best football career development opportunities [1-3].

Xi general secretary has repeatedly in the instructions to make up my mind to make our country football career make up important occasions, prime minister li keqiang also attaches great importance to the soccer sports industry work, etc. Pointed out in the reform, the disadvantages of football development in our country mainly has insufficient understanding of football sports, leadership get rich quick, competition chaos and confusion of culture industry, etc. Football against gambling anti-corruption since 2009, the Chinese football development, progress, but with the development of the cause of world football and the progress of Asian football scores compared to China's football performance is still not ideal [3-5]. The football event project development reform is not a "patchwork" small, but new profound changes. The first army to football reform or sports reform, for other sports reform played an extremely important demonstration leading role.

## 2 MAIN BODY PRINCIPLE OF REFORM

From soccer practice in our country, the learning experience of football developed countries for reference, out of a new way to football reform and development with Chinese characteristics, fully realize the social value of soccer and function. Long-term combined with a solid foundation. Strengthen the top-level design, pay attention to strategy implementation; strengthen the football development of population, infrastructure, management foundation, cultural foundation, continue hard, for a long time for work. Emancipating the mind, change ideas, optimize the elements combination, innovation and development platform; Rules of respect, deal with the current and long-term, key and general, scale and benefit relations, strengthen scientific management, crack development problems. The system combined with the market mechanism. Giving full play to the advantages of the socialist system, integrating resources, forming resultant force; fully give play to the role of market mechanism, stimulate the vitality, create a fair environment, and encourage protecting fair competition. Development of football sports combined with promoting the national fitness. The popularization and enhance, the football and competitive football promote each other, promote football coordinated development and comprehensive progress, promote the national fitness; improve the people's physical fitness.

The practical reform principles, reform on other projects to have very important significance, based on the national conditions and learn from international experience, the combination of national football team before hiring foreign teachers a lot of reasons is not based on national conditions, although can please to foreign coach, but the coach of the Chinese players are not familiar with, it will cause "1 + 1 < 2" and other projects, to meet China's reality, at the same time, also cannot indulge in his own circle, sights in the long run. Volleyball project, for example the women's volleyball coach Lang ping, familiar with Chinese players, as well as rich foreign coaching experience, continuous development to drive the Chinese women's volleyball team.

## 3 DEVELOPMENT GOALS

To put in the long run, the purpose of development not only limited to at that time the gain and loss, however, more attention should be paid to the foundation, no foundation, is all talk. Bad a lot of sports development in China, and mainly reflected in the project less population, the target is not in the long run, foundation is not solid foundation of this a few aspects, the 2009-2014 period, the Chinese women's volleyball team scores fall, their main reason is that women's population is too little, even if all the people in China to play the best remain in the national team strength. But as in recent years, lang ping guide to enable newcomer, volleyball population increase gradually, also have improved significantly. Chinese basketball population, but the lack of good training system, mostly amateur basketball, without systematic training, the foundation is not solid, unable to his nation, in addition, the Chinese men's basketball is a lack of long-term adherence to goals. Sports, therefore, should pay attention to the development of sports population, pay attention to the foundation, clear long-term goals.

Development is not going to achieve the goal, need long-term accumulation, in the attention based on the premise of insisting on pay attention to the problem. From the point of basketball, to the development of Chinese basketball, to strong teams of the world, to create a new development pattern, cultivating new talents, but it doesn't mean existing athletes give up, should pay attention to improve the existing problems, exercise the existing team, at the same time with new people, new model development prompted both coordinated development, gradually improve sports. In addition, the development of sports is not only exists in the competitive level, more important is to promote the sport's influence, which is the movement of the wide degree, development of sports should pay attention to developing the project the influence of the masses and the mass sports and competitive sports together for common development.

Document the development of football into the economic and social development plan, implement "three steps" strategy. 1, short-term goal: improve the environment and atmosphere of football development; straighten out the management system of football, football, medium and long-term development planning innovation football management pattern with Chinese characteristics, and the formation of football and soccer industry coordinated development pattern. 2, medium-term goal: juvenile football population increased dramatically, first-class professional league organization and competition level has reached Asia, among Asian countries football, women's return to the ranks of the world's top teams. 3, long-term goal: to realize all-round development of Chinese football, football become common public participation in sports, the whole society to form a football culture of health; Professional football league organization and the level of competition to enter the world advanced level; Positive bid to host the FIFA World Cup soccer; National soccer significantly enhance the international competitiveness, into the world's elite.

Three-step strategy put forward showing the vision of government reform and nuanced, the government set up the long-term goal, determined to China's football development to become the world's top teams, the reform of the specified target is not an unrealistic goal, but by the accumulation of short-term and medium-term target for, to determine the short-term goal is to improve the football development of environment and atmosphere, establish correct football management system. Through short-term goals set, clearly pointed out that the next task, make long-term plan into several relatively simple is easy to implement tasks, many a fickle makes a muscle. Medium-term goal setting is not only a test of the development of football results, but also the important stage of the second half of the football development planning. At the same time, the medium-term goal to increase the number of juvenile football population also determines the future of football development potential. The planning for other project also has important guiding significance to the reform, the development of other projects and reform can also follow the three-step strategy, determine the long-term development goals, development has a long-term plan for the project, at the same time, also want to long-term goal pieces, from small start step, in addition, set the medium-term planning, examination of the development of the situation, but also conducive to the further development later.

First of all, the Chinese football association to clear positioning and functions, the football association to contact responsible for unity of the nation's football forces, promoting football, cultivate talent, develop industry standards, the development of the professional league system, construction management national soccer team. In addition to adjust the Chinese football association, the China football association separated from the general administration of sport, the internal organization, work plan, finance, personnel management, international exchanges and pay autonomy. In addition, the Chinese football association will no longer set administrative levels, no longer belong to the government departments, but into a social group. Is composed of many united, balance the interests of all parties. The Chinese football association in the construction of the restructuring process, to adjust and improve the internal structure and strengthen own construction, talents, absorbing various talents to join the football association, strengthening industry self-discipline, strive to solve the problems existing in the football field; Enhance service awareness, to overcome the security administration tendency. China football association in accordance with the mechanism of corporation operation, implement the financial disclosure, accept the audit and supervision. The football association to set up graded management system, the Chinese football association set the place under the football management association, the local football affairs management. Chinese football association, separated from the general administration of sports is a unprecedented event, this not only means that the general administration of sports and decentralization, more important is the development of football will no longer be bound, free development, not bound by the provisions of constitution and, at the same time there will be no performance requirements, you can plan for long-term, seek long-term development.

The direction of reform of demonstration effect on other projects to make unprecedented, other project in-depth reform can also tube separated measures, seek change, rapid development, such as basketball and volleyball, basketball and football has a lot to the development of the similarities, the Chinese basketball association also belongs to the state general administration of sports, and basketball management center is a group of two brands, the development of basketball movement is restricted by the state sports system, players to represent the province to participate in the national games competition, make the players can't even get good training in the offseason, but can't refuse. Administrative tend to be serious, unable to talents, absorbing various talents, therefore, the reform of the Chinese football association in China most of the sports project has an important demonstration and promoting role.

## 4 CONCLUSION

Football reform will bring new benefits cognitive restructuring and value. From the point of the strategy of high-level, football as a breakthrough for the development of China's new sports system reform, promote the campus football is also the important fulcrum of the reform of school physical education. From the point of market economy, the development of Chinese football professionalism to face China complementary system and market-oriented, strive to achieve a win-win situation, let the market promote the commercial development of football. In law, the Chinese football association has proposed to establish a new supervisory mechanism, and put forward to strengthen the management of the players, coaches, referees, officials, fundamentally prevent corruption and match-fixing. From the cultural point of view, the country needs to a football culture movement to revolutionize the social ethos and with the world's first movement to create a new national character. Therefore, the development of football sports can bring new social effect from many aspects, from the national emphasis on career development; soccer reform enterprise will become the pioneer of the Chinese sports system reform and the successful model.

## 5 ACKNOWLEDGMENT

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# Research for the Sustainable Development of Colleges and Universities Aerobics

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Abstract: Factors for the development of colleges and universities aerobics "school university student satisfaction with the development of the aerobics in colleges and universities", "the number of calisthenics athletes training", "aerobics athlete training every time the length of time", "aerobics athletes age", "aerobics coaches age", "aerobics coach education" is analyzed, it is concluded that the development of colleges and universities aerobics mainly depends on gymnastics coaches and athletes themselves of these two factors, only the two coordinate each other, to make the Chinese enterprise have a better development.

Key words: physiological indicator; competitive sports

## 1 INTRODUCTION

In competitive sports games, aerobics is introduced to China in 80s of 20th century, due to aerobics motions are elegant and artistic, is well received by national people, it has been rapidly developed and gradually popularized in Chinese universities campuses. By far, aerobics has already become an important part in Chinese some universities campus cultures. In recent years, with competitive sports development and university sports constantly infusion, let Chinese some universities competitive aerobics to arrive at international advanced level, many universities delegations performances are outstanding, they have achieved excellent results in many international big sports events [1-3].

These proud performances achievement is from Chinese universities competitive sports development and university students' constant efforts, it reserves lots of excellent reserve talents for Chinese competitive aerobics team, with respect to this, and we summarize Chinese universities competitive sports stage development objective [4-6]. Along with Chinese competitive sports system reformation constantly development and deepening, competitive sports and universities aerobics team organic combine that lets China's implementation of national fitness, national sports to be well carried on. With respect to this, we carry on factor analysis of Chinese universities aerobics status.

## 2 EVALUATION MODEL ESTABLISHMENTS

Main way of factor analysis is reducing dimension of variables, which is recombining original many variables with correlation into a group of uncorrelated variables to replace original variables and use as one factor. Therefore, we can pay attention to every time observation's variables that have maximum variation, to every time observation's small changed variables that can be used as constant to process and get rid of them, so that it reduces variables number in problem that needs to be considered.

### 2.1 Correlation indicator each factor analysis

Here, we discuss from 40 universities aerobics universities students satisfaction, coaches' age structure, athletes techniques grades, athletes ages, fields' facilities status, school funding for aerobics, coaches' education background and titles, athletes sports training years, training results testing factors, training motivations, training times and temporal distribution.

Correspond to above analysis, we can get conclusion as following : On a whole, present Chinese universities students are mostly satisfied with universities aerobics team that occupy 37.21%( Great satisfaction)of totality、34.88%( More satisfactory)of totality. For universities aerobics coaches' age structure, it makes analysis. Statistical result is as Tab.1.

Table 1. Universities competitive aerobics sports team coaches' age distribution

| Age structure | Number of people | Proportion |
|---|---|---|
| 21-30 | 7 | 31.82% |
| 31-35 | 11 | 50% |
| 36-45 | 3 | 13.64% |
| 46-55 | 1 | 4.54% |
| Above 56 years old | 0 | 0.00% |

From above analysis, it is clear that universities aerobics coaches' age distribution are mostly in 31 to 35 years old that occupy half of totality, while no old coaches that are above 56 years old.

By above analysis, we can see that universities aerobics athletes training duration concentrates in three to four times a week, and every time training duration concentrates on every one to two hours that respectively occupy 44.00% and 56.80% of totality. From above analysis, it is clear that aerobics players' age distribution concentrates on 22 years old that occupy 36.8% of totality. By above analysis, it is clear that aerobics coaches education background is mostly master that occupies 72.27% of totality, and aerobics coaches' titles are mostly lectures that occupy 72.27% of totality.

## 2.2 Result analysis

By above each factor statistical analysis, and then carry on analysis of universities students in school satisfaction on universities aerobics development, aerobics athletes training times, aerobics event duration per one time training, aerobics athletes' age, aerobics coaches age, coaches' education background, and get their " factor screed plot" as Fig.1.

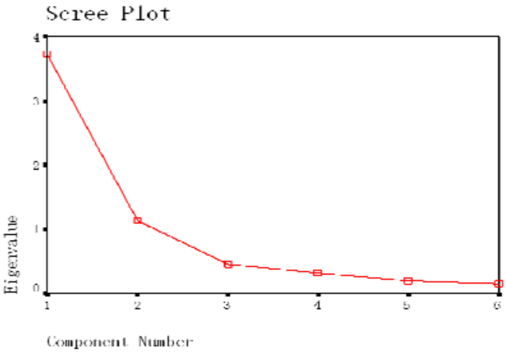

Figure 1. Factor of gravel figure

By above factor analysis, it can get that 'universities students in school satisfaction on universities aerobics development', 'aerobics athletes training times', 'aerobics event duration per one time training', 'aerobics athletes' age', 'aerobics coaches age', 'coaches' education background'; these factors can be summarized into two main factors (because there are two larger slope changes in screed plot), one factor is from aerobics coaches, the other is from aerobics athletes own factor.

## 3. CONCLUSION

Chinese universities competitive sports development has gone through some setbacks, here summarize In Chinese universities, aerobics takes advantages of national policies reformation and self charm to get well development in Chinese universities. The paper carries on factor analysis of Chinese universities aerobics team development influence factors and gets aerobics development mainly relies on aerobics coaches and aerobics athletes themselves two factors. Only do well in mutual adjusting of the two then can move Chinese aerobics to next level.

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# A Study on Marx's Inheritance and Development for Hegel's Thinking Way

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Abstract: the way of thinking is the soul of philosophy. In the life history of actively participating in revolutionary practice with the question about age. Based on the inheriting and critique of Hegel's way of thinking, Marx gradually identified a theory called "new materialism". This theory embodied the inheritance and development of Hegel's philosophy thinking way in the following four aspects: first, on the whole theory, Marx developed Hegel's idealistic dialectics into materialistic dialectics; in the field of social history, Marx developed Hegel's the idea that the general form of consciousness inputs history into the idea that social existence determines social consciousness; in terms of epistemology, Marx developed Hegel's the thinking way from understanding to practicing into thinking route from practice to understanding ; in the study method, Marx developed Hegel's study method which is from the abstract to the concrete into the method from the concrete to the abstract.

Key words: way of thinking; Marx; Hegel; develop-discard

## 1. INTRODUCTION

Philosophy is theoretical and systematic world outlook and methodology, which is a social consciousness that people reflect the world, their recognition about the existence of human being and the relationship between them. The task of philosophy is on analyzing and summarizing the achievement of human understanding on the basis of the human practice and scientific cognition, from which varieties of different world outlook and methodology are summarized. Also, the worldviews and methodologies are critically anal sized and expounded so as to form the worldviews and methodologies that can scientifically guide people to understand and change the world, to provide sharp ideological weapon for people. Therefore, fundamentally speaking, philosophy only explores the problems about how to understand the world transform, which belong to fundamental world outlook and methodology. Each philosopher builds their own theoretical system building in the process of learning, inheriting and criticizing the thinking way of the former scholars.

## 2. INHERITANCE AND DEVELOPMENT OF MARX SYSTEM

In the course of inheritance and development of Hegel's abstract and speculative idealistic thought and study methods, Marx founded the methodical and scientific theory of the Marxism based on the scientific concept of the practice and theory of social production and on the materialist conception of history and the theory of surplus value as the core for the purpose of liberating the proletariat and mankind. The great change in the history of thought embodied in the following four aspects.

First, in terms of theory as a whole, Marx developed Hegel's idealistic dialectics into scientific materialist dialectics:

Dialectics, as Marx mentioned in Capital,1872 , Second Edition postscript": Dialectics became mysterious by Hegelian, but this didn't prevent him from becoming the first one to describe consciously the general moving form of dialectics comprehensively . Because the dialectical law for positive understanding of the existing things certainly also contains their negative understanding, which means inevitable disappearance. Dialectics for every form is from the constant movement, and also is understood from his temporary aspect. Dialectics does not worship anything, according to whose nature, it is critical and revolutionary "[1]. Everything in the real life world, including people's thinking and ideology, is that they are produced and developed under certain conditions but is eventually replaced by new things. But Hegel's dialectics is deduced by "relationship" and "contradiction" category from the logic category "absolute idea" or "absolute spirit" and "absolute rationality". His dialectics on "reality" category, the "relationship" category and "contradiction" category is full of mystical subjective logic speculation and confusion, and is often confused with the concept---- daily existing consciousness. He believes the only rationality, which is necessary, is realistic ", but actually, all the existence is not rational and realistic. For example, he personally thought Prussian autocracy was the existing social system that was rational, which is absolutely realistic and necessary. His so-called "rationality" concept conforms to the historical inevitability as well as the "absolute spirit" " and absolute rationality", which idealistic rational sophistry actually choke and killed dialectic thoughts against the "existing" anything into absolutely sacred, revolutionary ones. However, dialectical law shows that all the existing will be .extinct.

Marx took off the mysterious coat of the philosophy of Hegel, excluded its logic confusion and inherent contradictions, saved his dialectical thought in his philosophy and formed their own thinking way of revolutionary and materialistic dialectics. Based on this idea, all things are just temporary without any final, absolute, sacred things. Everything is just continuously formed and destroyed, whose process has its absolute meaning. The alternative history state of human society is just a temporary stage where human society develops from low levels to advanced ones. Among the stage, each stage is necessary, which is relative to its age and current conditions and has the reason of its existence. However, as for the new, higher gradually developed ones from its own internal conditions, it will gradually become obsolete, not have the necessity, not rational and eventually be perished. So it is with people's thinking and understanding, people's cognition and science develop gradually in the course from the low to the high. All the truth has its relative meaning, so there is unchangeable and absolutely- eternal truth. History, like the recognition, never end in a perfect state of human .The perfect society and country only exist in imagination. This dialectical philosophy overthrew all ideas about the ultimate absolute truth and its corresponding absolute concept on human condition. In front of it, there are no any final, absolute and sacred matters. Nothing can exist except for the continuous process of living and disappearing as well as endless rising process. This timelessly developing and revolutionary nature and its corresponding thought is the only to be recognized absolutely by dialectics. "In this way, the concept of dialectics itself turned into a conscious reflection that is dialectical and moving in the real world, thus Hegel's dialectics is reversed, that is , not the head but the foot going down to ground " [2].

Secondly, in the field of social history: from Hegel's the general consciousness form inputting history to social existence determines social consciousness:

Dialectics stop because of the philosophical system built. Therefore, Hegel holds the thinking way of abstract idealist in answering the question about the identity of thinking and existence, and it is applied in the historical view as one part of its systems too. He input the general consciousness into the history based on the abstract "absolute idea": history is unconscious but inevitable to work hard in order to achieve certain predetermined ideal goal, for example, Hegel worked hard to realize his absolute idea and strived to achieve the firm intention of the absolute idea, which built internal relation in historical event. In this way, people replace realistic and unknown links with a new mysterious providence that is not conscious or gradually conscious [3]. For example, his view of ancient Greek history and speculative method can prove the necessity of nobility well. So history is always adapted in accordance with certain scale outside it; real life and production is described as a non-history, while history is described as certain object out of daily life , which is outside world and beyond the world. Thus, the relationship between man and nature has been removed from the history, causing the opposition between nature and history. Therefore, according to this view of history see political and historical events can be seen in history, and it can also be seen that religion and the general theory struggle. Furthermore, as a historical time is described, it had to agree with the fantasy in its age.[2]. On the contrary, Marx, based on the materialist dialectics, studied people's social consciousness from the existence of human's "reality". This view of history illustrates realistic production process beginning from the direct material production of life and regards the form of communication produced and associated with its product way as entire history base, namely, civil society of different class is understood as the basis for the whole history. The civil society is described as the activities of the nation. From the view of civil society various theoretical result and form is clarified such as religion, philosophy, morality and so on, and their produce process is traced… This view shows that history doesn't end with ego consciousness in which the spirit produced in its spirit dissolve, but is the material result which happens in every stage of history and the sum of some aggregate productivity. Man, nature and individuals formed a relationship historically, which would meet a lot of productivity, fund and environment from former generations to later generations. This productivity, money and the environment change for new generations, but on the other hand, they also predetermined living conditions of new generation, making it develop and have its special properties. This view shows that people create environment, in turn, environment create people. Every individual and every generation meet ready-made things----- sum of productivity, fund and way of social communication, which is the realistic basis of the 'real' and 'human nature' imagined by philosophers and the realistic foundation of the objects that they deified and struggled with. Despite the foundation the resistance from the philosophers who appear as' ego-consciousness' and 'single person' identity, its effect and influence on the development of the people did not suffer interference "[2].

Thirdly, in Epistemology, Marx avoided the partiality of Hegel's theory from cognition to practical thinking route, and develops into a thinking route from practice to cognition:

We know that in the history of philosophy there are two ways of cognition towards things, the reality and the perception as follows: one is the cognition towards the old materialism that understood from the object or intuitive view; the other is about the understanding for idealism, which is contrary to materialism, but promote the development of initiative in the abstract way, namely, the world is recognized in terms of the main body or abstract concept. Both of these two approaches are partial, and cut off the relationship between knowledge and practice, subjectivity and objectivity. The correct way to cognition is the practical materialism thinking way put forward by Marx and used in his work. That is to say, only from practice can people provide a reasonable understanding for things, reality and perception. Ignoring the practice, people cannot obtain those perception through abstract thinking as well as people's perceptual knowledge, perceptive understanding of these experience can go up to the understanding of the highly-abstract rational cognition so that reasonable theory cognition and conclusion can be obtained. Whether people's thinking is correct and has the practical reality as well as the power to actively guide the practice must be tested by practice. Thus, The cognition, practice, subject and object can be combined to form a complete and unified understanding process for practice, which can correctly reflect the understanding of things and the world in our real life.

The philosophy of Hegel goes around the absolute idea for dialectical movement. The absolute concept externalizes itself into outside nature, then, it goes back to itself in spirit, thinking and in history. That is to say, he understands the thinking, the nature and the human society beginning with the abstract concept "absolute idea". Naturally, his cognitive way goes from recognition to practice. As Marx citied that if the dominated thought is separated from the rulers, mainly from the various relationships with the mode of production at a certain stage, it can be concluded that thought always occupies the dominant position in history .in this way, it is easy to abstract common ideas and concepts from these different ideas and regard them as leading ones in history. So, all of these individual ideas and concepts can be considered as self-regulation from a general concept for the development of the history. In this case, it is very natural that all the relationships among people can be educed from the concept of human, the imaginative people, human’s nature and the average person.. This is the philosophy of speculation. In the ending of the book *the Philosophy of History*, Hegel himself admits that what he inspects is only the general concept for forward movement. he describes “real theodicy” in history . Now, it can go back to the concept producer, to theorists, to metaphysician and philosopher. It can be concluded that philosophers and thinking men play leading roles in history since ancient times, as we can know, which was stated by Hegel [3].

Marx understand the human world from a practical point of view, "what we consider is those who are engaged in practical activities and we can also reveal the development of life in the ideological reflection and echo. Therefore, morality, religion, metaphysics and other ideology as well as its consciousness will lose the outlook of independence. They have no history and its development. Those who develop their own material production and material exchange change their own reality while changing their own thinking and the product of thinking. It is not consciousness that determines life, instead, life determines consciousness. The former method of observation is based on consciousness, which is considered as a person in life. the second method in line with the actual life is based on the reality and the individual itself in life, in which consciousness is only regarded as their own one. [3]" Therefore, horse, favor in the production of a study on ideology is from "people can" make history ', we must to life "the existing" all the history of the first premise "starting in the examination of the initial history the relationship between the four factors and four aspects, we found that: people have consciousness. But the person is not the beginning is' pure 'consciousness. 'spirit' is very unlucky from the very beginning, subject to the "entanglement" of the material, which is manifested by the vibration of the air layer, sound, in short, that language. Language and consciousness have the same long history; the language is a kind of practice, which exists for others as well as for me. Language, like consciousness, is only due to the need to do so, as a result of the need to interact with other people. Where there is a relationship, the relationship exists for me. Therefore, in the beginning, consciousness is the product of society, and, it remains the product as long as human still exist [8]. Marx not only understood them in the object or visual form, but also understood them on the condition that the initiative of the subject is played and they are treated as real and perceptual activity itself as well as practice. Compared with two former modes, the conclusion drawn from this way of thinking is closer to the nature of the things, which does not mean the end of this way, instead, the second step must be taken---- thinking should prove its own truth in practice, namely, based on the accept of verification, the cognition works again. In such a cycled way, human will become know more the truth and apply it for human beings and benefiting the world.

