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Impact of Mathematic Culture on the Quality of College Students

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Abstract
A university is an important base to inherit, lead, and innovate culture. Mathematic culture is an important component of college students' cultural literacy. With the development of higher education and the expanding of enrollment, it is essential that universities pay more attention to mathematic culture to enhance both the college students' quality and core competitiveness, and the universities' soft power.

Key Words: Mathematic culture; Quality of college students; Effect

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INTRODUCTION
Education plays a unique role in the succession of knowledge, the development of society and the progress of humanity. Education is an important part of human culture, and "it is a process of social culture" (Zhen, 2000). Chinese traditional mathematic education has always attached importance to imparting mathematical knowledge, training mathematic skills, and fostering mathematic ability. This concept is based on that mathematics is a useful tool in understanding and transforming the world, which puts emphasis on the functional value. However, throughout the historical progress of mathematic development, we should pay more attention to the cultural value of mathematics and incorporate mathematic education in university into wider field of culture, which means that improving traditional mathematic education penetrate into mathematic culture. The ultimate aims are to improve college students' mathematic quality and to lay a good foundation for their lifelong sustainable development. Our humanity has entered the information economy epoch, which puts forward higher requirements for overall qualities of the people and the level of thinking. Our country beginning to expand enrollment since 1990s, the number of the college students has expended year by year. Higher education has already turned from elite education to the popular stage. It is high time that university should adjust connotative development. Universities shoulder the important mission of cultivating the quality of nation.

1. CONCEPT ANALYSIS OF MATHEMATIC CULTURE
Mathematic culture, as a focus in modern research of international mathematical education, has already been widely paid attention by people. It is a new attitude and new thought to the world by people that mathematics is regarded as a completely new culture. It represents an unprecedented exploratory and innovative spirit that mathematic is regarded as behavior of culture research (Zhang, 2005). People has long regarded mathematic as an instrumental subject, while neglecting the education value of mathematic culture, which has caused mathematic quality education could not be faithfully and comprehensively carried out. Therefore, deeply understanding of the cultural connotation in mathematics is very important and necessary.

"Mathematic culture" may be quite strange to many people. It focuses on mathematics from the cultural angle, emphasizing the culture value of mathematics. In the narrow sense, mathematic culture refers to thought,

spirit, method, viewpoint and language of mathematics. Mathematical culture in the narrow sense refers to the thought, spirit, method, mathematical point of view, language, and their formation and development; and the generalized refers to the relationship between the history of mathematics, mathematicians, beauty of mathematics, mathematics education, the culture component of mathematics development and the relationship between mathematic and diverse cultures. Mathematical culture belongs to the culture of science, a kind of rational culture. Mathematics as a culture, in addition to some common features of culture, there are some other unique characteristics, which are the main aspects which is different from other cultural forms, the core of culture is a kind of spirit, mathematics cultural influence is the spirit of mathematics on people's motivation and guiding role, and the spirit of mathematics is to learn and by using the method of mathematical way of thinking of the trust. No matter what people engaged in work, thinking deeply engraved in mind in mathematics thought, mathematics and look at the issue point of view, but whenever and wherever possible role, the mathematical literacy benefit a person for life.

2. URGENCY OF SPREADING MATHEMATIC CULTURE: UNIVERSITIE AS THE CARRIER

Professor Martin Trow, American famous education sociologist, former director of Education Research Center in University of California, Berkeley, proposed the education stage theory of "elite", "mass" and "popularization" in 1962. He put forward the concept of "mass higher education". In 1970, he proposed the concept of "popularization of higher education". In 1973, he proposed three stages theory of "popularization of higher education". Hence, higher education popularization theory came into being. According to Martin Trow' s theory, if gross enrollment rate of higher education is less than 15%, higher education is in elite education stage. If gross enrollment rate of higher education is more than 15% and less than 50%, higher education is in mass higher education stage. If the gross enrollment rate of higher education is more than 50%, it is in popularization stage. The figures from the Ministry of Education show that from 1998 to 2002 the number of the national university enrollment increased from 1.08 million to 3.04 million. The gross enrollment rate of higher education reached more than 15%. In 2003, national ordinary universities and vocational colleges (specialist) enrolled 3.82 million new students which increased 19% than 2002. The number of all forms of higher educational students reached 19 million, 3 million more than 2002. The gross enrollment rate of higher education reached 17% (Gu, 2007).

