

## Analysis Of Adult Mathematics Teaching Based On Stem Theory

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**Abstract:** In adult education, mathematics is a very important subject, especially for science and engineering majors, mathematics is a basic and important course, directly affect the study of other science and engineering courses. If you can't learn math well, then it will affect the study of other courses. For adult mathematics teaching, under the macro environment of education reform, it is necessary to realize the innovative construction of teaching activities and reconstruct mathematics teaching based on STEM concept. Based on this, this paper firstly analyzes the connotation of SIEM education concept and its influence on adult teaching, then reflects on the existing problems in adult mathematics teaching, and finally proposes innovative measures and methods for adult mathematics teaching based on STEM concept for reference.

Adult education is different from the ordinary full-time education of a form. Adult education is not limited by age and gender. It provides re-education services for people from all walks of life, so that members of the society can continuously improve their professional skills and enrich their theoretical knowledge, so as to continuously improve their comprehensive quality and keep up with the progress and development of the society. As a basic course in adult education, mathematics curriculum is of great help to the overall educational effect. Under the background of educational reform, adult mathematics teaching should also conform to The Times and construct a new educational model so as to improve the educational effect. In recent years, the concept of STEM education has become a new idea to guide the educational reform. Adult mathematics teaching needs to focus on the connotation of STEM ideas and make targeted innovations in teaching activities, so that educational activities can reach a higher level.

### 1. Concept of STEM

#### 1.1. Connotation

STEM, which is an English abbreviation, S stands for science, T for technology, E for engineering, and M for mathematics. The STEM education concept actually contains four core connotations, that is, to cultivate students' scientific, technical, engineering and mathematical literacy. When implementing the concept of STEM education, it is necessary to develop a precise grasp of these four qualities.

Scientific literacy refers to the use of scientific knowledge to understand nature and participate in a series of processes that affect nature, such as physical, chemical and biological means. Genetic techniques in bioengineering, for example, can influence the natural evolution of species, changing their evolutionary direction and biological characteristics through human intervention.

Technical literacy refers to the ability to understand, use, manage and evaluate technology. In science and engineering majors, there are many technologies, and new technologies are constantly emerging. From the perspective of the development of The Times, it is necessary to quickly understand and use new technologies, and can be reasonably managed and evaluated to achieve continuous progress and development of technology.

Engineering accomplishment refers to the design and development of technical engineering, which requires the formation of integrated thinking, the ability to examine and treat specific projects from a macro perspective, and the infiltration of implementation, management and other aspects of work, the formation of engineering thinking.

Mathematical literacy refers to the comprehensive ability of discovering mathematical problems,

thinking about mathematical problems and using mathematical knowledge to solve mathematical problems. Mathematical problems not only exist in the field of mathematics, in many science and engineering majors, there are mathematical problems, how to use mathematical knowledge to solve problems in other majors, this is the concrete embodiment of mathematical literacy.

## **1.2. Teaching Influence**

As for adult mathematics teaching, STEM concept has brought a variety of influences to education and teaching activities, which forces mathematics teaching to realize reform in the new era in order to keep up with the development and changes of The Times. Specifically, the impact of STEM on adult education is mainly reflected in the following aspects. First, impact on the concept of adult education. From the practical point of view, the concept of adult education is more traditional, has not been able to keep up with the development and changes of The Times, and the current educational situation appears disjointed. STEM concept has impacted the current concept of adult education, forcing the realization of innovative changes in the concept, forming a new educational thinking. Second, it affects the teaching mode. At present, the development of adult education is either online teaching or class-based teaching. No matter which mode, it is confined to the state of unilateral explanation, which is not in line with the current educational development trend. The STEM concept puts forward higher requirements for education and teaching, which focuses on the internal cultivation of literacy, which requires adult education to realize innovation in methods and modes to meet the requirements of STEM concept. Third, influence teaching evaluation. Teaching evaluation is an important link to measure the learning effect of students. At present, in adult education, educational evaluation is still limited to the traditional theoretical model, which is either the examination evaluation, or the course design or the writing of the course paper, and the actual work is not connected. The STEM concept emphasizes the ability to solve practical problems. If the evaluation is not related to the actual work, the teaching effect will be low.

## **2. Reflection on the Problems of Adult Mathematics Teaching At Present**

Under the STEM concept, adult mathematics teaching is facing many influences. In such a situation, reflecting on the specific development of adult mathematics activities, we can also find that there are still some problems, resulting in the effectiveness of teaching activities did not reach the ideal state. Specifically speaking, the existing problems are mainly manifested in the following aspects.

### **2.1. Teaching Theorization Ignores the Cultivation of Mathematical Literacy**

Under the STEM concept, students' mathematical literacy is required to be cultivated, because mathematics is the foundation of science and engineering. Aside from the STEM concept, in the current educational reform environment, it is also required to cultivate students' core quality of subjects. So, from this point of view, they're consistent. In the adult mathematics teaching, we should develop the students' mathematics core accomplishment. However, from the current practical point of view, many teachers in the implementation of adult mathematics teaching process, teaching activities are limited to theoretical explanation. Both online teaching and class-based teaching lay emphasis on the explanation of theoretical knowledge and failed to integrate the corresponding core qualities into the classroom. In this way, the direct result is that students' level of mathematics literacy is low, and their awareness and ability of mathematics understanding, problem discovery and mathematics application are weak. The direct result is that although students can master theoretical knowledge, it is difficult for them to make effective use of it in life, which reduces the effectiveness of teaching activities.