Fourthly, in the research method, Marx developed Hegel’s research method from the abstract to the concrete into the one from the concrete to the abstract Through the investigation of Hegel's works, we find that the system is built on the basis of the research method from the abstract to the concrete. But it starts from many specific forms of consciousness and builds unprecedented system with the beginning of logic, natural philosophy as the intermediate links, and the ending of the philosophy of spirit --- the dialectical movement of "absolute idea". As Marx pointed out, Hegel ignored the following : first , people must be able to live in order to make history , that is, where real human exists, Ideology produce including "creating the history"---- consciousness can only be aware of the existence at all times, and the presence of people is their real life process" [9].

Secondly, even many concrete forms of consciousness such as morals, ethics, art and religion are obtained through abstraction towards thing, reality and perception from the practice. The "concrete form" is still an abstract concept or a theory rather than a concrete one in reality in terms of the revolutionary, practical and critical activity" ". Hegel starts with pure thinking, using the method "from nothing, through nothing, at nothing" , the method from abstract to abstract , to carry out the study of philosophy. What differs from it is that Marx begins with the most tenacious fact --" individuals in reality ", using the method "practice, through understanding, practice again", the method which is from the concrete to the abstract and back to the concrete again, to explain the world and transform it. In a case of population, it seems proper that it starts with the population as social behavior and the main basis in economics. However, by a more careful investigation it proves wrong. Regardless of the class of the population structure, the population is an abstract. If you do not know these factors such as labor, capital and so on where the class is based, it is nothing. Therefore, if beginning with the population, then this is about a overall chaotic image and through more proximate rules, you will achieve more simple concept in the analysis; from the specific of image to more and more thin abstraction, and will finally achieve some simple rules. Thus, the trip return back till to return to population, however, in this time the population is no longer a chaotic image on the whole but a rich overall with many provisions and the relationship. Compared with Hegel' idea "the complete image turns into abstract regulations ", Marx proceeds from the reality such as class, capital and population closely related to population, and go through the reproduction of the specific by abstract regulations in the course of thinking. Here, the concrete overall as the general idea and concrete thought is actually the product of thinking; however, in no way it was the product of the concept outside intuitive and image or beyond the thinking with self-producing but the product of the process during which intuitive and image is processed into the concept ... The subject keeps independence outside the mind as long as the mind merely remains moving in a speculative and theoretical way. Therefore, the main body, namely, the society must appear in front of image as the premise all the time in theoretical way [4]".

## 3 conclusions

Marx and Engel's criticize Hegel's work and the whole philosophy field as the beginning is in the process of inheritance, critique and develop-discard Hegel's philosophy and its research methods. They also reformed Hegel's philosophy thought and research methods in four aspects by way of criticism , develop-discard towards Hegel system on " the great man in European classical philosophy " and of checking the whole European classical philosophy. Proceeding from practice, the philosophical methodology Specific- Abstract- Specific is established. They successfully applied this methodology to make a scientific explanation for the problem "reality" so as to make great reform for the philosophical history and human history.

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# Based on the Method of AHP in the Earthquake and Rescue Command Research

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Abstract: Due to the complex geological structure, the earthquake occurred frequently in our country, and the strong earthquake has caused our country to become one of the most serious disaster stricken countries. Scientific and effective rescue plan and search and rescue command work is of great significance to earthquake rescue scene. In this paper, the mathematical model of analytic hierarchy process is established, and the decision layer is set up, and the qualitative problem is quantified. The safety assessment of earthquake emergency response and rescue in earthquake scene are discussed respectively. Then began to study the ruins of the rescue and search and the deployment of search and rescue forces, and finally can be optimized search and rescue earthquake scene of the target and a full range of search and rescue operations decision-making system optimization and design. Based on quantitative methods of the first rescue scheme when the earthquake occurred, when the earthquake we can more effective and scientific deployment of relief supplies and manpower, for earthquake relief to provide practical guidance significance.

Key words: *APH* , Priority decision, Scene rescue

## 1. INTRODUCTION

Earthquakes are likely to erupt at any time, and trigger a series of disastrous reactions. It is one of the major natural disasters, and this kind of movement will occur frequently, which is not controlled by any human being. With the rapid economic and social development, urban population, property intensive, the earthquake will cause a large number of casualties, property losses, but also to bring a lot of negative impact on society [1-4].

The territory of our country is vast in area, and more than half of the cities are located in earthquake prone zone, earthquake happened quite frequently, the distribution of urban population and buildings and too dense, so when the earthquake comes, it will cause enormous damage and trigger a series of chain reaction, resulting in the loss is immeasurable. According to past experience, although we human beings can not prevent earthquakes occur, but if we have more in-depth understanding of the earthquake, when the earthquake occurred we have more outstanding performance, also can reduce the loss caused by the earthquake in a certain extent [5 ,6].

## 2 DEFINITION OF REGIONAL EARTHQUAKE DISASTER AREA

Here the "region" is a large range, like a county or a city. In the actual earthquake relief process, will be divided into several parts throughout the disaster area as shown in fig.1. A local or a regional, rescue their priorities are with certain method by computing the final, we have determined the sequence is divided into different levels, then the highest is "a", also is the first to adopt a rescue.

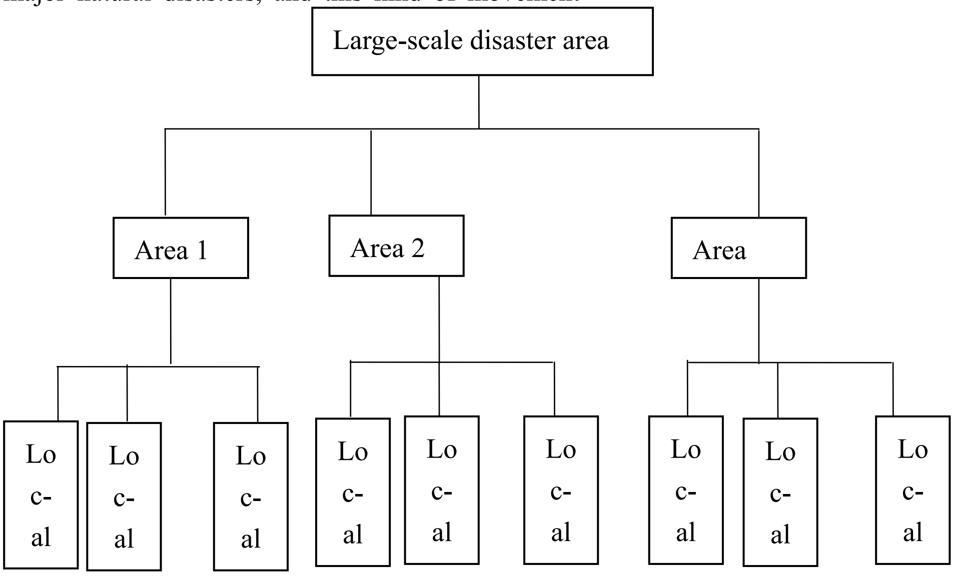

Fig.1 Zoning map of earthquake stricken areas

## 3 REGIONAL SEARCH AND RESCUE TARGET CLASSIFICATION

Obviously, the scope of regional rescue priority is the area devoted to the analysis of the search and rescue priorities of each area, you can find out the first rescue area.

### 3.1 Determination of influencing factors

There are many factors that affect the rescue area, combined with Chong Gang Miao and other experts point of view that depends on the two problems: one is buried personnel number, the second is the difficulty of the rescue, the difficulty of the rescue and the influence of weather, terrain and traffic.

1) The number of buried

Trapped persons is not only related to the extent of the damage caused by the earthquake, but also to determine seismic field trapped, waiting for rescue personnel and rescue force distribution in the process of the key factors, so as to be the important factors influencing earthquake on-site search and rescue.

2) Weather

When the weather is very bad, the search and rescue operations will be relatively difficult. Therefore, in the same case, the weather conditions are good places to start the search and rescue operations, the weather situation is worse, the local search and rescue.

3) Terrain

The topography of the disaster area is related to the rescue team can quickly reach the disaster area, it is also related to the rescue team in what way, and different terrain will produce secondary disasters and other issues. When the disaster of the terrain conditions are relatively good, our search and rescue is relatively easy; when the relatively poor terrain conditions in the disaster areas, such as mountain deep, then our search and rescue operations is more difficult. Therefore, in order to improve the efficiency of search and rescue, our principle is that the first easy, in the case of the same terrain, the first relief, and then in the rescue of complex terrain.

4) Traffic

Another important factor affecting the search and rescue operations in disaster areas is the traffic situation. When a region's traffic is blocked, the progress of the rescue will be delayed. Therefore, in the same situation, the road traffic situation is the first place to rescue, traffic conditions are blocked by the local rescue later.

### 3.2 Evaluation level

1）The model of mathematical establish

According to the study of the above factors, the following mathematical model is obtained:

$$W = P_d \times \sum\left(A \times Y_m\right)$$

In the formula, $W$ is expected to score in the search and rescue area, $P_d$ is the probably success of search and rescue, $Y_m$ is the rate of estimation for compression , $A$ is the total population of each intensity region.

2）Determination of model parameters

（1）Success probability of search and rescue $P_d$

Assuming that time conditions are fixed, the search and rescue operations team to start rescue work in the disaster area is $P_d$. So $P_d$ and the difficulty of the rescue of $d$ exist function, and 0<$P_d$<1, the two become inverse ratio relation, i.e., $d$ larger, $P_d$ smaller. Therefore, it is type $P_d = 1 - e^{-\frac{1}{d}}$ , expressed by expansions of the mathematical expression of the success of the rescue, where $d$ is on weather conditions, traffic conditions and terrain conditions weighted sum of the average value. In the factor scores, when the weather is thunderstorm weather, terrain for the high altitude terrain that traffic completely blocked the highest score, at this time the most difficult rescue. When the weather is good, the terrain flat and traffic situation is very smooth. At this time the difficulty of rescue minimum type and expressed as:

$$W = \left(1 - e^{-\frac{1}{d}}\right) \times \sum\left(A \times Y_m\right)$$

Tab.1 Impact of rescue difficulty assignment table

| terrain | traffic | weather |
|---|---|---|
| plain (1) | pass(1) | sun(1) |
| hill (2) | Half pass (2) | cloudy (2) |
| mountain (3) | block (3) | light to moderate rain (3) |
| plateau (4) | | heavy rain (4) |

Note: the value of the inside of the bracket is an assignment.

（2）Determine $Y_m$

The number of people trapped is composed of the number of casualties was not injured and trapped people. In the actual process of search and rescue, trapped without the injured almost entirely by local victims of the first time out, so that it is the rate of trapped casualties. According to the relationship between the earthquake casualty rate and the earthquake intensity given by the State Seismological Bureau, the death rate and the injury rate of the earthquake are roughly calculated as shown in table 2.

Tab.2 Relationship between death rate and earthquake level

| Intensity | City | | Township | | Rural | |
|---|---|---|---|---|---|---|
| | Mortality | Injury rate | Mortality | Injury rate | Mortality | Injury rate |
| VI | 0.14 | 5.4 | 0.2 | 3.6 | 0.06 | 0.38 |
| VII | 3.1 | 53 | 3.2 | 31 | 0.64 | 3.1 |
| VIII | 48 | 460 | 40 | 260 | 608 | 27 |
| IX | 680 | 4000 | 480 | 2200 | 74 | 210 |

After the earthquake can not be the first time to give the specific circumstances of the entire disaster area I is based on the relevant mathematical model derived from the relationship between the eastern region of China I:

$$\begin{cases} I_a = 5.019 + 1.446M - 4.1361g(\mathrm{R}+24) \\ \mathrm{I}_b = 2.240 + 1.446M - 3.0701g(R+9) \end{cases} \qquad \sigma = 0.517$$

The relationship between I in Western china:

$$\begin{cases} I_a = 5.253 + 1.398M - 4.1641g(\mathrm{R}+24) \\ \mathrm{I}_b = 2.019 + 1.398M - 2.9431g(R+8) \end{cases} \qquad \sigma = 0.632$$

Among, $I_a$: Long axis intensity, $I_b$: Short axis intensity, M: Earthquake grade, R: length, $\sigma$: standard deviation。Once given the specific circumstances of the disaster area, it is to be corrected immediately on the I, and then determine the priority of the rescue.

3.3 Search and rescue target classification

Normalization is the process by which the dimension is transformed into dimensionless. There are a lot of normalization methods, the method used here is as follows:

$$X'_i = \frac{X_i - X_{\min}}{X_{\max} - X_{\min}} \times 100 \qquad \mathrm{i} = 1,2,\cdots,\mathrm{n}$$

When $30 \le X'_i \le 100$, Rescue level for the first class;

When $10 \le X'_i \le 30$, Rescue level for the second class;

When $X'_i \le 10$, Rescue level for the third class。

## 4 ESTABLISHMENT AND CASE ANALYSIS OF TARGET CLASSIFICATION AND RESCUE MODEL

### 4.1 The disaster situation of counties in Wenchuan earthquake

In 2008 China's Wenchuan earthquake broke out, reached a magnitude of 8.0, this earthquake is not only high magnitude, spread the scope is very broad, many neighboring provinces have been the impact of the earthquake, and caused huge casualties, after four months, given the news, the earthquake caused a total of 69227 died, 374643 people were injured, missing 17923 people. Affected areas related to ABA, Mianyang, Deyang, Chengdu and other areas, the earthquake disaster area rescue priority conditions such as table 3 shows.

Tab.3 Key factors affecting sequence of rescue in Wenchuan earthquake

| County name | Owned by the city | Total population / million | Population density | Intensity | Estimated death toll | Estimated number of injured | terrain | traffic | weather |
|---|---|---|---|---|---|---|---|---|---|
| Wenchuan | ABA | 10.40 | 10.5 | 8～11 | 19718 | 47902 | Plateau | Block | Sunny |
| Beichuan | Mianyang | 15.40 | 56.0 | 8～11 | 12012 | 35882 | mountain | Block | Sunny |
| Shifang | deyang | 43.30 | 499.0 | 8～9 | 9569 | 51614 | mountain | Block | Sunny |
| Pingwu | Mianyang | 18.60 | 31.0 | 7～11 | 6417 | 13504 | mountain | Block | Sunny |
| Qingchuan | Guangyuan | 24.60 | 76.0 | 8～9 | 5437 | 29323 | mountain | Block | Sunny |
| Maoxian | ABA | 10.90 | 27.0 | 7～10 | 3854 | 15715 | plateau | Block | Sunny |
| Jiangyou | Mianyang | 88.30 | 323.0 | 8 | 2790 | 21987 | plateau | Block | Sunny |
| Yanting | Mianyang | 60.90 | 370.5 | 7 | 195 | 1888 | mountain | Block | Sunny |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| lixian | ABA | 4.60 | 10.0 | 7～8 | 78 | 639 | mountain | Block | Sunny |
| heishui | ABA | 6.01 | 14.0 | 7 | 4 | 19 | plateau | Half pass | Sunny |
| jinchun | ABA | 7.20 | 14.2 | 6 | 1 | 3 | plateau | Half pass | Sunny |
| songpan | ABA | 7.30 | 8.0 | 6～8 | 18 | 74 | plateau | Half pass | Sunny |
| jiuzhai | ABA | 6.50 | 12.5 | 6 | 1 | 2 | plateau | Block | Sunny |
| xiaojin | ABA | 8.00 | 14.0 | 7 | 5 | 25 | plateau | Half pass | Sunny |
| hongyuan | ABA | 4.24 | 5.4 | 6 | 1 | 2 | plateau | pass | Sunny |

## 4.2 The establishment of mathematical model

According to the above factors, it can be concluded that the level of analysis of the indicators layer, as shown in figure 2.

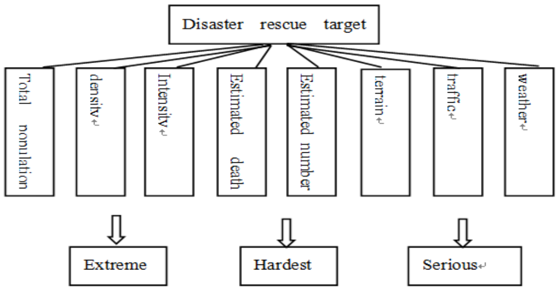

Fig.2 Process chart of level analysis of rescue target in disaster area

According to figure 3, the level structure of the disaster relief target is given, the second layer is based on the first layer, and the second layer is compared, so that the mathematical matrix is listed in the order. Below we take the A layer and the B layer as an example to give the matrix as shown in Table 9:

Tab.4Matrix relationship between top layer A and next layer B

| $A$ | $B_1$ | $B_2$ | … | $B_m$ |
|---|---|---|---|---|
| $B_1$ | $B_{11}$ | $B_{12}$ | … | $B_{1m}$ |
| $B_2$ | $B_1$ | $B_1$ | … | $B_{2m}$ |
| | | | | |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋮ |
| $B_m$ | $B_{m1}$ | $B_{m2}$ | … | $B_{mm}$ |

where $B_{ij}$ represents the proportional scale that among so many principles, which principle is relatively important to the object. Currently, the widely used is 1-9 scaling method, see the table 4.

Tab.4 9-1 scale method

| $B_{ij}$ assignment | Meaning | $B_{ij}$ assignment | Meaning |
|---|---|---|---|
| 1 | $i$ and $j$ has the same important | | |
| 3 | $i$ and $j$ are minor important | 1/3 | $i$ is not minor important than $j$ |
| 5 | $i$ and $j$ are obviously important | 1/5 | $i$ is not obviously important than $j$ |
| 7 | $i$ and $j$ are strongly important | 1/7 | $i$ is not strongly important than $j$ |

| | | | |
|---|---|---|---|
| 9 | $i$ and $j$ are extremely important | 1/9 | $i$ is not extremely important than $j$ |
| 2,4,6,8 | Among $\{1,3,5,7,9\}$ | 1/2,1/4,1/6,1/8 | Among $\{1,1/3,1/5,1/7,1/9\}$ |

In the real solution, because $B_{ij}$ is obtained by the makers and the professors according to their own knowledge and experiences, so it is possible has inconsistency in constructed maxim $B$. Therefore, it should test the consistency to the judgment matrix.

According to theory of matrices, when judgment matrix $b$ has totally quality of consistency, its biggest characteristic root equals the order number judgment matrix, that is $\lambda_{\max} = m$, The rest of the characteristic root is equal to zero . When judgment matrix $b$ does not has totally quality of consistency, $\lambda_{\max} \neq m$, then, taking the difference of maximum characteristic root $\lambda_{\max}$ and judgment matrix of order m, and make the ratio between the $m-1$ and the difference as the indicator to judge whether maxim has deviated from the consistency. That is, to use $CI = \frac{\lambda_{\max} - m}{m-1}$ to test the consistency of maxim B. when $\lambda_{\max} = m, CI = 0$, it represents it completely has the quality of consistency; if value $CI$ deviates from 0 far away , it shows that the consistency of judgment matrix is bad.

In order to measure different order of judgment matrix whether has the satisfied consistency or not, this paper introduces the consistency ratio $CR$, and the $CR = \frac{CI}{RI}$. The 1 to 10 RI value of the judgment matrix can be expressed as follows:

Tab.5 Value of RI of 1-10 order judgment matrix

| order | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| $RI$ | 0 | 0 | 0.58 | 0.9 | 1.12 | 1.24 | 1.32 | 1.41 | 1.45 | 1.49 |

Then, it gets the final judgment matrix:

$$B = \begin{bmatrix} 1 & 3 & 1 & 2 & 2 & 1/3 & 1 & 1 \\ 1/3 & 1 & 1 & 5 & 5 & 1/3 & 2 & 1 \\ 1 & 1 & 1 & 7 & 7 & 1/3 & 5 & 1 \\ 1/2 & 1/5 & 1/7 & 1 & 1/3 & 1/3 & 1/5 & 1/3 \\ 1/2 & 1/5 & 1/7 & 3 & 1 & 1/3 & 1/5 & 1/3 \\ 3 & 3 & 3 & 3 & 3 & 1 & 5 & 2 \\ 1 & 1/2 & 1/5 & 5 & 5 & 1/5 & 1 & 5 \\ 1 & 1 & 1 & 3 & 3 & 1/2 & 1/5 & 1 \end{bmatrix}$$

When $CR < 0.1$, it regards judgment matrix has satisfied quality of consistency. If $CR > 0.1$ , it needs to adjust the judgment and then make matrix satisfied quality of consistency.

Through consistency test, the paper obtains $CR = 0.08 < 0.1$. For The next step this paper adopts MATLAB to calculate the characteristic root of the judgment matrix and its correspondingly feature vector, the invoking format to be: $[V, D] = eig(B)$, in it, V represents the new maxim constituted by the feature vector of maxim B, D represents the new maxim constituted by the characteristic root of maxim B. In D, the characteristic root is the element of cater-corner, other elements to be 0. It can obtain the correspondingly element weight after the normalization of the biggest characteristic root of D which reflect in the feature vector of v.

Then it gets the final weight

$$w = [0.0531, 0.1522, 0.2421, 0.2535,$$
$$0.1624, 0.0982, 0.0862, 0.0523]$$

### 4.3 Fuzzy Comprehensive Evaluation

### 4.3.2 Establish Fuzzy Comprehensive Evaluation

(1) Confirming Evaluation Factor Level

Supposing the reflected main factors of evaluated objects to be $m$ , by using $u_1, u_2, \cdots, u_m$ to represent respectively, marking the formed evaluation elements collection as $U = \{u_1, u_2, \cdots, u_m\}$. For the every element in the formed evaluation elements collection $u_i (i = 1,2,\cdots,m)$, analyzing membership degree $r_{ij}$ of the evaluation degree $v_j (j = 1,2,\cdots,n)$, then gets the single element evaluated result of its number $i$ : $r_i = (r_{i1}, r_{i2}, \cdots r_{in})$. Normally $r_{ij} > 0$, and making $r_i$ to be normalized, although $\sum_{j=1}^{n} r_{ij} = 1$.

(2) Confirming Grade Set of Regulation

The planning level is divided into grade one, grade two and three grade three classes, namely the evaluation grade set V=[very serious disaster, disaster, disaster].