During the stage of popularization education, higher education is facing new requirements and new challenges from the new era. With the successive years of enrollment and inflate development of higher education, it caused many problems such as resources construction for each students and decreasing of education literacy. Problems of higher education' teaching quality have become an increasingly concerned topic. Knowledge-based economy ages are also information-based ages which does not need talents who are without or lacking in mathematic qualities. Mathematic teaching is not only to let students grasp an important "tool" or "method", but to let students build a new kind of thinking model. The cultivation of mathematical skills and mathematic literacy are complementally to each other. Mathematic literacy is an important component of the national culture quality. The education of mathematic culture is the effective way to increase people's mathematic literacy. The education of mathematic culture in university has been imperative.

3. IMPACT OF MATHEMATIC CULTURE ON STUDENTS' QUALITY IF INTEGRATED INTO UNIVERSITY

Logical thinking is abstract thinking, but the abstract thinking is not necessarily logical. The logical characteristic of mathematics has directly benefited the development of human logical thinking through the mathematic training. The effects are particularly prominent. The education concept in modern China, still inherits some of predecessors' traditions which overemphasize the intuition, practicability and purpose and in which mathematics is generally accepted as a kind of tool to learn and master. More often the meaning of the word "use" in "useful or useless" is the practicability in a particular subject. It does not contain the impact on human development. In fact, mathematics can provide general ideas and methods to observe the world. Mathematics has indispensable impact and value for other human developments, especially for the development of human thinking. Mathematics provides good training for perfect human development.

Therefore, mathematic training should be combined with mathematical knowledge teaching and infiltrating mathematic culture education. Mathematic culture must come into the class (Wan, Zhang, & Chen, 2008). Mathematics and other subjects are actually mutually improved, which causes the mushroom development of mathematics. Its extensive uses are beyond people's imagination. Pragmatism reduces the role of mathematics. Because of overemphasizing practicality, the humanity impact of mathematics is almost neglected. College mathematics teaching is an important part of higher education. Traditional concept of university mathematic

teaching just regards mathematics as "the basic of learning other relevant subjects", which is relatively narrow. It does not see that it is also the foundation of the whole university education and even a foundation for lifelong education.

After students entering university, the capacity to take in, understand and use college mathematical knowledge directly affects the college students' learning on their major and their improvement of overall strength. According to the "Second Five Year Plan", the program has claimed "promoting cultural development and prosperity and enhancing national cultural soft power", reforming and researching on the mathematic teaching mode and method in university, adjusting the personalized courses, broadening the mathematic teaching category and connotation, and stimulating students' interest in natural science especially mathematics. It is helpful to better understanding of natural law and enhances the inner strength of solving natural science problems in order to enhance the mathematic literacy of general engineering college students and cultivate more qualified innovative talents.

"National education reform and development of long-term planning programs" has also clearly required, "university should actively promote culture communication, promote fine traditional cultures and carry forward advanced culture". This fully reflects that our country has deeper requirements for university function.

Mathematics provides methodology basis and technical means from multi angles like thinking and technology, which greatly enriches human culture and promotes the development of human culture. Thus, mathematics is the organic and important part of human culture.

4. AN EFFECTIVE WAY TO INTEGRATE MATHEMATIC CULTURE INTO UNIVERSITY AND ITS SIGNIFICANCE

It has already become the highlight of the contemporary society that we should enhance national citizens' mathematic cultural literacy, especially paying great attention to university education about future talents' quality. Mathematic culture as an important content of national literacy, at the macroscopic level, is the ability to control the national development; at the microcosmic level, is the inner quality and potential ability for individuals to engage in scientific and technological activities. Mathematic cultural literacy refers to the research ability of mathematic science, language level of mathematic science, and the rational spirit reflected by mathematic science which targets at figure and shape ,whose main thinking method is concept, judgment, inference and calculation and whose center is to find truth, virtue and beauty. Nowadays, Mathematic culture literacy is one of the essential basic qualities. Strengthening the education of mathematic culture literacy is becoming the mainstream of modern mathematic education. Therefore, integrating mathematic culture into university education has its important significance.