(3) Establishing Evaluation Maxim

For number $m$ factors, taking $r_i$ as the number $i$ line, constituting the dimming maxim $R$ which

| County name | Owned by the city | Actual casualty /people | Priority level | Disaster assessment results |
|---|---|---|---|---|
| Wenchuan | ABA | 50524 | First | Extremely disaster area |
| Beichuan | Mianyang | 42561 | First | Extremely disaster area |
| Shifang | deyang | 37914 | First | Extremely disaster area |
| Pingwu | Mianyang | 33691 | First | Extremely disaster area |
| Qingchuan | Guangyuan | 20148 | First | Extremely disaster area |
| Maoxian | ABA | 12116 | First | Extremely disaster area |
| Jiangyou | Mianyang | 9877 | First | Extremely disaster area |
| Yanting | Mianyang | 1946 | Second | Hardest hit |
| lixian | ABA | 1715 | Third | Serious disaster area |
| heishui | ABA | 90 | Third | Hardest hit |
| jinchun | ABA | 58 | Third | Affected areas |
| songpan | ABA | 42 | Third | Serious disaster area |
| jiuzhai | ABA | 41 | Third | Hardest hit |
| xiaojin | ABA | 40 | Third | Serious disaster area |
| hongyuan | ABA | 11 | Third | Affected areas |

combines number $m$ factors and number $n$ evaluation grade, as follows:

$$R=\begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1n} \\ r_{21} & r_{21} & \cdots & r_{11} \\ \vdots & \vdots & \cdots & \vdots \\ r_{m1} & r_{m1} & \cdots & r_{mn} \end{bmatrix}$$

(4) according to analytical hierarchy results , confirming the weight distribution $w_i$ of each indicator $u_i$ : $w_i=(w_{i1},w_{i2},\cdots,w_{ik})\ (i=1,2,\cdots,s)$ . For the weight $w_i$, it requires $w_i \geq 0$ and $\sum w_i = 1$ .

(5) Dimming Synthetic Formation

On the basis of confirming the dimming maxim $R$ and weight vector $W$, by using the weight vector $W$ to synthesize maxim $R$, it can obtain the membership degree of the evaluated object to the each evaluation grade, making the result vector of the dimming comprehensive evaluation to be $S=(s_1,s_2,\cdots,s_n)$ , then , $S=W\circ R$ , in it , $\circ$ is the dimming operator symbol. Because dimming operator symbols are different, so the corresponding dimming comprehensive evaluation models are different. This paper adopts comparison operator symbol Zadeh, after the $S$ calculation for the selected dimming operator symbol, it needs normalizing the $S$, and making it to be $\sum S_j = 1$ .

(6) The solution of Combined with Analytic Hierarchy Dimming Comprehensive Evaluation

Using analytic hierarchy process to get the weight, and then calculate the Smith matrix.

In the same way, the matrix of other seismic regions is obtained, and the 15 order matrix is obtained in this paper. After the final determination of the level of the earthquake disaster area to give the evaluation results.

### 4.3.2 Comparison between model and actual results

Table 6 shows the comparison according to establish their mathematical expressions drawn the recovery of the affected areas of priority and the reality of the specific circumstances of the finally shows that the mathematical expression can response to the earthquake damage, and also the factors of the disaster, earthquake rescue team can use the mathematical model of specific search and rescue power allocation scheme is obtained.

Tab.6 Comparison between priority and disaster assessment results of Wenchuan earthquake

## 5. CONCLUSION

The main factors to determine the effect of earthquake rescue priority level, have buried personnel quantity, weather conditions, terrain conditions, traffic conditions of these four aspects, and were to be discussed, by using the method of mathematical modeling of the scene of the earthquake rescue priority levels to determine and entering Wenchuan earthquake examples calculated, comparison is carried out through the calculation results and the actual situation that the mathematical expression can get relatively accurate specific priority evaluation method and help make the earthquake disasters rescue force with reasonable scheme, but also has a great practical significance to earthquake on-site search and rescue work.

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# Quantitative Assessment of the Influence of the Maritime Silk Road Development Strategy to the Economy of China based on the Analytic Hierarchy Process

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Abstract: Through the analysis of the factors affecting the development of Chinese industry, the paper establishes Analytical Hierarchy Process (AHP) assessment model, and adopts the 1~9 scales method and the index judgment matrix to establish the relationship among various factors. Then through the establishment of the normalized matrix model, we can get the influence of the Maritime Silk Road over the years. Results being obtained by the model analysis, the development strategy of the Maritime Silk Road has great influence, and provides a great opportunity for China's industrial economic development abroad.

Keywords: Maritime Silk Road; Development strategy; Analytic Hierarchy Process; Influence

## 1. INTRODUCTION

Since started in the Qin and Han Dynasties, the Maritime Silk Road has been an important economic and cultural bridge between the East and West, and the Southeast Asia has always been an important hub and part of the Maritime Silk Road. Chinese General Secretary of CPC Xi Jinping proposed the strategic concepts of constructing the Silk-Road Economic Belt and the Maritime Silk Road in 21st Century. For China, the most essential meaning of the development strategy is to promote the rapid development of the national economy. Therefore, a scientific and objective evaluation on the impact of the development strategy of "One Belt and One Road" can provide the gist for the relevant department to evaluate the effect of major policies, and lay the foundation for the formulation of further economic development policy.

Influence is defined as the effect of one thing, by its own value, on the other. Quantitative assessment study had a lot of. For example, through AHP, Wang Yong presented a quantitative evaluation index system for e-commerce sites, and establish the evaluation model of a linear function to evaluate e-commerce sites[1]; Based on the quantitative analysis, Chen to evaluate the risk of water conservancy project construction[2];Zhao provides a quantitative analysis on the evaluation of tourism development level during the Shanghai World Expo, and establishes the evaluation model of Fuzzy Analytic Hierarchy Process[3], Therefore, the key point of evaluating the influence of the development strategy of "One Belt and One Road" lies in the quantization of influence, a vertical comparison of the marine economic indicators over the years and the selection of a recognized evaluation side. To solve this problem, this paper firstly established the evaluation indicator, and then applied the AHP to the quantization process of indicators, built the comprehensive evaluation model of "The Belt and Road" development strategy.

## 2. The ESTABLISHMENT OF THE MODEL AND THE SOLUTION

In order to evaluate the influence of "One Belt and One Road" strategy on Chinese industry, we choose four factors as a measure of the influence: (1) the volume of steel exports, reflecting the impact of this strategy in solving the excess capacity; (2) the crude oil import volume and the dependence on foreign oil, reflecting the influence of this strategy on the petroleum reserve; (3) the import volume of non-ferrous metals, reflecting the impact of this strategy in the protection of basic industries; (4) ocean freight volume, reflecting the impact of this strategy on the marine economy. Compared with that of the crude oil imports volume, the date of crude oil's dependence on foreign countries can reflect the impact of this strategy more exactly in solving the problem of excess capacity. So the amount of crude oil imports can be left out when conducting data analysis. Information is shown in Tab.1.

Table 1.Parameters related to the Maritime Silk Road over the years (Date from China National Bureau of Statistics)

| Year | The volume of steel exports | The dependence on foreign oil | The import volume of non-ferrous metals | Ocean freight volume (10000 tons) |
|---|---|---|---|---|

| | (10000 tons) | (%) | (10000 tons) | |
|---|---|---|---|---|
| 2005 | 2052 | 42.9 | 142 | 48549 |
| 2006 | 4301 | 47.0 | 97 | 54413 |
| 2007 | 6265 | 47.2 | 173 | 58903 |
| 2008 | 5923 | 49.8 | 170 | 42352 |
| 2009 | 2460 | 51.3 | 347 | 51733 |
| 2010 | 4256 | 54.8 | 338 | 58054 |
| 2011 | 4888 | 56.5 | 329 | 63542 |
| 2012 | 5573 | 56.7 | 398 | 65815 |
| 2013 | 6233 | 57.0 | 368 | 71156 |
| 2014 | 9378 | 59.6 | 340 | 74733 |

The impact of various parameters on the Maritime Silk Road are positively correlated, that is, the greater the value of the parameter, the greater the influence. The data will be normalized. We obtain the results shown in Tab.2.

Table 2.Results after normalization

| Year | The volume of steel exports (10000 tons) | The dependence on foreign oil (%) | The import volume of non-ferrous metals (10000 tons) | Ocean freight volume (10000 tons) |
|---|---|---|---|---|
| 2005 | 0.03998 | 0.08206 | 0.05255 | 0.08239 |
| 2006 | 0.08379 | 0.08990 | 0.03590 | 0.09234 |
| 2007 | 0.12206 | 0.09028 | 0.06403 | 0.09996 |
| 2008 | 0.11539 | 0.09526 | 0.06292 | 0.07187 |
| 2009 | 0.04793 | 0.09813 | 0.12842 | 0.08779 |
| 2010 | 0.08292 | 0.10482 | 0.12509 | 0.09852 |
| 2011 | 0.09523 | 0.10807 | 0.12176 | 0.10784 |
| 2012 | 0.10857 | 0.10845 | 0.14730 | 0.11169 |
| 2013 | 0.12143 | 0.10903 | 0.13620 | 0.12076 |
| 2014 | 0.18270 | 0.11400 | 0.12583 | 0.12683 |

## 2.1 ESTABLISHMENT OF INDEX WEIGHT

In this paper, we use the judgment matrix of AHP [4] to determine the weight of each index, and the hierarchical structure diagram is shown in Fig.1.

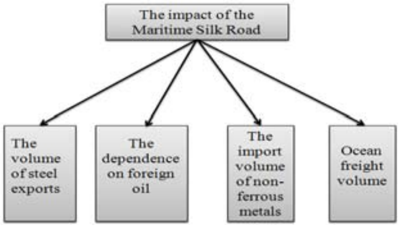
The impact of the Maritime Silk Road
The volume of steel exports
The dependence on foreign oil
The import volume of non-ferrous metals
Ocean freight volume

Figure 1.The hierarchical structure diagram of the impact of the Maritime Silk Road

Then, according to the theory of AHP and the 1~9 scale method [5-7], the judgment matrix of indicators, as shown in Tab.3, is constructed.

Table 3.The judgment matrix of indicators

| Indicators | The volume of steel exports | The dependence on foreign oil | The import volume of non-ferrous metals | Ocean freight volume |
|---|---|---|---|---|
| The volume of steel exports | 1 | 4/5 | 2 | 4/3 |
| The dependence on foreign oil | 5/4 | 1 | 5/2 | 5/3 |
| The import volume of non-ferrous metals | 1/2 | 2/5 | 1 | 2/3 |
| Ocean freight volume | 3/4 | 3/5 | 3/2 | 1 |

Through MATLAB [6], we can calculate the maximum eigenvalue and eigenvector of the matrix:

$$\lambda_{\max} = 4W = [-0.5443, -0.6804, -0.2722, -0.4082]^T \tag{1}$$

We deal with the eigenvector, and get the normalized weight vector of each indicator:

$$\omega = [0.2857, 0.3571, 0.1429, 0.2143]^T \tag{2}$$

## 2.2 SOLUTION OF INFLUENCE

The index normalized matrix is named as A, and the impact of the Maritime Silk Road over the years ($I$) can be written as follows:

$$I = A\omega \tag{3}$$

Then we get the influence of the Maritime Silk Road over the years as shown in Tab.4.

Table 4.The influence of the Maritime Silk Road over the years

| Year | Impact |
|---|---|
| 2005 | 0.2564 |
| 2006 | 0.2681 |
| 2007 | 0.2596 |
| 2008 | 0.2645 |
| 2009 | 0.2371 |
| 2010 | 0.2434 |
| 2011 | 0.2456 |
| 2012 | 0.241 |
| 2013 | 0.2441 |
| 2014 | 0.2513 |

The influence of the Maritime Silk Road with time changes in line chart as shown in Fig.2, which is mapped by Excel[7].

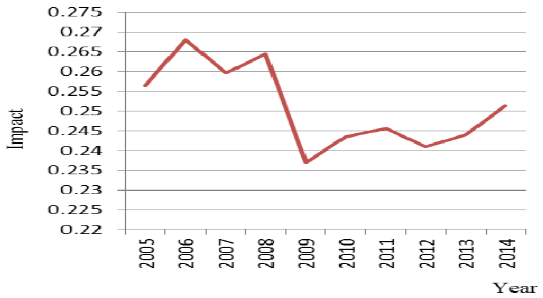

Figure 2.The influence of the Maritime Silk Road with time change line chart

Through the analysis of the data in Tab.4 and the influence trend of Maritime Silk Road in Fig.2, the influence of the Maritime Silk Road on the economy of China is tend to be greater and basically in steady before 2008. However, with the advent of the 2008 economic crisis, the exports of China has been greatly affected. The economic growth rate has declined, though the influence appears a rebound later, only continue at a modest pace. From Fig.2, with the advent of "One Belt and One Road" development strategy in 2013, the influence of the Maritime Silk Road increased obviously, showing that the propose of the strategy brings a huge economic impact on the economy of China.

## 3. CONCLUSIONS

This paper establishes the evaluation model with AHP, to evaluate the influence of the development strategy of the Marine Silk Road on the industry of China. We have considered synthetically four indicators such as the volume of steel exports, the dependence on foreign oil, the import volume of non-ferrous metals and the ocean freight volume. The judgment is of great reference value, and the model is able to decompose the complex problems; the conclusion is relatively objective and reasonable, and has a strong practical significance, based on which a theoretical reference for the decision-making layer to make the right decision can be provided. Similarly, the model can be applied to assess the impact of other major policy, which contributes to the formulation of national economic development plans.

## ACKNOWLEDGMENT

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# Comprehensive Evaluation and Empirical Analysis of Urban Competitiveness in Hebei Province

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Abstract： City - the basic unit of economic globalization and regional production and trade of the carrier, its prosperity for a regional, national and global economic prosperity plays an important role, and how to scientific and effectively evaluate urban competitiveness has become the focus of numerous studies. This study was based on a selection principle of comprehensive evaluation and Hebei Province in 2014 Statistical Yearbook of data, Select 16 index, includes GDP, total social investment, investment in education, public transport operators and other indicators, divided into economic, social, education, infrastructure, and evaluated four levels of competitiveness of Hebei Province, 11 prefecture-level cities. First, to avoid the impact of data point and magnitude of indicators, the original data standardization 0-1; second, to determine the weight of each index and weight of each level by the use of information entropy method; third, to evaluate and sequence a number of indicators about each level by gray correlation method, finally, to evaluate and sequence the four levels using weight RSR joint. The evaluation results both from a single level of competitiveness, or from the overall comprehensive competitiveness, can evaluate and ranking the 11 prefecture-level cities in Hebei Province.

Key words: Urban Competitiveness; Information Entropy Method; Gray Correlation Assessment; Weighted RSR Method

## 1. INTRODUCTION

Facing the development of economy and technology and the globalization of economy .Cities around the world are facing challenges. How to use and develop the city’s land, talent, education, industry , market, the image of the city and other resources, how to provide more high-quality jobs ,how to attract foreign capital investment, how to effectively promote the rapid development of urban economy, society, humanities and so on. It is gradually become a major problem, especially in the developing city competitiveness of the city can’t be ignored.

There are many studies on urban competitiveness, Zheng Xin used DEA to evaluate city competitiveness firstly, there are some limits in the CCR model, it promote CCRMP model and DEA-AHP model so as to improve CCR model on processing abnormal data, limiting weights and putting efficient unites in order, then used these models to evaluate 26 cities’ competitiveness of China.[1-9] Wei Qiang carried on the comparative analysis to the cities of Fujian province from six aspects including general economic strength, infrastructure and service facilities, the degree of opening up, conditions of the urban environment, human resources and citizen diathesis, the level of government management, and carried on PCA method and cluster analysis to the selected data of index system through the SPSS software and it reaches the city’s competitiveness score and ranking; finally combining the advantage and disadvantage analysis of urban development of Fujian, paper propose the strategy how to promote the competitiveness of Fujian cities. [8]Lu Hongping, Dong Zhengxin and Wu Wei based on the scientific, comprehensive, maneuverable and guiding principles, a set of indicator system which evaluating the urban competitiveness evaluation is proposed, by gray correlation analysis method, the relational degree is confirmed and by analytic hierarchy process, the weight is confirmed and corrected by information entropy law which makes it more objective.[3] Urban Competitiveness conceptual model, $C = f(U, N, T, F)$ is proposed by the American professor Denis. C represents the international influence of the metropolitan area, U woven into international trade and international investment and other commercial activities of the local urban environment, N is the national factors affecting the international competitiveness of the metropolitan area, T is the mean intensity of clothes on international trade treaties, F refers to the international competitiveness of local businesses and industries.[10]

This study based on the 16 kinds of index of four indicators, in the single class and the overall index, evaluated the competitiveness of 11 cities in Hebei Province by using synthetically entropy, gray correlation and weighted RSR method.

## 2. INTRODUCTION OF INTEGRATED EVALUATION MODEL

### 2.1RESEARCH IDEAS OF INTEGRATED EVALUATION MODEL

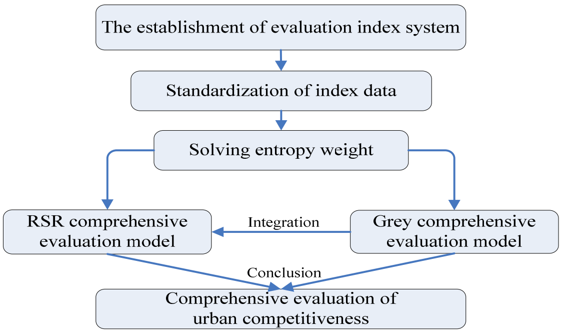
The establishment of evaluation index system
Standardization of index data
Solving entropy weight
RSR comprehensive evaluation model
Integration
Grey comprehensive evaluation model
Conclusion
Comprehensive evaluation of urban competitiveness

Figure 1. Research plan of integrated evaluation model

Through access to the data, and according to city competitiveness evaluation index system establishment principle, determine the evaluation index system. Based on standardized data, used entropy method to solve the low layer of the index weights, and via the correspondence relation determined weight of four levels. [1] Integrated a number of indicators on a single level data, given the level of the competitiveness of each city rankings, secondly, according to the four aspects of the city's rank, the rank sum ratio method is used to make a comprehensive evaluation of each city. So, whether it is from the single level or the comprehensive level can give the competitive ranking of each city in Hebei province.

## 2.2THE ESTABLISHMENT OF EVALUATION INDEX SYSTEM OF URBAN COMPETITIVENESS

Comprehensive evaluation of urban competitiveness, basis is to determine the evaluation index system. The evaluation index system of urban competitiveness is by multiple interrelated, mutual effect evaluation index, according to a hierarchical structure consisting of an organic whole. Evaluation index system of urban competitiveness is link evaluation of experts and evaluation objects, as well as bridge connecting the evaluation methodology and object.[2] Only the scientific and reasonable city competitiveness evaluation index system, comprehensive evaluation before it is possible to draw the scientific conclusion.

Based on the evaluation index system of urban competitiveness, according to the statistical data of Hebei Province in 2014, select the following 16 evaluation indicators. Among them, the unit of GDP is billion yuan, foreign direct investment units is million dollars, the unit of total number, employment and higher school the number of students is million people, the whole society total investment, educational investment and finance income units is million yuan, commercial housing sales price of the unit is yuan/square meters, [4]units of disposable income is yuan and total sown area of crops is thousand hectares, units of the number of industrial enterprises is a, public library collection unit is million copies, public transport vehicles operating unit is car, garden and green areas of the units is hectares.

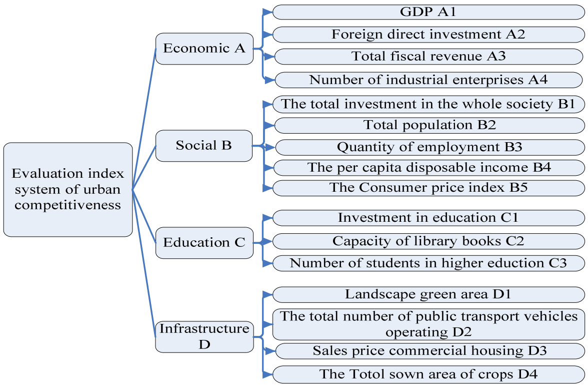
Evaluation index system of urban competitiveness
Economic A
GDP A1
Foreign direct investment A2
Total fiscal revenue A3
Number of industrial enterprises A4
Social B
The total investment in the whole society B1
Total population B2
Quantity of employment B3
The per capita disposable income B4
The Consumer price index B5
Education C
Investment in education C1
Capacity of library books C2
Number of students in higher eduction C3
Infrastructure D
Landscape green area D1
The total number of public transport vehicles operating D2
Sales price commercial housing D3
The Totol sown area of crops D4

Figure 2. Comprehensive evaluation index system of urban competitiveness

## 2.3STANDARDIZATION OF INDEX DATA

Because there are different units and orders of magnitude, the evaluation indicators can't be directly compared and calculated, in order to ensure the scientific and rationality of the results, the original data need to be standardized.[5] Here, using the standard 0-1 transform method, the formula is as follows:

High-priority indicators / positive indicators: $b_{ij}=\dfrac{a_{ij}-a_j^{\min}}{a_j^{\max}-a_j^{\min}}$ (1)

Low-priority indicator / reverse indicator: $b_{ij}=\dfrac{a_j^{\max}-a_{ij}}{a_j^{\max}-a_j^{\min}}$ (2)

Among them, $a_j^{\max}$ and $a_j^{\min}$ respectively represent the maximum and minimum values of the $j$-th indicators in all samples. In order to avoid the impact of the unit and the order of magnitude, the following models are based on the standard data.

## 2.4INTRODUCTION OF ENTROPY WEIGHT METHOD FOR SOLVING WEIGHTS

The concept of entropy in information theory was first introduced by Shannon, with the continuous development, the information entropy concept has been widely used in engineering and socio-economic fields. At the same time, the entropy weight method is the method of a kind of objective weight, according to the degree of variation of each index, computed entropy weight of each index by using information entropy, [6]and then through entropy weight of each index is modified, thus obtains the more objective index weight.

The information entropy formula shows, if a entropy index is smaller, indicating its index greater the degree of variation is worth, the more the amount of information provided in the comprehensive evaluation of the index, the greater the role of such weight relative becomes.

(1)Calculating the proportion of the $j$ index value of the first $i$ of the city:

$$Y_{ij} = \frac{b_{ij}}{\sum_{i=1}^{m} b_{ij}}$$

(2)Calculating the index information entropy

$$e_j = -\frac{1}{\ln m} \sum_{i=1}^{m} (Y_{ij} \times \ln Y_{ij})$$

Among them, if $Y_{ij} = 0$, $\lim_{Y_{ij} \to 0} Y_{ij} \ln Y_{ij} = 0$ is defined.

(3) Calculating the index weight

$$w_j = \frac{1-e_j}{\sum_{j=1}^{n}(1-e_j)}$$

## 2.5 INTRODUCTION OF GREY COMPREHENSIVE EVALUATION MODEL

In the objective world, relations between many factors are gray, we can't distinguish what factors are closely related and which are not close, so it is difficult to find the principal contradiction and the main features. As an evolving system, in fact, gray correlation degree analysis is a dynamic process of development trend. [7]Specifically the exact point is quantitative comparative analysis of the development trend, and its essence is analyzed and compared among several curve geometry. The basic idea is based on sequence similarity curve geometry to determine the extent of their contact is close, curve closer, then evolving situation closer, the degree of association greater. On the contrary, the less. The calculation procedure is as follows:

(1) Standardized processing of 0-1 index value;

(2) Confirming the reference sequence $x_0$;

(3) Confirming the compared sequence $x_i$;

(4) Solving the correlation coefficient;

For a reference sequence $x_0$, the comparing sequence is $x_i$, we can express the differences between every comparing curves and reference curves at every point in this relationship:

$$\xi_i(k) = \frac{\min_i \max_k |x_0(k) - x_i(k)| + \zeta \max_i \max_k |x_0(k) - x_i(k)|}{|x_0(k) - x_i(k)| + \zeta \max_i \max_k |x_0(k) - x_i(k)|} \quad (3)$$

In this equation, $\xi_i(k)$ is a relative difference of the kth index comparison curve $x_i$ with the reference curve $x_0$, and the relative value of the said $x_i$ to $x_0$ in the correlation coefficient of K index. $\zeta$ is the resolution factor, $\zeta \in [0,1]$, and it is introduced to reduce the influence of the extreme value on the calculation. In actual use, should be based on the degree of correlation between sequence resolution coefficient selections, generally the most appropriate $\zeta \le 0.5$.

(5) Solving the grey weighted correlation coefficient of the sample;

The correlation coefficient only expresses the degree of association between every indicator statistics. Considering the difference of weights between all indicators, we aim to compare the absolute degree of association between overall curve $x_i$ and reference curve $x_0$. We can use the Gray weight relation to present, the formula is:

$$r_{0-i} = \frac{1}{n} \sum_{k=1}^{n} w_k \xi_i(k) \quad (4)$$

(6) The samples were sorted according to the grey weighted correlation coefficient.

## 2.6INTRODUCTION OF RSR COMPREHENSIVE EVALUATION MODEL

RSR namely Rank-sum Ratio, collecting the respective merits of classical parameter estimation and modern non-parametric estimation methods in statistical analysis of one, [10]which is the average of the rows table (or column) Rank times, is a non-parametric measurement, with 0 ~ 1 continuous interval variables. In the comprehensive evaluation, RSR integrated a number of information of index, indicating the level of a plurality of evaluation index, the greater the value, the more gifted RSR. The calculation steps are:

(1) To list raw data table and compile rank;

(2) To calculate the weighted RSR and direct sequencing;

Duo to the weight of each evaluation index is different, so the RSR is calculated as:

$$wRSR_i = \frac{1}{n} \sum_{j=1}^{m} w_j R_{ij}$$

Among them, $w_j$ is the weight of the j-th index weight, and $\sum_{j=1}^{m} w_j = 1$.

(3) To determine the distribution of wRSR (calculate probability unit);

(4) To calculate the linear regression equation;

(5) Grading and sorted.

## 3. URBAN COMPETITIVENESS EVALUATION OF PREFECTURE-LEVEL CITIESIN HEBEI PROVINCE

### 3.1TO DETERMINE THE WEIGHT OF EACH EVALUATION INDEX

Due to the index system of the three major categories of 16 indicators are high-priority indicators, so choose formula (1) to standardize the original data.

Using entropy method to solve the index information entropy and weights, the results in Tab.1:

Table 1.the index information entropy and weights

| index | A1 | A2 | A3 | A4 | D1 | D2 | D3 | D4 |
|---|---|---|---|---|---|---|---|---|
| $e_j$ | 0.866 | 0.980 | 0.969 | 0.975 | 0.971 | 0.959 | 0.964 | 0.986 |
| $w_j$ | 0.157 | 0.024 | 0.036 | 0.030 | 0.034 | 0.048 | 0.042 | 0.016 |
| index | B1 | B2 | B3 | B4 | B5 | C1 | C2 | C3 |
| $e_j$ | 0.953 | 0.952 | 0.887 | 0.902 | 0.925 | 0.985 | 0.999 | 0.875 |
| $w_j$ | 0.055 | 0.057 | 0.133 | 0.115 | 0.088 | 0.018 | 0.001 | 0.146 |

### 3.2LOW LEVEL GREY COMPREHENSIVE EVALUATION

The index system of the present study is divided into 4 categories and 16 indicators, in order to obtain urban competitiveness index rankings in each category, [11] taking gray evaluation of classification, that is, for each category indicators individually gray comprehensive evaluation.

On the economic level, the optimal value of each type of indicators is chosen as a reference sequence, namely:

$$x_0 = \{1.000,1.000,1.000,1.000\}$$

Each city were recorded as confirming the compared sequence $x_i,(i = 1,\cdots,11)$ . Taking distinguish coefficient $\zeta = 0$ , and the correlation coefficient matrix $\xi$ is calculated according to the formula (3).

$$\xi = \begin{bmatrix} 1.064 & 0.999 & 1.553 & 1.594 \\ 0.546 & 0.531 & 0.584 & 0.545 \\ 0.549 & 0.606 & 0.613 & 0.547 \\ 0.538 & 0.828 & 0.597 & 0.531 \\ 1.594 & 1.594 & 1.594 & 0.818 \\ 0.601 & 0.745 & 0.837 & 0.688 \\ 0.701 & 0.764 & 0.757 & 0.893 \\ 0.715 & 0.656 & 0.735 & 1.034 \\ 0.531 & 0.581 & 0.531 & 0.665 \\ 0.572 & 0.658 & 0.564 & 0.671 \\ 0.721 & 0.906 & 0.736 & 0.688 \end{bmatrix}$$

According to the formula (4), the weighted grey correlation coefficients of 11 cities are shown in Tab.2:

Table 2.Grey weighted correlation coefficient and ranking of cities in economic level

| Cities | Shijiazhuang | Cheng De | Zhangjiakou | Qinhuangdao | Tang Shan | Lang Fang | Bao Ding | Cang Zhou | Heng Shui | Xing Tai | Han Dan |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $r_i$ | 0.074 | 0.034 | 0.035 | 0.035 | 0.093 | 0.041 | 0.046 | 0.046 | 0.034 | 0.036 | 0.045 |
| Rank | 2 | 7 | 6 | 6 | 1 | 8 | 3 | 3 | 7 | 5 | 4 |

Tab. 2 shows the competitiveness ranking of the 11 cities in Hebei province at the economic level. From which we can see that Tangshan is ranked first, and Shijiazhuang in the second place. In the same way, we can find out the ranking of 11 cities on the three levels of social, educational and infrastructure, as shown in Tab. 3:

Table 3. Grey weighted correlation coefficient and ranking of cities in three levels of society, education and infrastructure

| Cities | Society | | Education | | Infrastructure | |
|---|---|---|---|---|---|---|
| | $r_i$ | Rank | $r_i$ | Rank | $r_i$ | Rank |
| Shijiazhuang | 0.135 | 1 | 0.055 | 1 | 0.047 | 1 |
| Cheng De | 0.062 | 11 | 0.019 | 7 | 0.022 | 8 |
| Zhangjiakou | 0.067 | 10 | 0.019 | 7 | 0.023 | 7 |
| Qinhuangdao | 0.073 | 8 | 0.025 | 3 | 0.032 | 3 |
| Tang Shan | 0.133 | 2 | 0.022 | 4 | 0.036 | 2 |
| Lang Fang | 0.108 | 4 | 0.020 | 6 | 0.030 | 4 |
| Bao Ding | 0.122 | 3 | 0.031 | 2 | 0.029 | 5 |
| Cang Zhou | 0.082 | 7 | 0.020 | 6 | 0.025 | 6 |
| Heng Shui | 0.068 | 9 | 0.018 | 8 | 0.021 | 9 |
| Xing Tai | 0.094 | 6 | 0.019 | 7 | 0.025 | 6 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Han Dan | 0.100 | 5 | 0.021 | 5 | 0.032 | 3 |

From Tab. 2 and Tab.3, we can see that in the different level, the ranking of each city is different, among them Shijiazhuang both society, [13] education and infrastructure level ranked first, and Tangshan won the first prize in economic level. In order to compare the overall competitiveness of the 11 cities, the RSR method will be used to calculate it.

## 3.3HIGH LEVEL GREY COMPREHENSIVE EVALUATION

From the results of gray comprehensive evaluation at all levels of Tab. 2 and Tab. 3, it can be compiled rank in Tab. 4:

Table 4. The rank and weighted RSR of 11 cities in Hebei Province on the four levels

| Cities | Economic A | Society B | Education C | Infrastructure D | $wRSR$ |
|---|---|---|---|---|---|
| Shijiazhuang | 2 | 1 | 1 | 1 | 0.113 |
| Cheng De | 9.5 | 11 | 9 | 10 | 0.924 |
| Zhangjiakou | 7.5 | 10 | 9 | 9 | 0.825 |
| Qinhuangdao | 7.5 | 8 | 3 | 3.5 | 0.583 |
| Tang Shan | 1 | 2 | 4 | 2 | 0.189 |
| Lang Fang | 11 | 4 | 6.5 | 5 | 0.571 |
| Bao Ding | 3.5 | 3 | 2 | 6 | 0.307 |
| Cang Zhou | 3.5 | 7 | 6.5 | 7.5 | 0.557 |
| Heng Shui | 9.5 | 9 | 11 | 11 | 0.885 |
| Xing Tai | 6 | 6 | 9 | 7.5 | 0.610 |
| Han Dan | 5 | 5 | 5 | 3.5 | 0.435 |
| Weight | 0.246 | 0.448 | 0.165 | 0.141 | |

In order to determine the distribution of $wRSR$ , obtained in Tab. 5

Table 5. Weighted rank sum ratio of 11 cities in Hebei Province, such as frequency, cumulative frequency, probability unit and so on.

| Cities | $f$ | $\sum f$ | $\tilde{R}$ | $\overline{R}$ | $(\overline{R}/n)\times 100\%$ | $probit$ |
|---|---|---|---|---|---|---|
| Shijiazhuang | 1 | 1 | 1 | 1 | 9.1 | 3.67 |
| Tang Shan | 1 | 2 | 2 | 2 | 12.2 | 3.84 |
| Bao Ding | 1 | 3 | 3 | 3 | 27.3 | 4.40 |
| Han Dan | 1 | 4 | 4 | 4 | 36.4 | 4.65 |
| Cang Zhou | 1 | 5 | 5 | 5 | 45.5 | 4.89 |
| Lang Fang | 1 | 6 | 6 | 6 | 54.5 | 5.11 |
| Qinhuangdao | 1 | 7 | 7 | 7 | 63.6 | 5.35 |
| Xing Tai | 1 | 8 | 8 | 8 | 72.8 | 5.61 |
| Zhangjiakou | 1 | 9 | 9 | 9 | 81.2 | 5.89 |
| Heng Shui | 1 | 10 | 10 | 10 | 90.9 | 6.33 |
| Cheng De | 1 | 11 | 11 | 11 | 97.7 | 7.00 |

Using statistical software, using $probit$ as the independent variable and $wRSR$ as the dependent variable, to do regression analysis. The results are shown in Tab. 6 and Tab. 7:

Table 6. ANOVA of regression equation

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | .692 | 1 | .692 | 179.631 | .000$^{a}$ |
| | Residual | .035 | 9 | .004 | | |
| | Total | .726 | 10 | | | |

a. Predictors: (Constant), probit.

b. Dependent Variable: wRSR.

Table 7. Coefficient analysis of regression equation

| Model | Unstandardized Coefficients | | standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | (Constant) | -.785 | .101 | | -7.770 | .000 |
| | probit | .258 | .019 | .976 | 13.403 | .000 |
| a. Dependent Variable: wRSR | | | | | | |

From the Tab. 6 and Tab. 7 can be seen, whether it is the F test the regression equation or T test of regression coefficient, the results are good. From Tab. 7 we can see that the regression equation is:

$$wRSR = -0.785 + 0.258 * probit$$

By regression equation, the estimated value $\widehat{wRSR}$ and the competitiveness of the cities are ranked in Tab. 8:

Table 8. Weighted RSR estimates and ranking of the cities' comprehensive competitiveness

| Cities | Shijiazhuang | Tang Shan | Bao Ding | Han Dan | Cang Zhou | Lang Fang | Qinhuangdao | Xing Tai | Zhang jiakou | Heng Shui | Cheng De |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $\widehat{wRSR}$ | 0.162 | 0.205 | 0.350 | 0.414 | 0.476 | 0.533 | 0.595 | 0.662 | 0.734 | 0.848 | 1.020 |
| Rank | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

We can be seen from Tab. 8, in the overall level Shijiazhuang and Tangshan occupy respectively first and second place. Whether unilaterally or in general, Shijiazhuang and Tangshan occupy the top two, and other cities have a certain gap.

## 4. CONCLUSIONS

This study was based on a comprehensive evaluation and principles established in Hebei Province in 2014 Statistical Yearbook of the data, choose 16 indicators GDP, total social investment, investment in education, public transport operators and other vehicles, divided into economic, social, education, infrastructure Amenities four levels of competitiveness of Hebei Province 11 prefecture-level cities were evaluated.

To avoid affecting the data index units and orders of magnitude, we use data standardization and comprehensive information entropy method to determine the weight of each index, gray comprehensive evaluation of a number of indicators to evaluate every aspect of the sort, and the weighted RSR four levels of joint The results compiled rank ordering, Whether it is from a single level of 11 prefecture-level city in Hebei province to evaluate the overall ranking or a comprehensive evaluation of competitiveness rankings, are able to give more accurate conclusions.

On the economic level, Tangshan, as a veteran city of the province, won the first place, the second place is the provincial capital city, Shijiazhuang. These two cities in resources, capital, or in talent aggregation, ability to attract foreign investment in the province is a great advantage.

On the social and infrastructure level, first and second are the Shijiazhuang and Tangshan, [12]which are open to the province's first and fastest-growing economic strength largest city, so the living standards of the residents, the city's infrastructure, etc. Are more impressive. The Chengde and Zhangjiakou relatively weak on these two levels may be due to these two cities is relatively northerly, social environment and urban construction is relatively backward.

And in the education level, the Shijiazhuang city still ranked first, Qinhuangdao and Tangshan City, third and fourth respectively. Universities in Hebei Province, Shijiazhuang, Tangshan and Qinhuangdao ratio greater share of its investment in education may not too little. But how to retain talent and make contribution for the cities and provinces, city managers need to raise incentives and other strategies.

This study is based on 2014 data Hebei Statistical Yearbook, various evaluation methods are used to evaluate the prefecture-level city in Hebei province, the results obtained, although maybe have a little deviations from the actual situation, but reflect Competitiveness of different cities in Hebei Province is possible.

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# An Analysis on the States in Social Situation of Graduate Satisfaction by SPA

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Abstract: As for the problems that graduate satisfaction of social analysis qualitative research is more, quantitative research is fewer, we put the set pair analysis method (SPA) in the application of university graduate satisfaction trend analysis and get each situation in which the level indicators, reflecting the quality of graduates on the macro. It provides an idea for the quantitative analysis satisfaction, we hope it has a certain significance on satisfaction analysis for the future.

Key words: Set pair analysis, Situation analysis, Satisfaction

## 1. INTRODUCTION

On the one hand，social satisfaction to graduates reflects the degree of social recognition of school fosters the talent, it is also a standard to measure the quality of school education. According to the understanding of the present situation of graduate work unit and the satisfaction of their work, we can grasp the employment market demand for talents to some extent. So it has always been a hot topic of people. Many scholars has carried on the qualitative analysis with statistical method, this article will carry on the quantitative analysis from the set pair analysis point of view and reflect the problems existing in the graduate more objective and comprehensive.

Jiang Yunliang takes advantage of difference and counter tendency sequencing to analyze the student performance, revealing information about student achievement contains, [1] Zhang Linfeng also gives four-element connection number posture ordering and applied to the physical education and sports systems engineering. [2-3] In this paper, with the help of four-element connection number for social satisfaction for situation analysis of some school graduates, it perhaps has a certain guiding significance on the satisfaction analysis for the future.

## 2. PRELIMINARIES[4]

Contact degree is a very important concept of set pair analysis, their meanings are as follows:

**Definition 1** Given two sets $A$ and $B$, and set up a collection of two sets of $H=(A,B)$, in the background of a particular issue (set $W$), analyzes features of set $H$, there are $N$ characteristics obtained, where: there are $S$ characteristics in a set of two sets $A$ and $B$ have in common; there are $P$ characteristics antithetical, on the remaining $F=N-S-P$ characteristics neither opposing nor have in common, claimed ratio: $S/N$ is the same degree of $A$ and $B$ at $W$; $F/N$ is the degree of difference at $W$; $P/N$ is the degree of opposition; with formula

$$u(W)=\frac{S}{N}+\frac{F}{N}i+\frac{P}{N}j$$

representing. Where $u$ is called contact degree of $A$ and $B$. In general, what we said in the text $u$ refers to a system or two collections in a particular background to the issue was the same degree, difference degree and contrary degree algebraic sum, therefore, $u$ is often referred to as contact of expression. However, it usually can be seen as a number in operation, we call for the connection number. The general form of four - element connection number is:

$$u=a+bi+cj+dk \tag{1}$$

Where $a$ is the same degree component, $b$ is the difference with the partial component, $c$ is the difference partial anti components, $d$ is the antithesis of the component, they are referred to as the contact component, $\forall a,b,c,d\in[0,1]$, $i\in[0,1]$, $j\in[-1,0]$, $k=-1$, $u$ is called four - element connection number. From (1) that: $a,d$ is relatively determined, $b,c$ is relatively uncertain, $a\succ b\succ c\succ d$ ("$\succ$" is "more positive than" symbol) and satisfy the normalization condition, $u$ is the system.

**Definition 2** The contact portion sizes relations four relations identified in four relation status and evolution trend called system situation of four - element connection number.

The following description of the definition of 2: System situation includes two factors: First, the "gesture", the second is "evolutionary trend." In general, the gesture is the relationship of contact component in addition to $i,j,k$; "Evolutionary trend" refers to a change in the attitude that may occur after valuing $i,j,k$, the situation will become more complex, we need make specific analysis according to the specific context issues. Because this analysis is aiming at the "gesture", so we often combine these two aspects together, be called by a joint name "situation." In four-element connection numbers, based on the size relationship sort $a,b,c,d$, formally total of 81 species, of which there are 49 kinds of logic (Tab.1).

Table 1. Posture ordering by four-element connection number

| | | | | | |
|---|---|---|---|---|---|
| 1 | a>d | a>b | b>c | c>d | Strong potential |
| 2 | a>d | a>b | b>c | c=d | |
| 3 | a>d | a>b | b>c | c>d | |
| 4 | a>d | a>b | b=c | c>d | |
| 5 | a>d | a>b | b=c | c=d | |
| 6 | a>d | a>b | b=c | c<d | |
| 7 | a>d | a>b | b<c | c>d | |
| 8 | a>d | a>b | b<c | c=d | |
| 9 | a>d | a>b | b<c | c<d | |
| 10 | a>d | a=b | b>c | c>d | Weak potential |
| 11 | a>d | a=b | b>c | c=d | |
| 12 | a>d | a=b | b>c | c<d | |
| 13 | a>d | a=b | b=c | c>d | |
| 14 | a>d | a=b | b<c | c>d | |
| 15 | a>d | a<b | b>c | c>d | Micro potential |
| 16 | a>d | a<b | b>c | c=d | |
| 17 | a>d | a<b | b>c | c<d | |
| 18 | a>d | a<b | b=c | c>d | |
| 19 | a>d | a<b | b<c | c>d | |
| 20 | a=d | a>b | b=c | c<d | Strong balance |
| 21 | a=d | a>b | b<c | c>d | |
| 22 | a=d | a>b | b<c | c<d | |
| 23 | a=d | a=b | b>c | c<d | Weak balance |
| 24 | a=d | a=b | b=c | c=d | |
| 25 | a=d | a=b | b<c | c<d | |
| 26 | a=d | a<b | b>c | c>d | |
| 27 | a=d | a<b | b>c | c=d | Micro balance |
| 28 | a=d | a<b | b>c | c<d | |
| 29 | a=d | a<b | b=c | c>d | |
| 30 | a=d | a<b | b<c | c>d | |
| 31 | a<d | a>b | b>c | c<d | Micro against the potential |
| 32 | a<d | a>b | b=c | c<d | |
| 33 | a<d | a>b | b<c | c>d | |
| 34 | a<d | a>b | b<c | c<d | |
| 35 | a<d | a=b | b>c | c<d | Weak against the potential |
| 36 | a<d | a=b | b=c | c>d | |
| 37 | a<d | a=b | b=c | c<d | |
| 38 | a<d | a=b | b<c | c>d | |
| 39 | a<d | a=b | b<c | c=d | |
| 40 | a<d | a=b | b<c | c<d | |
| 41 | a<d | a<b | b>c | c>d | Strong against the potential |
| 42 | a<d | a<b | b>c | c=d | |
| 43 | a<d | a<b | b>c | c<d | |
| 44 | a<d | a<b | b=c | c>d | |
| 45 | a<d | a<b | b=c | c=d | |
| 46 | a<d | a<b | b=c | c<d | |
| 47 | a<d | a<b | b<c | c>d | |
| 48 | a<d | a<b | b<c | c=d | |
| 49 | a<d | a<b | b<c | c<d | |

## 3. SITUATION ANALYSIS OF SATISFACTION

### 3.1 THE DATA SOURCE

A university in order to understand the social satisfaction of students conducted a survey of this school's graduates, respectively in the college of economic management, engineering and science draw an item at random of 48 graduates, collect the sample data in Tab.2 and Tab.3.

Table 2. Job performance, profession level and foreign language level of 48 graduates score data sheet

| Student no. | Job performance | Profession level | Foreign language level | Student no. | Job performance | Profession level | Foreign language level |
|---|---|---|---|---|---|---|---|
| 1 | 7 | 8 | 3 | 25 | 6 | 6 | 6 |
| 2 | 8 | 9 | 4 | 26 | 7 | 8 | 4 |
| 3 | 8 | 7 | 4 | 27 | 7 | 7 | 7 |
| 4 | 9 | 8 | 5 | 28 | 7 | 5 | 2 |
| 5 | 7 | 6 | 3 | 29 | 9 | 6 | 2 |
| 6 | 7 | 4 | 6 | 30 | 8 | 7 | 6 |
| 7 | 7 | 6 | 4 | 31 | 9 | 8 | 4 |
| 8 | 6 | 5 | 8 | 32 | 7 | 4 | 5 |
| 9 | 8 | 6 | 3 | 33 | 9 | 7 | 9 |
| 10 | 9 | 6 | 7 | 34 | 9 | 6 | 5 |
| 11 | 7 | 6 | 6 | 35 | 8 | 9 | 5 |
| 12 | 9 | 6 | 2 | 36 | 7 | 6 | 6 |
| 13 | 8 | 7 | 7 | 37 | 8 | 8 | 2 |
| 14 | 9 | 6 | 6 | 38 | 7 | 6 | 3 |
| 15 | 9 | 5 | 6 | 39 | 8 | 8 | 5 |
| 16 | 7 | 7 | 3 | 40 | 10 | 7 | 5 |
| 17 | 7 | 5 | 2 | 41 | 10 | 7 | 6 |
| 18 | 9 | 5 | 4 | 42 | 9 | 6 | 7 |
| 19 | 9 | 7 | 7 | 43 | 7 | 4 | 7 |
| 20 | 9 | 9 | 5 | 44 | 8 | 4 | 5 |
| 21 | 8 | 6 | 4 | 45 | 8 | 6 | 6 |
| 22 | 7 | 6 | 5 | 46 | 10 | 8 | 6 |
| 23 | 9 | 4 | 5 | 47 | 9 | 8 | 7 |
| 24 | 8 | 6 | 8 | 48 | 8 | 5 | 7 |

Table 3. Job performance, profession level and the foreign language level of three colleges score summary table

| Commercial college | | | Biological college | | | Medical college | | |
|---|---|---|---|---|---|---|---|---|
| Job performance | Profession level | Foreign language level | Job performance | Profession level | Foreign language level | Job performance | Profession level | Foreign language level |
| 7 | 6 | 4 | 7 | 8 | 3 | 8 | 9 | 4 |
| 9 | 6 | 2 | 8 | 7 | 4 | 9 | 8 | 5 |
| 8 | 7 | 3 | 7 | 4 | 6 | 7 | 6 | 3 |
| 9 | 6 | 6 | 6 | 8 | 5 | 9 | 6 | 2 |
| 7 | 5 | 2 | 8 | 6 | 3 | 7 | 7 | 3 |
| 9 | 5 | 4 | 7 | 6 | 6 | 9 | 9 | 5 |
| 7 | 6 | 5 | 9 | 6 | 5 | 8 | 6 | 4 |
| 9 | 4 | 5 | 9 | 7 | 4 | 7 | 5 | 2 |
| 8 | 6 | 4 | 7 | 8 | 4 | 9 | 6 | 2 |
| 6 | 6 | 6 | 9 | 8 | 4 | 8 | 9 | 5 |
| 7 | 7 | 7 | 9 | 7 | 9 | 7 | 6 | 6 |
| 8 | 7 | 6 | 10 | 7 | 5 | 8 | 8 | 2 |
| 7 | 4 | 5 | 7 | 4 | 7 | 8 | 8 | 5 |
| 9 | 5 | 6 | 8 | 4 | 5 | 10 | 8 | 6 |
| 7 | 6 | 3 | 8 | 6 | 6 | | | |
| 10 | 7 | 6 | 9 | 8 | 7 | | | |
| 9 | 6 | 7 | 8 | 5 | 7 | | | |

## 3.2 SATISFACTION DIVIDED

Work unit evaluate for their job performance, profession level and the foreign language level three aspects of performance, scoring from 0 to 10. The higher the scores are the greater the degree of satisfaction, and conventions: [7, 10] are divided into the very satisfied, [5, 7) are divided into satisfied, [3, 5) is divided into relatively satisfied, [1, 3) is divided into are not satisfied. And we take the great satisfaction as for reference, very satisfactory scores for the same component, satisfactory scores for the difference with the partial component, more satisfactory scores for the difference with the partial anti component, score is not satisfactory for the antithesis of the component.