Some suggestions of integrating mathematic culture into university education:

a. We should change the mathematic learning method of college students, emphasize mathematic communication, and regard mathematics as a powerful, concise and accurate communication method. We should also use mathematic modeling. The present situation of university students' exploratory thinking training remains to be strengthened. It is better that we do the training from two segments: class teaching and course arrangement. Compared with the past curriculum, the current curriculum has made progress and some achievements, but it still leaves much to be desired. Accordingly, it is particularly important that strengthening the mathematic exploratory thinking, cultivating students' developing thinking ability and obtaining some experience and method of researching problems.

b. No formation and development of culture can come true without the specific social and cultural background. Strengthening the construction of mathematic background knowledge in mathematics education of university will enable students to understand the historical background of mathematical knowledge in a certain environment and cultural atmosphere. For example, when teaching polynomial section of advanced algebra, teachers can introduce the masterpiece Jade Mirror of the Four Unknowns written by our Chinese ancient mathematician Zhu Shijie of Yuan Dynasty and then help students deeply understand mathematical knowledge. Let them realize what important contribution the mathematics has made to the human development.

c. We should vigorously carry forward the reform of teaching. Base on the development history of mathematic culture, we should explore new mode and way of meeting the sound development of university mathematic education. Let the students experience the formation and application process of mathematical knowledge, which will better understand the significance of mathematic culture. We should master the necessary basic knowledge and basic skills, develop the awareness and ability of Applied Mathematics, strengthen students' hope and determination of learning mathematics well, encourage students to explore independently and communicate cooperatively, digest the mathematical knowledge relationship earnestly, cultivate students' mathematic cultural literacy and fully enhance the capacity of innovation.

d. Culture influences educational values, educational goals, teaching contents and methods and even the growth of students. Therefore, the construction of teachers who have higher mathematic cultural literacy is extremely important. We should strengthen the teachers' mathematic cultural literacy constantly, study mathematic culture and

university mathematical teaching more deeply, and make great efforts to influence the students really by mathematic culture during the process of learning mathematics.

e. University mathematical education should strengthen the cultivation of mathematic rational spirit. Traditional mathematical education is carried out through mathematical knowledge, which focuses only on mathematics knowledge itself, while rarely involved the rational spirit which are implicated in the knowledge production and the process of development. Of course, paying attention to mathematical knowledge itself is not wrong, which is the most basic requirement of mathematics education. But what we need to do is pay more attention to the cultivation value of mathematical education and pay more attention to cultivate rational spirit of mathematics.

f. We should learn from foreign experience, open mathematic cultural education course and give the students who just got into university a picture of what mathematic development have experienced, which will help the university mathematical education infiltrate into mathematic culture. We should strengthen students to participate in learning the mathematic culture which is to be a complementary of school mathematic teaching and a mainstream of campus culture.

CONCLUSION

After rigorous training in mathematics, students can form an unswerving and impartial quality and form a strict and precise thinking habit, which has positive and profound influence on improving College Students' quality. The soul of mathematic cultural literacy is not ability, but rational spirit which focuses on seeking truth. Its core content is the concern of human existence and value, which is humanist spirits. Mathematics has a profound impact on human spiritual life. Mathematics provides a kind of thinking method and mode and reasonable thinking standard, which open up a way of human development. Mathematic cultural literacy has become a basic quality which contemporary college students must have. The literacy of college students is the future of the country and directly relates to the soft power of university. Thus, university mathematics education should pay attention to not only the system of mathematical concepts or a kind of methods and skills, but should be used as culture media, which will benefit students the whole life.

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