## 3.3 THE TOTALLY SATISFACTION ANALYSIS

Counting the number of the same component, the difference with the partial component, the difference with the partial anti component and the antithesis of the component with job performance, profession level and the foreign language level, and get the scores of 48 graduates in the above three aspects of contact degree expression.

$$U_1 = \frac{47}{48} + \frac{1}{48} i + 0j + 0k \tag{1}$$

$$U_2 = \frac{20}{48} + \frac{23}{48} i + \frac{5}{48} j + 0k \tag{2}$$

$$U_3 = \frac{11}{48} + \frac{20}{48} i + \frac{12}{48} j + \frac{5}{48} k \tag{3}$$

Which $U_1$ is the contact degree expression of job performance, $U_2$ is the contact degree expression of profession level, $U_3$ is the contact degree expression of the foreign language level.

We can make the following analysis according to the Tab.1 posture ordering by four-element connection number:

(1)The analysis for the job performance of satisfaction

According (1) the society for job performance evaluation of the university graduates is: $a_1 = \frac{47}{48}, b_1 = \frac{1}{48}, c_1 = d_1 = 0,$

and $a_1 > d_1, a_1 > b_1, b_1 > c_1, c_1 = d_1$ , Tab.1 shows strong potential level 2, job performance of the school's graduate shows that society is very satisfactory. Normally job performance covers personal attitude to work, personal work performance, personal work method as well as teamwork spirit, etc. So this also indirectly reflects the students not only have serious working attitude, excellent performance and good working methods, but also be with strong teamwork spirit.

(2)The analysis for the profession level of satisfaction

According (2) the society for profession level evaluation of the university graduates is: $a_2 = \frac{20}{48}, b_2 = \frac{23}{48}, c_2 = \frac{5}{48}, d_2 = 0,$

and $a_2 > d_2, a_2 < b_2, b_2 > c_2, c_2 > d_2,$ Tab.1 shows micro potential level 15. If they relax a little bit for professional knowledge learning, it is likely to enter a state of balance; it also means that society for their profession level is only reluctantly agreed, so the school should strengthen the cultivation of students' profession level, students also should pay attention to strengthen their own professional knowledge.

(3)The analysis for the foreign language level of satisfaction

According (3) the society for foreign language level evaluation of the university graduates is: $a_3 = \frac{11}{48}, b_3 = \frac{20}{48}, c_3 = \frac{12}{48}, d_3 = \frac{5}{48},$

and $a_3 > d_3, a_3 < b_3, b_3 > c_3, c_3 > d_3$ , Tab.1 shows micro potential level 15. This illustrates the English of the school graduate just barely reached the requirements of unit of choose and employ persons, so the school should strengthen the English teaching.

(4)The brief summary

Above all, satisfaction that unit of choose and employ persons for the school graduates' work performance is relatively highest, but profession level and the foreign language level is a bit poor, just barely get approval. Aiming at this situation, the school should take active measures, conduct corresponding teaching reform and strengthen the cultivation of students' profession level as well as the English level, especially the improvement of profession English level.

### 3.4 EACH COLLEGE GRATUATE' SATISFACTION ANALYSIS

Due to different colleges to cultivate students' focus is not exactly the same, so each college graduates also have big or small difference, in order to make the results more objective and comprehensive, we make the analysis of the situation for commercial college, biological college and medical college independently. According to scores of the job performance, profession level and foreign language level that three colleges 48 graduates get, the contact degree expression are:

Commercial college:

$$U_{11} = \frac{16}{17} + \frac{1}{17}i + 0j + 0k$$

$$U_{12} = \frac{4}{17} + \frac{11}{17}i + \frac{2}{17}j + 0k$$

$$U_{13} = \frac{2}{17} + \frac{8}{17}i + \frac{5}{17}j + \frac{2}{17}k$$

Biological college:

$$U_{21} = \frac{16}{17} + \frac{1}{17}i + 0j + 0k$$

$$U_{22} = \frac{9}{17} + \frac{5}{17}i + \frac{3}{17}j + 0k$$

$$U_{23} = \frac{4}{17} + \frac{7}{17}i + \frac{6}{17}j + 0k$$

Medical college:

$$U_{31} = 1$$

$$U_{32} = \frac{8}{14} + \frac{6}{14}i + 0j + 0k$$

$$U_{33} = 0 + \frac{6}{14}i + \frac{4}{14}j + \frac{4}{14}k$$

$U_{ij}\,(j = 1,2,3)$ is the contact degree expression of job performance, profession level and the foreign language level of each college.

(1)The analysis for the commercial college' satisfaction

Job performance: $a_{11} = \frac{16}{17}, b_{11} = \frac{1}{17}, c_{11} = d_{11} = 0,$ and $a_{11} > d_{11}, a_{11} > b_{11}, b_{11} > c_{11}, c_{11} = d_{11}$, it belongs to the strong potential level 2, it is in the same situation with overall graduates job performance, namely the overall commercial college students' performance is satisfactory; profession level: $a_{12} = \frac{4}{17}, b_{12} = \frac{11}{17}, c_{12} = \frac{2}{17}, d_{12} = 0,$ and $a_{12} > d_{12}$, $a_{12} < b_{12}$ , $b_{12} > c_{12}, c_{12} > d_{12}$ , it belongs to the micro potential level 15, already is on the verge of satisfaction; foreign language level: $a_{13} = \frac{2}{17}, b_{13} = \frac{8}{17}, c_{13} = \frac{5}{17}, d_{13} = \frac{2}{17},$ and $a_{13} = d_{13}$, $a_{13} < b_{13}, b_{13} > c_{13}, c_{13} > d_{13}$ , it belongs to the weak balance level 26, satisfied and unsatisfied reached a state of "close", if students do not pay attention to the improvement of foreign language level, it is likely to cannot meet the needs of the unit.

(2)The analysis for the biological college' satisfaction

Job performance: $a_{21} = \frac{16}{17}, b_{21} = \frac{1}{17}, c_{21} = d_{21} = 0,$ and $a_{21} > d_{21}, a_{21} > b_{21}$, $b_{21} > c_{21}, c_{21} = d_{21}$ , it belongs to the micro potential level 2, it is in the same situation with commercial college and overall graduates. If they make a little effort will get unit leadership more valued and appreciated; profession level: $a_{22} = \frac{9}{17}, b_{22} = \frac{5}{17}, c_{22} = \frac{3}{17}, d_{22} = 0,$ and $a_{22} > d_{22}, a_{22} > b_{22}, b_{22} > c_{22}, c_{22} > d_{22}$ , it belongs to the micro potential level 3. Compared with the job performance, it is a bit poor. But it is satisfactory overall; foreign language level: $a_{23} = \frac{4}{17}, b_{23} = \frac{7}{17}, c_{23} = \frac{6}{17}, d_{23} = 0,$ and $a_{23} > d_{23}, a_{23} < b_{23}, b_{23} > c_{23}, c_{23} > d_{23}$, belongs to the micro potential level 15. It is also nearly the edge of the satisfaction.

(3)The analysis for the medical college' satisfaction

Job performance: $a_{31} = 1,$ it belongs to the associate with the potential, it shows that society is satisfied with medical college students' job performance very much; profession performance: $a_{32} = \frac{8}{14}, b_{32} = \frac{6}{14}, c_{32} = d_{32} = 0,$ and $a_{32} > d_{32}, a_{32} > b_{32}, b_{32} > c_{32}, c_{32} = d_{32}$ , it belongs to the strong potential level 2, it is also very satisfactory to society; Compared to other college graduates, their nature of work is very special. Job performance and profession level is the key to obtain patient trust, and also a standard to measure whether a doctor is qualified. The most worrying is that foreign language level : $a_{33} = 0, b_{33} = \frac{6}{14}, c_{33} = d_{33} = \frac{4}{14},$ and $a_{33} < d_{33}, a_{33} < b_{33}$ $, b_{33} > c_{33}, c_{33} = d_{33}$ , it belongs to the strong against the potential level 42, it shows that the society is very dissatisfied with their foreign language level. Analysis of the resulting data

Tab.4.

Table 4. Resulting Data Table

| | $a+bi+cj+dk$ | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Commercial college | Situation sequence | Biological college | Situation sequence | Medical college | Situation sequence | Overall graduate | Situation sequence |
| Job performance | a>d,a>b, b>c,c=d | 2 | a>d,a>b, b>c,c=d | 2 | a=1 | 1 | a>d,a>b, b>c,c=d | 2 |
| Profession level | a>d,a<b, b>c,c>d | 15 | a>d,a>b, b>c,c>d | 3 | a>d,a>b, b>c,c=d | 2 | a>d,a<b, b>c,c>d | 15 |
| Foreign language level | a=d,a<b, b>c,c>d | 26 | a>d,a<b, b>c,c>d | 15 | a<d,a<b, b>c,c=d | 42 | a>d,a<b, b>c,c>d | 15 |

## 4. CONCLUSIONS

We put four-element contact number and posture ordering of set pair analysis in the application of the satisfaction of the university graduates for society situation analysis. Each index of the situation level objectively reflects the problems of the university graduates, also makes the macro we see the quality of the graduates, we hope this satisfaction analysis has certain reference significance for the future.

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# Analysis on the Connotation and Imaginal Growing Points of Rubber-band Skipping Ballads

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Abstract: The thesis, interprets the connotation and denotation of rubber-band skipping ballads, which is an integration of folk sports and local cultures with unique characteristics, through deconstruction of their classifications .Then, it analyzes the current growing points of their images, which makes a significant contribution to inheriting rubber-band skipping and corresponding ballads, as well as enriching Chinese folk physical culture.

Key Words: rubber- band skipping; ballad; connotation and denotation; image

## 1 INTRODUCTION

Production of ballads is very agelong. In the early Xia and Shang Dynasties, ancestors have creating the Song of Throwing Clod which sings " Sunrise to be out, Sunset to be in... " . " The Book of Songs which divided into Feng, Ya and Song three parts, collect 305 poetries and songs during about 500 years from early years of Xizhou Dynasty to middle of the Spring and Autumn Period " [1-3]. The Feng represents folk rhyme. The researches of later scholars showed that the ballads reflect the highest thoughts and art value of the Book of Songs of which would sing " The hunger unger sings for the food and the labor sings for the happening... " [2]. Such as Fa Tan, Shuo Shu are also the masterpiece of the Feng. After Spring and Autumn Period, with the continuing of society it gives kinds of ballads what engrave marks of that era during the different historical period, rubber-band skipping ballads are one kind of them. According to the investigation conclusion, the game, rubber-band skipping produced in Peking in the middle of twenty century. With the extensive spread of this game in folk, the rubber-band skipping ballads which matching to this game are also born and spreader extensively in folk in the 1980s.However, what's the connotation and denotation of rubber-band skipping ballads? What are its current growing points of their images? These problems are so worthy to think and discuss, then, begin with the classification of the rubber-band skipping ballads, we are going to dissect its rich and varies connotation.

## 2 Classification of rubber and skipping ballads

The children's songs can be divided into game songs and educated songs by its function [3] or according to their generation time separated into ancient nursery rhymes and current children's songs or divided into Chinese nursery rhymes and Cantonese nursery rhymes by its language and so on.

According to rubber-band skipping ballads which were collected by us, they are not only have general characters such as entertainment, expression and heuristic teaching etc, but also have specific characters like describing characters, description of society and nature, so, we put rubber-band skipping ballads into four styles that are ballads about knowledge, ballads about spiritual life and material life, ballads about figure, ballads about education, as Table 1.

Table 1: classification of rubber-band skipping ballads

| Styles | Examples | Connotation | Function |
|---|---|---|---|
| Ballads about knowledge | Little ball, let's play and kick. Kick zero to twenty-one, kick twenty-one to twenty-five-six, kick to twenty-five-seven, kick twenty-eight and twenty-nine to thirty-one……<br>Big rooster, so beautiful, who has deep red comb and colorful feather, who has shining and golden foot, is the most beautiful one of all roosters.<br>I'm a little frog, I'm a little frog, I always open my mouth and croak. Please don't fell me tiresome, because I catch pests by doing this. | Reflect the cognition of nature and society. | Entertaining, Imparting knowledge. |
| Ballads about spiritual life and material life | Small sickle, cutting grass, but my young sister still sleeps at home……<br>The wind is blowing the leaves, my sister and I go to pick flowers, sister has picked star anise and I picked a Malian flower. | Reflect the varies activities of human beings and their life. | Entertaining, life Practicing. |

| | | | |
|---|---|---|---|
| ballads about figure | Twinkle little star, I scan Peking at bridge, I can see the Tian An Men。Hurrah, Chair Mao is the people's liberating star.<br>Li Xiangyang, our revolutionary model, is never surrender to enemy. If the enemy comes to catch me, I will try my best to jump up the wall and over it.<br>3. Monk Tang is riding horse; the Monkey is following after him. The Monkey runs fast, the Pigsy is following after him…… | Reflect the qualities and characters of varieties of figures. | Entertaining, comprehending characters |
| Ballads about education | Little Ling was having class, the teacher was teaching while she was sleeping, the contents went in one ear and out the other---Dose it so funny?<br>A red flower is more and redder, Liu Hulan is people's heroine who was "a great life, a glorious death". | Reflect the instruction of morality and knowledge. | Entertaining, moral educating. |

## 2 The connotation and denotation of rubber-band skipping ballads

The connotation and denotation are emotion, cognition and thoughts about the masterpiece or the things. The implication of rubber-band skipping ballads is also manifested in the emotion, cognition and thoughts of the ballads.

### 2.1 Connotation and denotation of ballads about knowledge

### 2.1.1 Express the cognition of humane knowledge

Humane knowledge is the accumulation of the history. There are many kinds of forms for human to express the cognition for the humane knowledge in different historical period, for a instance, write it into songs and it's the most usual way of all. The songs can not only keep the culture of that time but also inherit the humane knowledge that same as the rubber-band skipping ballads.

In the sight of longitudinal, the ballads of rubber-band skipping have went through three parts of our nation that are the period of Liberation, the period of Reform and Opening-up, the period of Developing Socialist Modernization. From the transversal perspective, the contents of the rubber-band skipping ballads refer to aesthetics, art, and history and so on.

The first period is the Liberation of our nation; the ballads reflect the cognition of aesthetics and history. There were lots of activities about supporting the Socialist and rectifying the state order as materials for rubber-band skipping ballads. For example, "Big rooster, so beautiful, who has deep red comb and colorful feather, who has shining and golden foot, is the most beautiful one of all roosters."---this ballad produced in the period of Liberation when the Land Reform was in process. Songwriter put the rooster, common at farm, as the song's subject, not only caught characteristic of cock's crow but also indicated industrious spirit of farmers. And it is vivid and visual to children for knowing the look of a rooster by its color and shape. For another example, "I play rubber-band skipping, I know the Movement against Three Evils, against corruption, against waste, against bureaucracy."---the subject of this ballad even is the Movement Against Three Evils which belongs to knowledge of history, reflected the profound historical implication. The second period is Reform and Opening-up, the ballads reflect cognition of people's art knowledge. As the reforming and opening to the world, a large number of HK and Taiwan dramas inflexed mainland, therefore, there were many alternative materials for nursery rhyme. For a instance, the ballads which according to The Princess Pearl--- "swallow fly, swallow fly, prince Ⅴ run, prince Ⅴ run. Chien-lung loved the Concubine Ling, nobody love tenderly Jinsuo......", according to The Thirteen Sister " thirteen sister, loves Longfei, Longfei, loves Ziwei......", according to The Legend of the Condor Heroes" the candid Guojing married Huangrong, Zhou Botong like a Cheshire cat, the seventh old man of Hong loved drinking wine, sneaky Mei Chaofeng....."and so on. The three songs embodies the connotation and denotation that civilians no longer engage in labour wholeheartedly but gradually began pay close attention to the art knowledge. The third period is Developing Socialist Modernization, reflects the cognition of people's knowledge of sinology. With the developing of education, the rubber-band skipping ballads reflect people's cognition of humane knowledge was up to the higher level. The writers of ballads put the sinology into the ballads expressed cognition and respect. Such as "The white sun sets behind mountains, The Yellow River flows into the sea. Go further up one flight of stairs, And you'll widen your view a thousand li.", "At a wall corner some plum trees grow; Alone against cold white blossoms blow. Aloof one knows they aren't the snow, As faint through air soft fragrances flow." were used Mounting the Stork Tower written by Wangzhihuan and Plum Blossoms by Wang Anshi as the main contents of ballads.

### 2.1.2 Express the cognition of natural knowledge

The nature of children means material world that different from society of human. Children know the world at first by natural things. When they growing, they would sing the nature what they think into the ballads. There are these contents in rubber-band skipping ballads which express the cognition of nature knowledge.

Such as” dot, dot, dot the apricot flower, apricot flower fade, and eat snake melons. Dot, dot, dot the peach blossom, peach blossom fade, and eat melons. Dot, dot lotus, gain lotus-root, eat watermelon. Dot, dot, dot the plum blossom, gain snowy, eat sugar melon.” described different flowers and melons to express the connotation of different seasons have different habits of life. Another example like “I’m a little frog, I’m a little frog, I always open my mouth and croak. Please don’t fell me tiresome, because I catch pests by doing this.” This rhyme according to personate frogs to express the cognition of frogs is beneficial insect

2.2 Connotation and denotation of ballads about spiritual life and material life

Ballads about life are the songs which are based on our material life and spiritual life, express some emotion. It reflects the society and local customs of a certain age, people's thoughts, emotion and life of a certain class [3]. These kind of rubber-band skipping ballads express connotation and denotation mainly focus on two aspects.

On the one hand, it reflects the real life. For example, ' small sickle cutting grass, little sister sleeping at home ' expresses our wishes to help parents work through children's real life. 'The leaves crashing, my sister and I gathering flowers, she got a star anise and I picked one Malianhua... 'shows us a picture that children have fun in the wild life. 'Snowing, snowing, the earth covering with snow, little sister falling down, and a snow doll coming to the ground. Little sister calling mummy, coming quickly coming soon. 'Shows us the family having fun in snow. On the other hand, it reflects the spiritual life. In different historical period, people have different spiritual life. As a result, the rubber-band skipping ballads also express different emotions. In the early 1950s, rubber-band skipping ballads express emotions mainly focusing on two aspects. One side, it expresses the emotion of admiring and praising national leaders. Like “‘Chairman Mao's glory, gala yaxi nono. Shining in the Snow Mountains, yila qamba Nono...." This ballad is partly taken from the song Chairman Mao's Glory and expresses great admiration, praise, love, gratitude implication to the great leader. On the other side, it expresses people's hopes for a better future. Such as "rubbers around feet, jump and jump. Like geese, like little birds, jump low and jump high. Skipping mountain, skipping sea, finally skipping to Taiwan. See families, little fellows, rubber band skipping with laughter ", this song was written in the late seventies of the last century, which shows the good wish for reunifying our motherland.

2.3 Connotation and denotation of ballads about human

2.3.1 Express the cognition of historical figures

In the long history of China, there were so many famous historical figures. Among these people, the most influential ones are heroes and disgrace ones.

It is mainly embodied in two aspects. On the one hand, it expresses our admiration of heroes. Such as “stars shining in the sky. I watch the Beijing on the bridge, I see Tiananmen Square and Chairman Mao is our hero"; " Red flower is red, Liu Hulan is a heroine, she was a good child in her childhood, became a heroine when she grew up..." They show our admiration to Chairman Mao and heroine Liu Hulan. On the other hand, it expresses the emotion of our denunciation of scums. Such as"Lin Biao argued with Ye Qun, Ye Qun said: do not blame me, you should blame your son Lin Liguo, Lin Liguo drove the plane, fired and killed a flock of hens, hens laid eggs, all the people came and saw what would he do, while, I think he should be criticized" is easy to understand though it doesn't have strong logic. It conveys that people hate Lin Biao for his damage behavior to our nation during the Great Culture Revolution. "Zhou Bapi, Zhou Bapi's wife is in Hangzhou, Hangzhou is going to be liberated, Zhou Bapi's wife buy a ice-lolly, but ice-lolly melt into water and Zhou Bapi's wife become a ghost" expresses that people hate landlord such as "Zhou Bapi".

2.3.2 Express the cognition of artistic characters

The artistic characters are created by romance and fiction that based on historical facts. Rubber-band skipping ballads express the cognition of artistic characters by describing artistic characters .

For example, the ballad "snake monster Bai Suzhen, came to gratitude to Xu Xian. But she met the old monk, who put her into the Lei Feng Tower. Her son Xu Shilin had a selection test and was the champion, finally, he rescued his mother " is based on White Snake, extolling the soul-stirring love story as well as praising artistic characters like Bai Suzhen, her husband and their son Xu Shilin. Another ballad "Tang Seng horsing tok tok tok, followed by Sun Wukong, Sun Wukong running fast, followed by Zhu Bajie... " is based on the fiction Journey to the West . It's humorous and popular among children. It also expresses people's cognition of the characters from Journey to the West.

2.4 Connotation and denotation of ballads about education

Education means a progress of teaching, training and learning, especially in schools or colleges, to improve knowledge, cultivate character, and develop skills and intellectual and physical activity. The educational significance on skipping ballads is embodied in teaching kids to form good study and living habits as well as cultivate good moral quality.

"Little Lingling goes to school, the teacher's lecturing, she sleeps, so she acquires nothing, isn't it a joke?" This ballad describes a little girl who doesn’t listen to her teacher in class. The question "isn't it a joke?" warns that children should listen carefully in class and develop good study habits. "The 8th Company on Nanjing Road, a pair of pants they can wear for nine years, in the first three years, it was new, in the mid three years, it was old, and then sew up for another three years", "sky going to be house and earth is bed, potherb is food, the Red Army do not afraid of hardship nor tired, they stand on a high mountain". These two ballads are going to tell kids work hard and save by decrypting the good company.

## 3 GROWING POINTS OF THE IMAGES OF NEW RUBBER-BAND SKIPPING BALLADS

If we use the objective things to express the subjective emotion, we can call it image. On the one hand, with the development of history and society, the image of rubber-band skipping ballads is also changing with the changes of social rules. On the other hand, skipping ballads are created along with social development, only when the creators have true feelings on the social development of new objective image, can new ballads be created. Nowadays, the born place of moral image mainly focuses on the following four aspects.

### 3.1 Growing points of the images of new rubber-band skipping ballads about knowledge

### 3.1.1 Growing points of the images about humanistic knowledge

Humanistic knowledge means the basic knowledge about humanity (mainly in spiritual life). It shows the "people-oriented" thinking, caring people and respecting the spirit of people. It mainly includes history, politics, art, philosophy, religion, moral and other knowledge [3].

Born places of the image about humanistic knowledge mainly center upon the current history, politics, art, ethics and other aspects. As the historical knowledge of humanities, the ballad " China is great, China is big, China is taking off and surprising the world, people is great, everyone praise the scientific and technological innovation " based on themes like "Touching China", "Top Ten Scientific and Technological Innovation Characters" .As political knowledge of the humanities, recent ballad" rubber-band, I can skip, I know anti-corruption and advocating honest and clean, no corruption, no bribery, punishing corruption with no regret " presents the spirit of "Scientific Development View", "Anti-corruption" and " Mass Entrepreneurship and Innovation ". As moral knowledge, "Nice Ten Rural Female Teachers", "National Moral Models" may be the growing points of images for ballad "there is a female teacher, who's so beautiful, with long hair and colorful coat, teach me singing and drawing, I am the champion on study. "

### 3.1.2 Growing points of the images about natural knowledge

Little kids are full of curiosity to explore the nature. Natural knowledge in their mind might be those plants, animals or other variety of objects that they can see or contact through daily life, TV or network media.

Therefore, growing points of the images about natural knowledge are mainly embodied in varieties of plants and animals, or other physical images that exposed to kids in their daily life. "I feed a Persian cat, it has blue eyes, white hair, when see me, meow, meow, meow" is created by the inspiration of daily animals. As natural images, desiring for good weather and environment is the born places of images, the ballad "it's windy, and it's raining, it's fine after the rain. Haze disappeared, and the sun is smiling" is created. This kind of ballad can not only teach kids to know more about the nature, but help us get more familiar with nature by playing games.

### 3.2 Growing points of the images of new rubber-band skipping ballads about living life

### 3.2.1 Growing points of the images about real life

Ballads record and reflect public life in different historical periods since its formation. It's popular among people and singing ballads also become one of the main entertainments after working. "Dogs barking and someone came to the door. Open the door, it’s grandmother. Grandma smiling and drinking tea... Buying flour making soup, she took all in one meal." Several common activities of ordinary people show us an interesting image. Not only does it give us the true feelings but it's natural and vivid. So real life can also bring us inspiration in creating ballads.

Nowadays, growing points of the images about living life are mainly embodied in the material life. As material life, computers, well-off life, fast travel, housing conditions improvement become born places. Like "small computer is a treasure and full of knowledge. If there is a problem, go to find it, click the mouse and you'll know all ", " cars, cars, beep, beep, beep, I and parents come to Beijing, the Summer Palace, and Badaling, also visited the Palace Museum and Wangfujing ", " residential buildings is high, I can see cloud on my balcony, stars blinking on me, and the moon is laughing. " These real life scenes are also one of the most important and main growing points.

### 3.2.2 Growing points of mental life

With the development of our society, our mental life has changed from driving the invaders out of our homeland during the Anti-Janpan War period to having enough food to eat and having enough clothes to wear and getting rid of poverty and becoming better off. Eventually Chinese has realized the Chinese dream of national revival.

Of course, the children’s mental life can be shown mainly in many aspects of conventional mental life, such as cultivating cozy family love, deep kindness, noble virtue and hard-working and thrifty style of work .However, the contemporary rubber-band skipping ballad reflects the international growth point of mental life, the most popular aspect is the Chinese dream of realizing national revival. For example, we can compose like this, Chinese dream, Positive energy and hard study can achieve your dream. The chairman Xi and The premier Li will lead us to a well-off society.

### 3.3 Growing points of the images of new rubber-band skipping ballads about human

#### 3.3.1 Growing points of the images of real figures

The ballads like poetry, poetry's essence lie in lyric and that of ballads lies in lyric or ridicule or no sense. The genre like ballads are not always portrays character images and that same as the rubber-band skipping ballads. Therefore, there are not many images of real figure as the contents of the ballad. However, writers of ballads would also compile the comments of somebody from the public into the ballads to enrich contents of the ballads, and even use the comments straightly as the ballads to teach to children.

Nowadays, in the reform and opening up as significant characteristics of the times, in order to achieve the great rejuvenation of the Chinese dream for the goal of the context of the times, the new growing points of rubber-band skipping ballads mainly in order to carry forward the national spirit carry forward the fine traditions of spiritual aspirations. For example, according to current "the most beautiful mother", "the honest brother", "Chinese courageous good list" and so on, we can incite like "The most beautiful mother is 28 years old, love baby dearly and all people boast, not afraid of bitter, not afraid of tired, we always miss her.", like "courageous hero Guo Wenbin, grabbed criminals even give up life. Criminals always do bad things, they are not a good thing."

#### 3.3.2 Growing points of the images of art character

The difference between art characters and real figures is that the art characters are more vivid. As the images of rubber-band skipping ballads, the art characters can cultivate more imagination and creation of children. Like "one, one, one brother Hugh, why do you call me one brother Hugh, because I would sing folk songs, so please call me one brother Hugh. "And "Small, small, small Swallow, why we call you swallows, because I would comb pigtail, so call me swallow."---these were according to the famous cartoon in the 1980s which name is the Smart One Brother Hugh and the popular song which name is the Little Swallow. This kind of ballads is compiled by the simple, active and interesting characters of art that are ideal rhyme for children to sing.

At present, growing points of the ballads images of art characters are also reflect in the popular art works. Like the One Piece, the Naruto and the Boying Ghost·Dawn Record as the parts of current famous cartoons, the characters in them can be the growing points of rubber-band skipping ballads. We can sing "o, o, one Piece, we all love to watch One Piece, , group of nine, with the help of pirates, Straw Hat Luffy can lead them.", sing "naruto naruto every day chase, Sasuke Sakura are diffcult to chase. Kay sit tortoise, Mike could not drunk, Kimimaro to be dying, Naruto drag after them.", and sing "Hakuoki, thin cherry ghost, Hakuoki are nice and kind. Ryunosuke, Ryusuke, the fearless warrior can be perseverance. Teenage Dream have more obstacles, overcome darkness bravely and greet dawn happily." .Although these ballads have wrong order on their logic; they just can meet the funny and illogical of children's character. They are adorable for children. Then, as far as the perspective of adding children's life funny and cultivating children's creation, the images of current art characters could be well suitable growing points of rubber-band skipping ballads.

### 3.4 Growing points of the images of ballads about education

The educational significance on skipping ballads is embodied in cognition to essential knowledge, acceptance for moral and ethic and cultivation of good habits of life and study. Like "Zhou Bapi, who stolen the chicken......"just put the deeds of Zhou and his wife's final result as images of the ballads, to teach children can not steal things." Little Lingling goes to school, the teacher's lecturing, she sleeps, so she acquires nothing, isn't it a joke?" has the function of helping kids cultivate good habits of study and life. These days, our national cultivation of kids have disadvantages of attach importance to intelligence and ignore foster emotion, it leads current kids are very clever but no enough moral qualities and humane emotion even leads them become greedy and selfish, and the spirits of helpful, distress the poor, kind to people are gradually faded, this situation make people cannot help but care and worry. Therefore, nowadays growing points of ballads should enhance education for children's moral emotion which focuses on foster emotion of family and society. Years later, parents gain old, the elderly and infirm should be care.", "food we eat, raw from grain, farmers hard farming to get. Respect labor, always be frugal. I would not throw leftovers", this kind of ballads are moral and emotion education through actively games, it's not only good for children's healthy growth but also help to train nice quality personnel.

## 4 CONCLUSIONS

Rubber-band skipping is one of the children's favorite game and it become popular all around the world in a very short time since it was burned. The powerful vitality and fascination has a close relation to the children's game and composition. Hitherto, as a cultural phenomenon, whose intention refers to personal anecdote, family funny story, state affairs, world affairs, natural common sense, humanistic knowledge and virtual mentality .whose connotation concludes the cognition of knowledge, praise of life, extolment or abhorrence of figures. The reason why it mesa a lot to children and becomes one of their favorite games is that rubber-band skipping has abundant images and connotations. Till now, rubber-band skipping is not popular and no longer can be seen here and there. We study the connotation and intentional growth point of rubber-band skipping, aiming at digging its abundant connotation, highlighting the character of nation culture [2], showing its positive meaning and appealing to our concern and transmission.

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# Study on the Influence of Montessori Educational Theory on the Physical Education in Chinese Schools

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Abstract: Maria Montessori is an Italian educator famous for preschool education thought and education method. Studies on her works propose that her thought of physical education consists of the view of free exercise, the physical and mental development view of exercise and the view of "targeted" game. Its spread and influence on school physical education in China are mainly through newspapers and books, and along with the progress of science and technology, it has a diversified development trend.

Keywords: Montessori, educational theory, school physical education, influence

## 1 INTRODUCTION

### 1.1 View of Free Exercise

Montessori says that "free" is the unshakable basis of the education system that we advocate, and also is a kind of popularizing law of education.[1] Thus, we propose a simple suggestion: let children live in an environment in which the size of everything matches their sizes, to enable them to develop their inherent "positive life" freely. "Physical education should abandon the rigid system in the past, and no longer restrain individual sports. It should allow children's normal development of their own energy, and should support the children to play the role of sports more effectively", and "the basic principle of scientific education is the principle of students' freedom, which allows personality development, and spontaneous performance of children's nature". [1] She says, that "children need exercise" has become a health principle widely accepted. Therefore, when we talk about "free children", we generally refer to that they can exercise freely and are able to run and jump freely.[2] "If children have no 'intelligence goals' in sports and are lack of guidance, the exercise will make them bored. One of the cruelest punishments invented to publish prisoners is to force them to dig a deep pit in the ground, and then tell them to fill the pit up. That is to make their work have no goal". [2]

### 1.2 Exercise—Physical and Mental Development View

Montessori says, "today's biggest mistake is thinking the issue of sport in isolation, as if it has nothing to do with mental function. We treat the muscle as an organ used merely for healthy body. We exercise or do gymnastics, to keep fit, breathe well, eat happily and sleep comfortably. However, it seems that a great monarch becomes a servant. The monarch, muscle system, just plays a promoting role of life". [3] "For the essence of exercise, especially in the childhood, our understanding is biased, and many wrong ideas make us underestimate the importance of exercise. School gives priority to intelligence, while exercise, as a part of school life, has not been taken seriously. Even if there are sports courses, they are only known as "practice", "sports" or "game". The close relation between exercise and mental development is ignored". [3] She thinks that exercise always accompanies all the body activities. The children get the all-round development of both body and mind through exercise. Exercise is good for health, and can also inspire courage and self-confidence, so its effect on mentality is indispensable.

### 1.3 View of "Targeted" Game

For game, Montessori says, "today's biggest mistake is thinking the issue of sport in isolation, which breaks the link between exercise and thought and can only lead to evil consequence. Because children have both body and mentality, we must set game courses for children to develop their physical and mental ability". [3] She says, "if we don't utilize our mind, it would stop thinking or even becomes aging. There are many good ways to exercise the brain, and children's game is one of them. As long as the mother gives a little hint, even a simple game can become a tool to improve the brains".

## 2. The Spread and Influence of Montessori Educational Theory in China

The introduction of Montessori educational theory into China dates back to the early 20th century. Its spread and influence in China are mainly through newspapers and books at first, and then along with the progress of science and technology, media and academic exchanges provide more convenient ways for the spread. Although Chinese scholars' studies on the spread of Montessori educational thoughts are not very much, their studies are meticulous. For example, Liu YangHui thinks "the introduction of Montessori preschool education thought in China mainly relies on newspapers and books, for their propagation speed is faster and spread surface is also wide. Tian Zhengping thinks, "when Montessori educational thought is introduced into China and through what channels at first are still uncertain in academia at present. In September 1922, Chang Naide's paper

"Elementary Education Methodology of Montessori" published in The Education Magazine, proposes that the introduction of Montessori theory in domestic academic circles "appeared still fourteen or fifteen years ago". According to this statement, it can be inferred that the introduction should be around 1908.[4] And seen from the retrieved results of existing research, Chinese scholars' studies on Montessori educational thought are relatively common, while the discussions on its game ideas are less, and studies on sports are even less. Through reading Montessori writings, and referring to relevant literature, we can get that the study and refining of Montessori sports thought are conducive to developing the thought of physical education, and can provide methodological guidance for sports teachers and sports managers. Through the study on the documents of Montessori sports and games, we can draw the following conclusions. First, in the research in this field (except for the papers specializing in the study of game thought), scholars generally apply some theories to explain or analyze one aspect of the problem, but have not conducted deep exploration or conducted more thinking on its theory in sports and games. But there is no denying that Montessori educational theory is recognized and respected by many scholars in the education community of China, and its emphasis on sports is worth deep thinking of China's sports education circle; second, the free education emphasized by Montessori education method plays a promoting role in the physical and mental development of children; third, I find that Chinese scholars' understanding on Montessori education is different, which remains to be further discussed. They basically have the following two views: one view is that "work" referred by Montessori is not equal to "game"; another view is that "work" referred by Montessori is basically equal to "game". Finally, although Chinese scholars generally support Montessori education thought, there are still some scholars mention its shortcomings, for example, Wang Hailan thinks "based on the identification of 'positive education', children's education content put forward by Montessori is very rich, such as sensory training, manual labor, reading and writing, introduction to arithmetic, gymnastics, etc., and the concrete methods are also put forward. But the content is basically intellectual education, while the development of games, interests and imagination is ignored".[5]

## 3. The Reference and Enlightenment of Montessori Educational Theory for the Future Development of School Sports in China

### 3.1 Using the Concept of "Free Exercise" to Promote the Formation of Students' Personality

Montessori's view of "free exercise" mainly includes four aspects: first, freedom is the foundation of scientific education; second, physical education should give students free exercise; third, students' free exercise should be developed in a suitable environment; fourth, free exercise not only includes physical freedom, and the intellectual purpose should also be clarified to develop students' individuality; thus, the aim of Montessori's view of "free exercise" is to cultivate and develop students' individuality through the form of "free exercise". But the "free" here is not equivalent to "random", "in the appropriate environment" she mentioned actually has given an "adjective" to "free exercise". Meanwhile, she thinks "providing a place for children's free life is conducive to children's self-discipline and self-development, which is an important condition of personality formation. Although, these practices are not essential exercises for them, nor are for a certain interest, they are an important factor to form harmonious and complex personality. A child's social consciousness will be formed in the relationship established jointly by him/her and other children. His/her "partner" is the kind of household design protecting and helping his/her growth; children obtain high consciousness in the learning of satisfying themselves and in the environment of protecting and controlling themselves, — these are people's cofactors accompanying "free exercise". Children get the impulse of sticking to fulfill their missions in the development of this individualistic consciousness, and show the impulse of rational joy in the process of conscientiously accomplishing of the missions".[1]

Above all, I think that in physical education, the application of the thought of "free exercise" is necessary. In terms of the thought, it has two aspects. The first aspect is the freedom of education (or students exercise) form, that is, if students have no freedom of the most basic exercise form in physical education class, the freedom of deeper levels is nonsense. Physical education class is greatly different from other courses in the aspect of form and its main form is physical activity, so the so-called "silence" appearing in the sports class is undoubtedly a failure. The second aspect is the freedom of thought, which is to develop the students' personality while making students not feel tired in physical education learning along with targeted movement of intelligence. The purpose of school physical education is not only to make students exercise, for the more important purpose is the serial effect brought by students' exercise. But if students have not conducted exercise, then the other goals will not be achieved. Therefore, in the sports teaching, we should first let the student exercise freely, and to achieve the goal of deeper layer on this basis and through long-term struggle is the direction of school sports in China.

### 3.2 Physical Education of Body and Mentality Exercises

Montessori believes that the promotion for good health is the most basic function of exercise. Montessori education works mention that current people generally have a misunderstanding more than once, that is, ignoring the beneficial effects of exercise on the intelligence and mentality, and unilaterally accepting the positive influence of exercise on the body. It can be observed that Montessori's understanding on exercise is not constrained to the surface. In terms of school sports education, can scholars and teachers engaging in the sports teaching understand this? Have they made every physical education class be beneficial for students' physical and mental development? Seen from the objective evaluation on the present situation of school sports in China, the positive impact on both body and mind has gained widespread attention and recognition. However, in the actual teaching, the ignorance on this problem still exists generally, that is to say, many people have realized this problem, but their action is far behind the thought. Therefore, as a problem has not been solved, the mere realizing does not mean problem disappearing. Secondly, from two dimensions of body and mentality exercises, the problems in the aspect of body exercise in school sports of China have not yet been solved in recent years, such as the phenomenon of continuous decline of students' scores in physical test, etc.; the cycle required by body exercise is definitely much longer than the cycle required by mentality exercise, and the long cycle is one reason why the effect of mentality exercise in physical education class is unobvious, but the primary cause is that not all teacher emphasize it.

### 3.3 Skillfully Applying "Game" into Sports Teaching

The "game thought" in Montessori educational theory has two aspects. One is targeted "game". She criticizes the game and exercise without target and supports targeted game. Second, "game", as one of teaching means, is highly desirable. The physical education reform in China has been conducted for more than 10 years, but the once popular concept of "happy sports" greatly reduces the quality of physical education in the actual teaching, for many teachers misunderstand the meaning of "happy". Similarly, while referring to "game", the first reflection of most people is the happy scene of the game, but the game not simply means laughing happily, and the game of higher level has profound philosophy and educational significance to the players. Therefore, we can "skillfully" apply "game", to make it have a purpose and make it become a medium to develop students, which are exactly the real meaning and essence of Montessori educational thought.

## 4 Conclusion

It can be observed from the study that although Montessori educational thought appeared centuries ago, its value is beyond reproach nowadays. Its numerous ways of early childhood education as well as the understanding on exercise, the relationship between exercise and body and mind and the game are worth further thinking of teachers engaging in sports research and teaching. Although the introduction of the thought into sports teaching has positive effects, we should consider that whether the ways fit for infants are also suitable for teenagers and physical education. Having objective attitude and adhering to dialectical reference are necessary academic research attitude, and also the motto of physical education teachers.

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# Application of the Internet to Assist English Learning -- An Investigation to the Students of 2006 in Sports and Art College of Tianjin Sports University

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Abstract:With the development of computer technology, the popularity and application based on Internet are developing fast. Network has become one of the main ways for college students to learn about information, gather information, and acquire knowledge. Due to professional differences, personality differences, learning atmosphere and other factors, the new way of learning English of college students with the support of network resources approach of the different effects and results.The main propose of this essay is to know the different problems which college students study English occur when they apply the network resource. In present , almost all of the students'spare time occupied by the Internet , most of them like to download the learning resources from network. The new mode of learning has stimulated the initiative of university students learning English, at the same time has tested the ability for individual learning and self-control. Actually, it also brings about several of problem, such as the poor self-control capability when it faces to the influx of different information.The thesis will show the current situation of the college student apply the network recourse to learn English of 2006 in Sports and Art College of Tianjin Sports University by giving an investigation. And it is helpful for college students to make the best use of network resource, and help learners to improve their ability of learning English.

Index Terms**:**network recourse; independence of leaning; learning efficiency

## 1. INTRODUCTION

With The Development of the globalized world, English as an important communication tool to communicate with the world, college students pay more attention to enhance their ability of emphasis and application in English. With the advances in electronic information age, network technology continuously updated, Internet resources greatly enriched. The content of network resource is rich and varied. What's more, it broke the restriction of time and space. For example, various network teaching platforms as Learning Space, Web CT, Top Class, Black Board, Grove, and various interactive tools as E-mail, BBS, Chat room, Video conference, Blog, Wiki, and so on. Therefore, more and more college students chose making advance through the network resource.

Self-study is of paramount importance in college learning life. During the present time, new ones replaced the older generations of information and knowledge. Network English learning is to become a mew learning style. Diverse learning resources, content and information are opening up, so learners can share it's simultaneously. It greatly broadens the way that the students how to gain knowledge. Besides, it provides an effective platform for learners to study. It creates a condition to enhance student's ability of self-learning and excite their imitative of learning English. But the Information as much as the seawater and network traps exist anywhere .Students must have a strong requirement to find the information, the ability to absorb and apply. In order to make the learning efficiency turns highly.

Doing research on the apply internet resource to assist English learning of the students of 2006 in Sports and Art College of Tianjin Sports University towards English learning by internet resource has the practiced meaning ,at the same time towards the English teaching varies the basic theories in implementing the network course.

## 2. THE DEFINITION OF NETWORK RESOURCE

The network resource mean that a kind of information resources. The information resources are spread by Communication equipment and managed by Network software with support of computer system.

Contents of the network information resource are extremely rich. Regardless of the date or the software, you can share it immediately. But the whole distribution of the network resource is chaotic. The network resources is an order in some partial scope, but the whole distribution is dispersible, the disorder, even assumes the chaotic condition. Network is a giant dynamic system. Not only the information disperser disorder, also are the changes frequently. The release of network resources makes the sharer without the limitation from time and space. It has the effectiveness strongly.

## 3. THE ANALYSIS OF THE PRESENT SITUATION AND THE RELEVANT

RESEARCHES

In this section, the thesis will show university students making use of the Internet resources to learning English in view of existing situation. In unison, it will irradiate the subjects of other people's researching on college students applying the Internet recourses to study English.

A. The analysis of the present situation

Many educationalists hold the viewpoint that the traditional English classroom instruction has certain limitation: The classroom time insufficient, the teacher "cramming method of teaching", the teaching material content limited, the information obsolete, student's passivity and teacher can't practice the principle of individualize instruction and so on the questions. For a long time past, it is puzzled English teaching profession continuously, also the serious influence arousing initiative of student, has affected English teaching effect. In the network information time, it developing speed is high. The network techniques and each kind of English website have provided the inexhaustible network resources for English teaching and the learning. To encourage the student fully utilize the network English resources and take exploratory learning. It wills solute the problems which exist in the traditional English teaching.

For the time beginning, the model of autonomy learning is the primary method we used study online at present. But in this way, not only do have a highly requirements to learner, but the interactive is difficult. The study affectation is not necessarily so well. Above all, the network is richly, the student is very easy not to be able to undergo the network various aspects enticement, loses the direction in this learning environment, loses the study the independency. Therefore, students take the autonomy learning while establishing a type of ideal of guiding learning in internet; at the same time formulate correlation measures. To a certain degree, the tendency of playing online entertainment but forgot learning turns.

B.The analysis of the relevant researches

It is universally acknowledged that network will form into a future tendency the study model. Its characteristic lay in can provide the rich studying resources to the learner, the forms of information expression diversification, break down barriers of space and time of tradition teaching type. It makes the college students keeping abreast of development initiatively. A great deal of scholars had the opinion that the computer technology and the network resources have the huge superiority regarding English teaching. First, the computer network technology development has provided the technical support for English study. Next, the computer network technology development has brought a revolution without the limitation in time and the space for English study. Furthermore, the study online from "wants students to study" turns to "students want to study". It is one kind of initiative study positive performance. It is a beginning of establishing the confidence to the student learning capability.

Up till the present moment, it has been widely accepted college students take advantage of network resources to learn English makes the studying and the life into a whole. It's really makes the studying melt into daily life. As a result of the student have interested in internet, use the computer to learn English then to stir the interesting of learning English. Furthermore, develop the ability to utilize English. It also promoted the relationship between teachers and students. It makes teacher have a through understanding about what are student need, the student also to be able apprehend teacher.

4. THE INVESTIGATION, THE QUESTIONNAIRE AND THE INFORMATION

A. The targets of the investigation

Regard the students who are major in all kinds of subjects in 2006 as the targets of the investigation. Taking 100 of them as the samples and it has fixed rule for sexual distinction.

B. The questionnaire and information

TABLE 1

The English learners come from a variety of majors. Giving them a blank questionnaire and the contents are like this. Now the questionnaire asked many elected questions which are representative, and summed up as following

| . Question | The most selected option | Percentage |
|---|---|---|
| Your computer proficiency is? | Less skilled | 45% |
| How much spare time do you spend in learning English in a week? | 8hours to 12hours | 42% |
| How often will you learn English on Internet in a week? | Two to four | 39% |
| How do you think yourself plan to behave in respect in time? | Do it generally | 37% |
| Do you have a study purpose before the network studies? | Sometimes | 34% |
| What reason did you make the study goal? | Make your own study at the request of teacher | 42% |
| How do you solve the difficult when you have a question? | Look for the materials from Internet or book | 39% |

| | | |
|---|---|---|
| What kind of helps do you want to get when you learning English through network? | Increase the confidence and patience to learn | 57% |
| Where did you learn from the network? | Dormitory | 41% |
| During the process of studying the network, can you review your own situation of learning? | Seldom | 32% |
| What do you think your efficiency of learning English with the help of network resource? | General | 29% |
| What respects do you think have influenced the efficiency to study English of your network? | Willpower | 66% |
| What do you chose to do when you can not concentrate on studying? | Read news and other entertainment. | 43% |
| What education resource will you choose to when you were learning English on-line? | Resources such as the film, video, etc. | 35% |
| Which are the resources that you often download from the network? | materials of the examination | 36% |
| Have you tried to have a chat in English when you surf the Internet? | Attempt | 29% |
| What's your English level present? | General | 39% |
| Which respect do you want to improve English ability? | Listening and talking | 37% |

## 5. THE ANALYSIS OF THE RESULTS AND SUGGESTIONS.

The following will expound the analysis of the questionnaire. It will conclude the problems reflected from the investigation and then line up the suggestions for college students applying with Internet recourses to learn English.

### A. The questions reflected from the questionnaire.

In the questionnaire, the author discovered the appearance of the current university student uses the network resources study English to be very common, thus it can be seen the rate of computer's using is very high in the university student daily study life.

According to Q1-Q4, it shows that the present university student computer level already achieved the daily application basic level. Each week will spend the much time application network resources study English, but has not fostered the good habit of planning time reasonable.

Q17 to Q18 show that the most of students in 2006 disaffected with the aspect to English proficiency in listening and speaking. Many students want to enhance their English level, but the proficient ability of listening and speaking becoming an important obstruction. Many schoolmates unable pass the CET-Band 4 also most because the listening score is extremely low. From this reason, schoolmates try to take advancement about these two aspects ability.

Therefore, when a variety of university students study English with the help of sharing network resources, they more trend to download the language study materials with video and audio. It is easier to press close to their individual hobby and the interest. It's beneficial to inspire their enthusiasm to study English. Simultaneously, many university students pay more attention to related materials about examination for passing the level exam under the pressure of examination-oriented education system. These questions reflect from Q14 to15.The university students have many crucial questions in the use network resources assistance English study process. Q5 to Q9 has exposed university student's shortcoming. The investigation shows that nearly 80 percent of university student study English make use of network resources will be in a relatively peaceful independent environment. Under the circumstances, they usually don't hold a positive manner to sort out to deal with problems when they have the academic questions. The independent environment makes them to retrieve the answer in the network. But if nobody can explain the question, it will be ignored and finally is forgotten.

Certainly, it is one reason of learning efficiency not high in network study procession. Also can be seen from Q10 to Q13, the plenty of network information content filled each kind of enticement, this causes the college students are easier attracted by objection without relation about English studying. However, the primary principle of making progress with network resources efficiently lies on students has a learning desire. Q5 and Q6 expose many university students didn't have a straightforward learning goal actually before the network study not the explicit study goal. However based on university student themselves, the clear learning goal and direction are significant intrinsic factor to excite student learning activity.

Following the facts what I said, I can draw questions that the university student in faces the rich English study materials and the tools, such as audio-visual materials, the rudiments of reading and writing, and grammar test, they do not know what course to pursued and they difficult to look for the materials suits to their own level. What's more, they always have a rough look and have a short memory. Even they could not maintain the normal network study. There are still some specific problems have yet to be solved. These phenomena speak volumes for the university students still not bring the limitless network resources into full play. It should be exploit its advantages to the full. Except the influence of learning environment and outside learning atmosphere, the subjective factor decided students whether can correct guide their behavior. Therefore, we should fundamentally fuel the positivity and imitativeness of the students, stimulate to the full the motive of study, and create a favorable atmosphere. Increasing the learning efficiency and making the full use of the network resources, consequently, study efficacy highly under the environment of high efficiency.

### B. The suggestions for college students learning English on Internet

In accordance with the questions that results of investigation reflected, I make the following recommendations for the college students apply the network information resources to learn English.

The first and most important one, on the basis of your learning content choose the valuable website. For college students, they can acquire knowledge and keep abreast of new development which is your major by the way of network information resources on your own initiative. Moreover, they also can discover the knowledge their unknown. The key here is to selects the English materials what you needs and do not to collect excessive information blindly.

The second part, draw on the experience of the learning experience from schoolmates or friends and store up the high quality website to learn English. The websites on culture teaching in college English education are gradually increased over the Internet. Internet is an international interconnect network. Learner can browse the other countries' websites. Foreign websites are the best English information resources. The kinds of English learning website is inexhaustible, information content oversized, the processes and of searching, analyzing and screening will cost a lot of time. Induces conforms to oneself level and demand English studies the website is most advantageous in enhances the efficiency.

The third one is solving the problem timely. Fully use the network interaction community forum and exchange tool. Make use of the Search Engines to look for the answer of the problem. The most convenient and fast way is taking FAQ online. May become friends with English pen pal, also may progress together in English interaction study forum with the net friend, the free discussion meets the question, pools brains and brawn the solution difficult problem. Has built the good hypothesized study atmosphere, stimulated the study initiative. Looks for the partner discuss knowledge together, progress together. Competition consciousness can stimulate us not to be able to fall behind.

The forth one is considering the personal practical situation to select the appositeness learning method. The college students can scan the foreign website. The more news and information you read the more progression you take. Similarly, you can listen the network broadcast, and then you can understand foreign cultures. Moreover, college students can take the online course. It means the distance learning. Besides, when you want to ask a question on BBS, you should describe it clearly. If you acquire the answer, you should express gratitude to respondents.

Something else, language media material is a core of the English educational resources. It's a significant resource to turn college students' learning method and arouse the enthusiasm to learn. It's also an important factor to develop college students' ability of self-directed learning, researching and cooperation. Such as several of material about college English teaching contents. The most of schoolmates consider listening and speaking is the most difficult part. According to their standard of English watch English teaching program or the television program for improving the listening ability. Trying to make foreign friends through the network, exercise capacity of oral expression. In the daily life of studying should read English article loudly as far as possible, raise the self-learning capability. What's more, accumulate the knowledge which you learn in everyday.

Last but not least, applying with the network information resources to self-learning English, the teacher should mainly focus on cultivate their learning desire. To cultivate learning interesting is means to cultivate a learning attitude. The more learning interesting become deeply, the more learning efficiency prominent. Leading college students to self-learning English with network resources is a demand of mediumistic educational way and modern society. The internet provides the diversity and abundant English recourses. Teachers should direct students to apply the network resources correctly. Making them acquaint cultures of English-Speaking countries. Thereby, they will arouse the desire and enthusiasm to gain English information and improve the ability to put to use English. At the same time, increase the ability of cultural communication.

In brief, the student themselves is the key to improve the efficiency. Then require the direction of teacher, supporting facilities of university and networking support service of country sophisticated.

## 6. CONCLUSION

With the aid of the network resources, most of the college students go on learning English. But it is discovered that there are many problems in this process of English learning. With dealing with these disturbance factors, students can be able to gain the biggest benefit from the aid of the network resources.

Not only the Internet makes the world more closely, but also does provide learners with free English learning resources. And at the same time, it creates an extremely excellent learning environment. We should take the best use of the English study resources which the network or the communication platform provides. These resources display its maximum efficiency to English learners in order to improve our learning ability and English proficiency. In this process, learners should overcome the objective factors, suppresses the harmful subjective factors. For the time being, the Google researching withdraws from the Chinese mainland market. It makes a great hider to college students to inquire about any information they need. Judging from this, China should offer the technical support and policy. Strengthening support services to ensure a favorable environment for college students self-learning apply with the network resources over the internet. Create a favorable environment for them to learning English.

The opening network platform has provided the rich study resources for the university student; stimulated the interest of students learning English greatly. In this procession, usually receives the limitation of objective factors and the influence of subjective factors. The university student when carries on the network study mostly is in the independent environment, the individual factor namely subjective factor is the most primary factor of affecting the study efficiency. Include study goal, automatic control ability, learning capability, individual psychological quality and willpower and so on. This request apply it, absorbs it effectively during the share resources.

The rich and efficiency network English resources provide the best vector for college students learning English energetic. However, self-discipline working attitude is necessary. Set up highly effective learning environment so as to promote college students' English level. Cultivating the favorable learning customer and attitude, and shaping a active and interested learning ponder. It makes students to rocking their mind to find question, thinking question, solving question. As a result, enhance their capability of learning English activity. From the enhancement of learning efficiency to structure a new model that college students have an active desire to apply network resources to learn English with efficiency.

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# Blended Learning Model Based on Mobile Intelligent Terminals

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Abstract: Blended learning has been now commonly used in corporate and higher education settings. The popularity of mobile intelligent terminals provides new ideas and methods for blended learning. This article discusses the characteristics of mobile intelligent terminals and its application to the blended learning, and puts forward a blended learning mode based on mobile intelligent terminals. Practice has proved that this blended learning model helps to improve students' learning motivation and efficiency.

Keywords: blended learning; mobile intelligent terminals; learning model

## 1. INTRODUCTION

With the development of information and network technology, blended learning becomes more and more popular. Blended learning, also known as hybrid learning, refers to the combination of a variety of new ways of learning, such as classroom learning, computer distance learning, collaborative learning and other learning methods. Overall, there exist the three most common meanings for blended learning:

1. the integration of traditional learning with web-based online approaches;
2. the combination of media and tools (e.g. textbooks) employed in e-learning environments;
3. the combination of a number of teaching and learning approaches irrespective of the technology used. [1]

With considering the roles of teachers and students, more aspects have been added to the definition blended learning, namely, "with the combination of the advantages of traditional learning and E-Learning (i.e. digital learning or networked learning), teachers guide and play a leading role in the teaching process, and the students' initiative learning, enthusiasm and creativity are but also fully embodied. "[2] In colleges and universities, in addition to traditional classroom teaching, how to make use of advanced equipment and technology to realize the blended learning became our urgent problem.

## 2. RELATED RESEARCH ON BLENDED LEARNING

Blended learning environments, involving the "blending" of face-to-face, online, print-based and other media to create an overall learning environment for students, are now commonplace in universities abroad.

American Society for Training and Development (ASTD) sees Blended Learning as the blending of five "R"s, which is applying the "right" learning technologies to match the "right" personal learning style to transfer the "right" skills to the "right" person at the "right" time. And ASTD points out the principles embedded as the following [3]:

(1) We are focusing on the learning objectives rather than the method of delivery;
(2) Many different personal learning styles need to be supported to reach broad audiences;
(3) Each of us brings different knowledge into the learning experience;
(4) In many cases, the most effective learning strategy is "just-what-I-need, just-in-time".

According to Thorne, K. blended learning offers "a real opportunity to create learning experiences that can provide the right learning at the right time and in the right place for each and every individual, not just at work, but in schools, universities and even at home. Blended Learning could become one of the most significant developments of the 21st century." [4]

Osguthorpe & Graham [5] thought the goal of using a blended approach is to"find a harmonious balance between online access to knowledge and face-to-face human interaction". They identified six reasons that one might choose to design or use a blended learning system: (1) pedagogical richness, (2) access to knowledge, (3) social interaction, (4) personal agency, (5) cost-effectiveness, and (6) ease of revision.

Since 2003, the concept of blended learning was introduced into China. Chinese scholars also launched an in-depth study on blended learning. Huang [6] points out that "blended learning refers to the integrated use of different learning theories, different technologies and different application methods, and ways to implement a strategy of teaching through the organic integration of face-to-face classroom learning and digital learning. Blended learning becomes the main trend of the current teaching applications" Mawu Lin [7] explores the blended learning model of college English based on the Internet in an experimental way, which aims to resolve the paradox between limited contents of classroom teaching and students' personalized learning requirements, to stimulate students' learning interests, and to enhance the quality of college English teaching. He divided the model into three stages. In the first stage, the learners use a college English online learning platform to start self-autonomous language learning; the second stage requires the language learners to exchange opinions and share language learning experiences via a Web 2.0 platform; finally, the language learners and the teachers exchange their understanding in the classroom.

## 3. The advantages of mobile intelligent terminals

In recent years, with the rapid development of China's mobile Internet industry, Internet users have been increasing. Meanwhile, the mobile intelligent terminal market is rapidly growing. According to the report of China Internet Network Information Center [8] data show that as of December 2015, the number of China's mobile phone users reached 620 million. 90.1% Internet users get on the Internet by smart mobile phones, while Internet users with tablet PC account for 31.5%. The universal application of smart phones, iPad and other mobile intelligent terminals has a profound impact on people's daily lives. With the rapid development of wireless network technology, mobile intelligent terminals are able to meet the various needs of people with its powerful functions. In the field of education, mobile intelligent terminals also show its unparalleled advantages in the aspects of its mobility, functionality and interactivity.

### A. Mobility

Whether it is a smart phone, tablet or laptop, mobility is the basic feature of mobile intelligent terminals. Mobile intelligent terminal is easy to carry, which makes ubiquitous learning possible. As Bonk claims: Anyone can now learn anything from anyone at anytime [9]. No matter where the learner is, he can learn without the constraints of the classroom learning. The learner can learn in the library, on the bus, or in the parks. With the use of mobile intelligent terminals, learners are able to achieve mobile learning.

### B. functionality

With the development of science and technology, mobile intelligent terminals are more and more powerful with various functions. It can be a video player, e-book, portable dictionary or other devices at the same time. Learners can download different APPs to realize various functions. For example, if an English learner wants to improve his oral English he can download an APP called "Liulishuo" to practice oral English everyday, if he wants to memorize more words he can take down the new words on his smart phone. Powerful functions of mobile intelligent terminals can meet students' individual learning needs.

### C. Interactivity

With a smart phone or an iPad you can always get the information you want, and catch up with others through Twitter, Facebook, Wechat, and other social networks. Through a network connection, students and teachers can realize immediate or delayed communication. This interaction will help increase interest in learning and learning efficiency.

## 4. BLENDED LEARNING MODEL DESIGN

In the information age, students can not learn without the network information technology. To implement blended learning via mobile intelligent terminals is of great importance. The author designed the following learning mode on the basis of teaching practice.

The first stage is the pre-class self-study stage. According to the teaching aims the teacher delivers the learning tasks through QQ or WeChat before class. The teacher points out the theme or the main contents, and requires students to search for relevant information in advance. Students are divided into several groups to organize and present learning materials.

The second stage is the stage of classroom instruction. In the classroom teacher gives the lecture, students and the teacher get a face to face communication. Since the mobile intelligent terminal has the feature of storage and portability, students can collect information before class and store it on the phone or iPad, which makes it convenient to be presented at any time in the classroom. At the same time smart phone or iPad can also easily record the process of teaching by taking pictures or recording teacher's talks. So some important contents can be recorded immediately in the class and facilitate after-school review.

The third stage is about after-school consolidation and feedback. After school teachers deliver consolidated review task. Students may review what they learned in the class by the information stored in the intelligent terminals. Or they can continue to look to extend knowledge. As for the knowledge they didn't understand, they can turn to the classmates or teachers for help through QQ, or Wechat to obtain immediate or delayed answers. Especially for a hearing or oral course, learners can download relevant learning APPs, such as scallops hearing, daily English listening, English cocoa, and so on. Learners can listen and practice at anytime, thereby greatly increasing interest in learning and learning efficiency.

## 5. CONCLUSION

Compared with traditional media, mobile intelligent terminals in the study have great advantages. we should make good use of these advantages to better achieve self-learning. No single learning model can solve all the problems and satisfy the needs of teaching and learning at any time. Only by organically integrating various learning models and utilizing their respective advantages can the efficiency of teaching and learning be optimized. Online learning can not completely replace the class instruction; guiding role of teachers can not be ignored. Only by the perfect combination of teacher's instruction and student's initiative learning can the best results of the study be achieved.

## ACKNOWLEDGMENT

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# The Combination of Chinese Traditional Culture and Modern Teaching Rule

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Abstract: Simple law, Education law and Two main law is the general rule of objective existence in the teaching process. Chinese traditional culture for the social fashion, morality and ethics, values play an important guiding role. The traditional Chinese culture through teaching, to improve the teaching effect, enrich the teaching content, improve the quality education aspects also has practical significance. the meaning of the Chinese traditional culture to discover and explore in the teaching rule, and order to promote to carry forward the Chinese traditional culture as the main content of quality education to provide the reference.

Keyword: Chinese traditional culture, quality-oriented education; objective law of teaching

## 1. INTRODUCTION

China has over five thousand years of history, with cultural heritage continuously retained. In thousands of years of culture accumulation and precipitation, Confucianism, Buddhism and Taoism-based traditional Chinese culture gradually formed. Wherein, Buddhist culture is alien, while Confucianism and Taoism are local. After long-term evolution and integration, inclusive, introverted, kindhearted, equal, mild, wise cultural identity gradually formed. Chinese traditional culture is not only a cultural system, but also an educational system. It is under such cultural nourishment, Chinese nation is endless and continuous. By analyzing combination of Chinese traditional culture and modern teaching, this paper focuses on the role of traditional culture in teaching law, to provide a reference for promotion of Chinese traditional culture and improvement of quality education.

## Significance of Chinese Traditional Culture in Modern Education and Teaching

General Secretary Hu Jintao pointed out in Tsinghua University Centennial Celebration that the basic principle of our education is people education oriented, moral education first, ability focused and all-round development [1]. Education should cultivate talents with reasonable quality structure, which includes quality of physical, psychological, cultural, ideological aspects and should be a comprehensive quality system [2]. However, basis of quality originates from the nation's common psychology, religion, culture, so we must attach importance to ethical relationships, moral rules and social philosophy jointly developed by the Chinese nation which has continued for thousands of years. The vast and deep cultural system and ideology has a guiding role for students to establish lofty ideals and aspirations, develop a strong will, purify the mind, enhance the moral and ethical level and promote personnel quality training.

## 2. PRACTICE OF TRADITIONAL CHINESE CULTURE IN MODERN TEACHING

"Simple law" in teaching law means that in the teaching process, indirect knowledge and direct knowledge should be organically combined with indirect knowledge as the basis to enable students to quickly and simply grasp relatively complete knowledge and avoid detours. Traditional Chinese culture is a knowledge system practiced and summarized by ancestors over thousands of years. With objectivity, scientificity, development, it is time-tested and refined cultural treasure which includes various contents such as humanities, social sciences, ethics science, life science, natural sciences. If its humanities is ingeniously combined with taught subject knowledge, not only depth and breadth of teaching content will be increased, but also students' learning interest and teaching effect will be improved.

For example, in the course "Introduction to Art" of fine arts, purely theoretical explanation of the relationship between art and politics will inevitably lead to obscurity and singleness of class content. But interpretation of the problem with generation and content of famous Chinese literary classic "Book of Songs" will enable students to have more direct and clear understanding of mutual influence between art and politics. "Book of Songs" is divided into three parts of "Wind", "Ya" and "Song", of which contents of "wind" are folk song with strong flavor of life for the people to comment on current affairs and express civil life; "Ya" are orthodox poetry music in Zhou Dynasty rule area, i.e. court music; "Song" are music lyrics composed by vassal state to worship and pay tribute to the rulers. Through analysis of formational background and content of "Book of Songs", the relationship between politics and art is obvious.

For another example, in explanation of Chinese art works appreciation, in addition to students' observation of techniques and artistic effect of paintings, analysis and interpretation of ideology, culture, story involved in content, background of painting subject will enable students to quickly learn artistic characteristics and essence of paintings, while improving students' interest in learning and teaching effect. Thus, learning and desultory reading of Chinese traditional culture will not only strengthen the teaching effect, enhance content height and ideology, but also increase vitality and interest of teaching.

Chinese traditional culture concepts and ideas have meaning of aesthetic level and aesthetic realm, featuring feelings of concern for the country and people and regarding it as one's own responsibility to watch for the people all over the country. These contents will unconsciously develop personality and ideology of educators with oriental culture characteristics. For example, Fan Zhongyan's "to concern about the country and the people before anything else, to enjoy only after the people can enjoy", Wen Tianxiang's "everyone must die, let me but leave a loyal heart shining in the pages of history" are portrayal of Chinese traditional culture and ideology in life, life values. With the deepening of teaching, these thoughts and feelings will inevitably have a major impact on moral quality culture of students.

Teaching naturally consists of students' ideological education, and interaction between teaching and learning will inevitably impact students' emotion, position, point of view, will, character, etc. [3]. Hence, every word and action, gestures and expressions of teachers will produce subtle educational effect on students, while deep impact of this effect is difficult to estimate. In China's traditional culture, founder of Buddhism, Confucianism appeared as teacher's image. Their words and deeds, ideals and taught wisdom have benefited countless people over thousands of years. Therefore, teachers must be keenly aware of their responsibility and mission, influence and edify students whose view of life and world are still in development with their knowledge, moral character, so as to cultivate more all-round talents with knowledge, responsibility, vision for the sake of benign development of human society.

In the process of teaching, while mastering knowledge, students also develop ability in aspects such as intelligence, aesthetic appreciation, personality, will, etc. Intellectual and moral education constitute an important part of college students' cultural quality education, the purpose of which is to promote students' training and development of knowledge, ability and personality. Chinese traditional culture serves as valuable experience summarized and practiced by predecessors, with complete methodology and learning system. By absorbing and learning traditional culture, students can identify today with the past. Providing a reference for solving current and future problems, it develops students' application and practical ability and accumulates experience for students' further learning [4].

In teaching, teachers act as the lead, while students serve as the main body, the two forming relationship of dialectical unity. French educator Rousseau thinks that teaching not only make teaching subject master the "yardstick", but also to make them discover yardstick. This means that teachers should have a good "humanism" spirit, that is, emphasize human dignity, personality, ideals, aspirations, etc. and face students' development with open and democratic attitude. Confucian "taking good advantage of moral construction to make people live well", "everyone can be a sage" reflects humanistic feelings of consideration to the world.

Compared with traditional education, absolute authority status of teachers in modern education has changed, and students have changed from passive recipients to active participants and creators. Therefore, purposes of education are not only "propagating doctrine", "imparting professional knowledge", "resolving doubts", but also help learners discover the known truth, and bravely, independently explore mystery of unknown world. Teachers must pay attention to students' ideas, and actively guide students in initiative, creative learning. They should respect, encourage, care students, not frustrate students, correctly persuade their ideas via teaching, find rationality and originality of their thought; so that students dare to innovate, be good at innovation, thus achieving the goal of quality education.

## 3. PRACTICAL SIGNIFICANCE OF TRADITIONAL CHINESE CULTURE IN IMPROVING TEACHER QUALITY

Chinese traditional culture can also promote harmonious teacher-student relationship. Human life is a self-improvement process of inner spirit. The best quality of teachers is not necessarily knowledge, but good temperament, which is particularly important for student learning and enlightenment. Confucius' students evaluated him with five words of "mild, kind, respectful, thrift, modest", of which, mild ranks the first. It can be seen that moderate attitude and temperament brings great affinity, which makes others more readily accept and adopt. In real teaching, teachers with moderate attitude are more likely to be favored by students, especially in resolving conflicts and pointing out problems as they are more easily understood and accepted by students. However, not everyone can have moderate attitude to make others feel good. Therefore, teachers need to pay attention to cultivation of self-quality and read more books. As the saying goes, "a really learned man will have a gentle temperament". Many cultural ancient books are conducive to soft temperament. For instance, "Zhuangzi", with beautifully written text and tranquil, far-reaching artistic conception, lists a number of vivid characters to inspire people. In "Confirmation of Morality", Ai Tuota from State of Lu, though ugly, has soft temperament "and often goes along with others", becoming a model with charismatic personality. Confucius also considered that mild temperament is demonstration of sufficient virtue. Learning Chinese traditional culture is a positive and effective way for teachers to improve themselves, improve the intrinsic qualities and cultivate dedicated heart, indifferent ambition, virtue of loving students. While teaching students, teachers can set an example for and exert positive impact on upright temperament, character of students.

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# Research on the Environment of Modern Educational Technology of Physical Education in Colleges and Universities of Hunan Province

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Abstract: The environment of modern educational technology of physical education in colleges and universities of Hunan province is taken as the object of study. The environment of modern educational technology of physical education in colleges and universities of Hunan province is analysed through the use of literature, questionnaire, mathematical statistics, and so on, to expose essentially the existing problems of the environment of modern educational technology of physical education in colleges and universities in order to strengthen the building of the environment of modern educational technology, to improve the quality of education, to promote educational reform, hence promote the teaching reform of college sports.

Keywords: College sports, teaching of modern education technology, environment

The environment of modern educational technology refers to the systematic IT facilities and conditions in the practice of teaching and learning activities. The environment here is mainly based on the scope of modern educational technology which includes hardware, software, and the human environment, and the three aspects are interdependent and mutually reinforcing, constituting an organic whole of coordinated development. Correspondingly, the environment of modern educational technology includes environment of hardware, software, human being, among which the hardware environment is the foundation, the software is guarantee, the human environment is the key, and the three is mutual promotion and indispensable. The development of environments of physical education technology is taken as the traction in order to promote the change and innovation of ideas, models, teaching content and methods of physical education, while further improving teachers'quality of education technology of colleges and universities so as to make the quality of education technology of teachers adapt to the requirements for information and modernization of higher education as soon as possible, to continuously improve the level of application of modern educational technology, to promote the reform and development of higher learning.

## 1. OBJECTS AND METHODS OF STUDY

80 physical education manager in Hunan University, Central South University, Changsha college, Hunan Normal University, Xiangtan University, Hunan University of Science and Technology, Hunan Institute of Engineering, Hunan University of Industry and so on are taken as the surveyed objects, and the environment of modern educational technology of physical education of colleges and universities are taken as the objects of study[1].

## 2 RESEARCH METHODS

### 2.1 Literature

A large number of papers and books on modern educational technology, physical education theory, physical education of colleges and universities are consulted through access to China National Knowledge, China Education and Research Network, and so on, to provide new ideas and methods for this study.

### 2.2 Questionnaire

80 physical education managers in Hunan University, Central South University, Changsha college, Hunan Normal University, Xiangtan University, Hunan University of Science and Technology, Hunan Institute of Engineering, Hunan University of Industry and so on are given questionnaire of survey. A total of 80 questionnaires are given, and 80 questionnaires are recovered, and the recovery rate is 100%, and the valid questionnaires are 80, the valid rate is 100%.

Before putting out questionnaires, a total of 10 experts are consulted, who test the validity of the questionnaire. The specialists who consider that the designed questionnaires are appropriate account for 90%. The method of retest reliability are used to test the reliability of the questionnaire, the questionnaire are conducted again after four weeks , R=0. 825, P〈0. 05.

### 2.3 Mathematical statistics

In this paper, the collected information is processed by the use of SPSS17.0 and scientific and mathematical statistics[2].

### 2.4 Logical analysis

The logical approach such as induction and analogy are used to analyse the environment of modern education technology of physical education of colleges and universities in Hunan province in the course of study,to classify the data and related data, and to provide useful countermeasures and suggestions for teaching reform of college sports[3].

## 3. THE PRESENT SITUATION OF ENVIRONMENT OF MODERN EDUCATIONAL TECHNOLOGY OF PHYSICAL EDUCATION IN COLLEGES AND UNIVERSITIES

### 3.1 An Analysis of the use of multimedia classroom of physical education in colleges and universities

As shown from table 1, colleges and universities that about 25 percent of physical education courses can be completed in multimedia classrooms account for 15 percent, colleges and universities that about 50 percent of physical education courses can be completed in multimedia classrooms account for 46.25 percent, colleges and universities that about 75 percent of physical education courses can be completed in multimedia classrooms account for 25 percent, and only more than 75 percent of physical education courses can be completed in multimedia classrooms account for 13.75 percent. It is shown that the number of multimedia classrooms limit multimedia teaching of sports to some extent, and the advantage of modern educational technology in sports teaching can not fully brought into play, and the quality of physical education is also difficult to upgrade[4].

Table 1. Questionnaire of multimedia lesson hours in the total hours of physical education in colleges and universities

| The share of multimedia lesson hours in total hours | Number of people | Proportion |
|---|---|---|
| 1%-25% | 12 | 15% |
| 25%-50% | 37 | 46.25% |
| 50%-75% | 20 | 25% |
| 75%-100% | 11 | 13.75% |

### 3.2 An analysis of the situation of modern teaching equipment being used in sports teaching

The number of modern teaching equipment being used in teaching is a key factor restricting teaching. It is found from the survey of colleges and universities in Hunan province that there are very adequate modern teaching equipment being used in sports teaching in 3.75 percent of colleges and universities, and there are relatively adequate modern teaching equipment being used in sports teaching in 6.25 percent of colleges and universities, and there are adequate modern teaching equipment being used in sports teaching in 32.5 percent of colleges and universities, and there are insufficient modern teaching equipment being used in sports teaching in 57.5 percent of colleges and universities. It is shown that there are insufficient modern teaching equipment being used in sports teaching in more than half of the colleges and universities.

Table 2. Questionnaire of the number of modern teaching equipment of physical education in colleges and universities

| The number of equipment | Very adequate | relatively adequate | Adequate | Not adequate |
|---|---|---|---|---|
| Number of people | 3 | 5 | 26 | 46 |
| Proportion | 3.75% | 6.25% | 32.5% | 57.5% |

### 3.3 The situation of modern teaching equipment being used in sports teaching in colleges and universities

The running situation of modern teaching equipment being used in sports teaching in colleges and universities of Hunan province is shown as Table 3, 7.5% of teaching equipment is running well, 28.75 percent of teaching equipment is running relatively well, about 40.0% of teaching equipment is running generally, and 23.75 percent of teaching equipment is running poorly. It can be seen that there are some problems in teaching facilities of some colleges and universities so as not to meet the needs of sports teaching. Presently, the teaching equipment used for sports teaching in most colleges and universities basically can meet the requirements for teaching.

Table 3. Questionnaire of modern teaching equipment quality used for sports teaching of colleges and universities

| The quality of equipment | Well | relatively well | Generally well | Poor |
|---|---|---|---|---|
| Number of people | 6 | 23 | 32 | 19 |
| Proportion | 7.5% | 28.75% | 40.0% | 23.75% |

### 3.4 Present situation of the utilization of resources of physical education

Resources of physical education refers to various materials and conditions for the effective implementation of physical education, generally including textbooks, cases, videos, pictures, multimedia courseware, persons qualified to teach, teaching aids and infrastructure, and so on. If modern educational technology shall be taken full advantage of in the process of physical education of colleges and universities, not only teaching facilities of hardware, such as multimedia classrooms and campus network, but also a good teaching resource environment are needed. Only these conditions are met, the proper teaching value can be achieved. There are the following problems through the investigation of the existing resources of physical education in colleges and universities of Hunan province[5].

#### 3.4.1 Serious shortage of physical education Resources

As shown from table 4, based on daily feedback and evaluation from teachers and students, teaching managers think that 3.75% of teachers and students are very satisfied with sports teaching resources, and 20% of teachers and students are relatively satisfied with sports teaching resources, and 28.75% of teachers and students are generally satisfied with sports teaching resources, and 47.5% of teachers and students are dissatisfied with sports teaching resources. Clearly, lack of physical education resources severely restricts the reform of teaching.

Table 4. Questionnaire of satisfaction with physical education resources of colleges and universities

| Satisfaction with teaching resources | relatively satisfied | generally satisfied | Dissatisfied |
|---|---|---|---|
| Number of people 3 | 16 | 23 | 38 |
| Proportion 3.75% | 20.0% | 28.75% | 47.5% |

### 3.4.2 Role of campus network in physical education

As shown from table 5, there are applications of sports teaching in 6.25% of the campus network of colleges and universities. About 51.25% of campus network is mainly used for administration, and 42.5% of campus network is just used for the propaganda of image. It is shown that the advantages of campus network in physical education is not fully brought into play, and teaching function of the campus network is not perfect, and campus network of some colleges and universities just play the advocacy role, only a handful of the campus network are used for sports teaching.

Table 5. Questionnaire of the function of campus network

| Application of the campus network | Number of people | Proportion |
|---|---|---|
| Full function | 0 | 0.0% |
| propaganda | 34 | 42.5% |
| Administration | 41 | 51.25% |
| Application of physical education | 5 | 6.25% |

### 3.4.3 Serious lack of physical education curriculum resource on network

Table 6 shows the situation of development of network curriculum of physical education in colleges and universities of Hunan province, showing that no college put all the sports courses on the net,work, and 5.0% of colleges and universities put most courses on network, and 16.25% of colleges and universities put a small amount courses on network, and there is no online course in 78.75% of colleges and universities. It is shown that very few network curriculum are developed for physical education in colleges and universities of Hunan province. Even if the network curriculum are developed, it is only a small amount of fine courses, the vast majority of colleges and universities never develop online courses of sports.

Table 6. Questionnaire of online course situation of physical education of colleges and universities

| Online course situation | Number | Proportion |
|---|---|---|
| All courses online | 0 | 0.0% |
| Most courses online | 4 | 5.0% |
| A small number of courses online | 13 | 16.25% |
| No online courses | 63 | 78.75% |

### 3.4.4 Lack of teaching platform of network sports

Network teaching platform is a flexible, scalable and interactive teaching and learning support platform which fully absorbs the latest research results of educational technology theory and methods, and applies network technology, is suitable for a variety of levels, objects and network environments, based on different teaching mode and the characteristics of different objects of education. As shown from table 7, there is no teaching platform of network sports in 93.75% of colleges and universities, further showing that there is no teaching platform of network sports in the majority of colleges and universities of Hunan province, lack of the network platform seriously affects physical education.

Table 7. Questionnaire of teaching platform of network sports in colleges and universities

| Platform | Yes | No |
|---|---|---|
| Number of people | 5 | 75 |
| Proportion | 6.25% | 93.75% |

## 4. CONCLUSION

### 4.1 Increasing investment in hardware infrastructure

If the modern educational technology are to be developed in the process of teaching in colleges and universities, investment in hardware infrastructure is the foundation. The configuration of hardware infrastructure in physical education may reflects the level of modernization of physical education of colleges and universities which should strengthen investment in the multimedia classroom, online classrooms, sports stadiums and equipment of modern educational technology matching with venues. Meanwhile, the requirements for hardware construction made by modern educational technology are relatively high, which requires us to continuously improve and maintain the related facilities, and to conduct scientific management,to configurate the teaching resources in a reasonable way so that the teaching environment with good hardware are created to better serve the sport teaching, while increasing the amount of hardware investment.

### 4.2 Increasing construction of the campus network

Currently, most of campus network applications in colleges and universities are confined to propaganda and administration, and very little are used in teaching, ignoring the teaching and learning function of campus network. Therefore, aid software construction of physical education should be strengthened, and software resources should be optimized in order to best meet the needs of teachers and students of physical education.

## 4.3 Strengthening the development of curriculum of network physical education

Network teaching of sports is teaching and learning activities which rely on the campus network, related facilities and software. Online courses break the limits of time and space of traditional sports teaching and learning, characterized by abundant resources, sharing, interaction, providing students with an open learning environment and the free learning time so as to help students learn and cultivate innovation ability of students. With the continuous development of science and technology, the society needs compound talents with high-quality. Therefore, colleges and universities must increase efforts to develop online courses, and the construction of the network teaching resources requires a lot of manpower and financial resources, which is a long process.

## 4.4 Establishing teaching platform of sports network

With the rapid development of information technology and the popularity of network technology, network teaching more and more attracts attention, producing teaching platform of network.Network teaching platform is a flexible, scalable and interactive teaching and learning support platform which fully absorbs the latest research results of educational technology theory and methods, and applies network technology, is suitable for a variety of levels, objects and network environments, based on different teaching mode and the characteristics of different objects of education. Therefore, we should fully learn the advanced practices, establish a network teaching platform, and join the application of network teaching of sports.

## SUBJECT

The stage results of the twelve-five subject of Hunan Education Planning, subject number(XJK012BTM004).

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# Research on the Modern Educational Technology in Physical Education Used by Teachers of Colleges and Universities of Hunan

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Abstract: In this paper, literature, questionnaire and mathematical statistics are used to survey the situation of the application of modern educational technology used by physical education teachers of colleges and universities in Hunan province, to analyse the application of modern teaching methods, multimedia courseware, modern technology of theory and practice courses, and training in colleges and universities, to find shortcomings, to make the corresponding suggestions and countermeasures so that the bad situation of the physical education in colleges and universities of Hunan province are changed, the function of modern educational technology are maximized in the physical education of colleges and universities, and the ability of the application of modern educational technology are promoted.

Keywords: colleges and universities; physical education; modern educational technology;application

Teachers are the main body of physical education of colleges and universities, and plays the dominant role in the design, development, management, utilization, evaluation of teaching resources of sports, also the direct operator of physical education reform. Sports teacher' s age is a bottleneck restricting teaching of physical education teachers, some of the more difficult, strong demonstration actions are often limited to teachers with age, but the application of modern educational technology can make up the shortcoming of physical education in age, gender, hobbies of teachers, and improve the standard of teaching of physical education teachers, teaching quality, and teaching effect.

## 1 OBJECTS AND METHODS OF STUDY

### 1.1 Objects of study

120 physical education teachers in Hunan University, Central South University, Changsha college, Hunan Normal University, Xiangtan University, Hunan University of Science and Technology, Hunan Institute of Engineering, Hunan University of Industry and so on are taken as the surveyed objects, and their application of modern educational technology in physical education are taken as the case study [1].

### 1.2 Research Methods

### 1.2.1 Literature

A large number of papers and books are consulted through access to China National Knowledge, China Education and Research Network, and so on, to provide new ideas and methods for this study[2].

### 1.2.2 Questionnaire

120 physical education teachers in Hunan University, Central South University, Changsha college, Hunan Normal University, Xiangtan University, Hunan University of Science and Technology, Hunan Institute of Engineering, Hunan University of Industry and so on are given questionnaire of survey. A total of 120 questionnaires are given, and 115 questionnaires are recovered, and the recovery rate is 95.83%, and the valid questionnaires are 110, the valid rate is 95.65%.

Before putting out questionnaires, a total of 10 experts are consulted, who test the validity of the questionnaire. The specialists who consider that the designed questionnaires are appropriate account for 90%. The method of retest reliability are used to test the reliability of the questionnaire, the questionnaire are conducted again after four weeks, $R = 0\ 825$, $P <0\ 05$.

### 1.2.3 Mathematical statistics

In this paper, the collected information is processed by the use of SPSS17.0 and scientific and mathematical statistics.

### 1.2.4 Logical analysis

The logical approach such as induction and analogy are used to analyse the situation of use of modern educational technology in physical education teachers of colleges and universities of Hunan province, to classify the data and related data, and to provide useful countermeasures and suggestions for teaching reform of college sports[3].

## 2. THE PRESENT SITUATION OF APPLICATION OF MODERN EDUCATIONAL TECHNOLOGY OF SPORTS TEACHER IN COLLEGES AND UNIVERSITIES

### 2.1 The present situation of application of modern teaching methods of physical education teachers

As shown from table 1, 27.28 percent of sports teachers of colleges and universities almost use explanation and demonstration for teaching, 60.91% physical education teachers of colleges and universities use little other teaching methods in addition to demonstrations, and only 11.81% physical education teachers can apply teaching methods in a flexible way. This shows that most of the sports teachers of colleges and universities are merely good at using the traditional teaching methods, such as, explanation and demonstration.

Table 1. Questionnaire of the situation of teaching methods used by teachers in addition to explanation and demonstration

| situation of teaching methods | Number of people | Proportion |
|---|---|---|
| single teaching method | 30 | 27.28% |
| Flexible and diverse teaching methods | 67 | 60.91% |
| Flexible teaching methods | 13 | 11.81% |

### 2.2 Present situation of the application of modern educational technology in practice course and theory course

As shown from table 2, sports teachers of colleges and universities, who apply regularly modern educational technology in the theory course account for 87.76%, who apply occasionally modern educational technology in the theory course account for 11.12%, who never apply modern educational technology in the theory course account for 1.12%. The situation of the application of modern educational technology in practice courses is as follows: 20.12% of teachers frequently use, 45.27 of teachers occasionally use, 34.61% of teachers never use. It shows that the modern education technology has a greater impact on the theory courses, most of the teachers can apply the modern educational technology in theory courses, but few teacher apply the modern educational technology in practice courses. It can be found through investigations that some teachers believe that the modern educational technology of sport practice courses is influenced by teaching content, teaching resources and learning environment.

Table 2 Questionnaire of the situation of application of modern educational technology in theory and practice course

| | Often used | Occasionally used | not used |
|---|---|---|---|
| Theory Course | 87.76% | 11.12% | 1.12% |
| Practice Course | 20.12% | 45.27% | 34.61% |

### 2.3 The situation of modern teaching media used by physical education teachers

As shown from table 3, the modern teaching media that physical education teachers can skillfully use is multimedia computers and networks, 42.33% of physical education teachers are able to skillfully operate multimedia computers, and 51.23% of physical education teachers are able to skillfully use networks, and 36.58% of physical education teachers are able to skillfully use recorder, and the proficiency of the use of other media is relatively low, and the proportion of skilled operators are less [4].

Table 3 Questionnaire of the proficiency of Commonly using modern teaching media

| | Very skilled | More skilled | Generally skilled | Unskilled |
|---|---|---|---|---|
| Multimedia Computer | 42.33% | 23.71% | 33.56% | 0.4% |
| Network | 51.23% | 20.12% | 26.42% | 2.23% |
| Digital camcorders | 12.46% | 17.42% | 28.95% | 41.17% |
| Projector | 18.65% | 26.43% | 36.74% | 18.18% |
| Slide | 16.75% | 27.76% | 47.55% | 7.94% |
| Video Showcase | 16.55% | 23.88% | 34.56% | 25.01% |
| recorder | 36.58% | 37.89% | 25.53% | 0 |

### 2.4 The situation of modern teaching software applied by physical education teachers

As can be seen from table 4, the proficiency of modern teaching software applied skillfully by physical education teachers is word and PPT, respectively accounting for 92.53% and 80.2%. As to software with high content of technology, such as Wash and Authorware, physical education teachers who are are able to unskillfully use account for 65.3% and 72.48%. It shows that the operation related to teaching software used by physical education teachers needs to be improved.

Table 4. Proficiency questionnaire of Commonly used teaching software

| | Skilled | More skilled | Unskilled |
|---|---|---|---|
| PPT | 35.45% | 44.75% | 19.8% |
| Word | 44.65% | 47.88% | 7.47% |
| Flash | 15.75% | 18.95% | 65.3% |
| Authorware | 9.86% | 17.66% | 72.48% |

### 2.5 Factors affecting the application of modern educational technology by physical education teachers

As can be seen from table 5, with respect to the application of modern educational technologies, teachers thinking that insufficient teaching resources affect the use of modern educational technology account for 49.09%, believing that the devices are unusable account for 59.09%, thinking that insufficient teaching software affect the use of modern educational technology account for 31 82%, believing that the leadership does not pay attention to the use of modern educational technology account for 36.75%, thinking that the limited capacity affect the use of modern educational technology account for 38.18%, thinking that no incentive policies affect the use of modern educational technology account for 34.55%. It shows that the main reasons for affecting the application of modern educational technology are insufficient teaching resources, the unusable teaching equipment, teachers'limited capacity to use, insufficient teaching software. The degree of importance attached by the leadership also affects the application of modern educational technology.

Table 5. Questionnaire of factors affecting modern educational technology used by PE teacher

| Factors | Number of people | Proportion |
|---|---|---|
| insufficient teaching resources | 54 | 49.09% |
| insufficient teaching software | 35 | 31.82% |
| ignored by leaders | 43 | 39.09% |
| insufficientequipment | 65 | 59.09% |
| Limited capacity | 42 | 38.18% |
| No incentives | 38 | 34.55% |

## 2.6 The present training situation of PE teachers participating in the modern educational technology

### 2.6.1 The training situation of PE teachers participating in the modern educational technology

As shown from table 5, 45.46% of PE teachers do not participate in the training of modern educational technology organized by colleges and universities, 47.27% of PE teachers occasionally participate in the training of modern educational technology, and 7.27% PE teachers never participate in the training of modern educational technology. It shows that the training of modern educational technology organized by colleges and universities is far deficient, even a lot of colleges and universities never organize teachers to participate in the training of modern educational technology.

Table 7. Questionnaire of training situation of PE teachers' modern educational technology organized by colleges and universities

| Training situation | Number of people | Proportion |
|---|---|---|
| Regular training | 8 | 7.27% |
| Occasional training | 52 | 47.27% |
| No training | 50 | 45.46% |

## 3. COUNTERMEASURES

### 3.1 Establishing the ideas of modern sports teaching

Physical education teachers'awareness of modern educational technology and knowledge have been continuously improved through the transformation and renewal of teachers'teaching concepts so that they establish a correct concept of education and have a correct understanding of teaching mode, teaching methods, teaching effectiveness of modern educational technology.PE teachers of colleges and universities must recognize the importance of modern educational technology in teaching, and establish a correct concept of modern educational technology in order to improve the effectiveness and quality of physical education through the use of modern educational technology[5].

### 3.2 Strengthening the study of theoretical knowledge of modern educational technology

There are deficiencies in theoretical knowledge of modern educational technology of teachers of colleges and universities, who should strengthen learning theoretical knowledge of modern educational technology so that modern educational technology function effectively in physical education.

### 3.3 The flexible organization of teaching through the use of modern educational technology

PE teachers should achieve the combination of the static and the dynamic of physical education, both vivid illustrations and visual image through multimedia teaching platform, such as video, animation, images, sounds of multi-media so that sports knowledge is taught to students in a lifelike, frank and visual way. Teaching is organized in a flexible way through the use of advanced modern educational technology so that the colorful physical education is shown.

## SUBJECT

The stage results of the twelve-five subject of Hunan Education Planning, subject number (XJK012BTM004)

## REFERENCES

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