### **2.2. The Teaching Activities Are Separated From the Actual Work of Students**

In adult education, many people who participate in learning have formal jobs, which are generally on-the-job learning. They hope to improve their exhibition ability through adult education, so that they can be more competitive in their jobs. Based on the STEM concept, students' scientific

and technical literacy is also required to be cultivated, which means combining teaching activities with students' work practice, integrating theoretical knowledge with practical work, and promoting the synchronous improvement of students' professional quality. However, from the present adult mathematics teaching concrete development will tell, actually has disconnects from the student work actual question. When many teachers are carrying out adult mathematics teaching, they often take books and textbooks as the reference and simply explain the contents of books and textbooks, failing to combine relevant knowledge with specific work. For adults in civil engineering, for example, math learning should be combined with calculations in civil engineering to improve their engineering literacy. However, this is not done well and needs to be improved.

### **2.3. The Traditional Effect of Teaching Evaluation Is Not Good**

In recent years, the ministry of education has made it clear that higher education should be strictly regulated, that evaluation standards should be raised, that students should be allowed to leave school at a higher level, and that time and credit mixing should be strictly cracked down on. Adult education belongs to the constituent parts of higher education and should also pay attention to the requirements of strict admission and strict withdrawal. For mathematics teaching, we should adhere to strict, set high standards in the teaching evaluation stage, strict evaluation of students. However, from the practical point of view, the current adult mathematics teaching in the teaching evaluation requirements are not high, and tend to traditional theoretical model, which leads to the inability to accurately measure the relevant mathematical literacy or engineering literacy of students, students through mathematics learning on the improvement of professional ability, it is not clear. Therefore, it is urgent to change the current evaluation mode and build a more reasonable evaluation system based on STEM.

## **3. The Concrete Strategy of Innovating Adult Mathematics Teaching Based on STEM Concept**

Under the guidance of STEM concept, the innovative construction of adult mathematics teaching can be based on the existing problems to carry out innovative construction of mathematics teaching activities, so as to promote the innovative development of mathematics teaching.

### **3.1. Innovation of Adult Mathematics Teaching Based on Mathematics Literacy**

Under the STEM concept, it is very important to cultivate students' mathematical literacy, which is related to their professional development. At present, adult mathematics teaching focuses on theory and ignores cultivation of literacy, which leads to uneven development of students and low level of mathematical literacy. Therefore, it is necessary to integrate relevant mathematical literacy into the adult mathematics teaching to effectively cultivate students, so as to make the effect of adult mathematics teaching more ideal. First of all, teachers need to form an understanding of the connotation of mathematical core accomplishment and understand the specific composition of mathematical accomplishment. To put it simply, mathematics literacy includes mathematics application, innovation consciousness, logical thinking and other qualities. For these qualities, mathematics teachers should form an understanding and pay attention to the integration of teaching. Secondly, in the process of teaching, we should integrate mathematical literacy into it and form a combination with theoretical knowledge. For example, for the accomplishment of logical thinking, it is necessary to construct corresponding thinking activities in the classroom, so that students can think in a specific mathematical situation and exercise their logical thinking. For another example, with a lower awareness of innovation, students can build a multi-solution activity based on specific mathematical problems in teaching, guide students to think creatively from different perspectives, and find out different problem-solving strategies.

### **3.2. Optimize Adult Mathematics Teaching in Combination with Work Practice**

In addition to the cultivation of students' mathematical literacy, adult mathematics teaching should also pay attention to the cultivation of scientific literacy, engineering literacy and other

qualities. Because under the STEM concept, students are required to develop these qualities. For mathematics teaching, to cultivate students' engineering and scientific literacy, it is necessary to combine students' actual work to construct teaching activities. Adult education students, are in a specific job position, many are science and technology posts, there is a certain demand for mathematical knowledge. Therefore, in teaching activities, first of all, cases can be introduced from students' work, combining with specific work cases to analyze and explain mathematical knowledge, such as mechanical calculation in civil engineering, calculation in mechanical design, etc., combining with these cases to analyze mathematical knowledge, to maintain the combination of mathematics teaching and practical work. Secondly, we should construct mathematical practice based on the actual work. Mathematics teaching cannot be limited to theoretical explanation, but also need to pay attention to practice, exercise students' mathematics ability. Therefore, based on the actual work, some specific scenarios can be designed for students to use mathematical knowledge to solve problems.

### **3.3. Optimize Teaching Evaluation to Exercise Students' Professional Quality**

In the adult mathematics teaching, besides the knowledge explanation and the practice, also needs to pay attention to the teaching evaluation this link. Teaching evaluation is to evaluate the learning effect of students and understand their shortcomings in learning. Mathematics evaluation of adult students should not be limited to theoretical evaluation, but should pay attention to the effective use of mathematics knowledge by adult students in practical work. Therefore, for teachers, it is necessary to break out of the traditional models such as theoretical examination and curriculum design, take practical work as the guide, design a practical evaluation model in combination with students' specific work, and evaluate students' mathematical learning effect by practical tasks. After the evaluation, it is also necessary to optimize the subsequent mathematics teaching according to the problems found, and strengthen the weak links in students' learning, so as to achieve better results in mathematics teaching.

## **Conclusion**

In adult mathematics teaching, it is necessary to pay attention to the requirements of education reform in recent years and reflect on the deficiencies of current teaching activities based on the STEM concept. In view of the current problems, we should grasp the connotation of STEM concept, innovate and construct the methods and modes of mathematics teaching, integrate relevant qualities into it, optimize the teaching according to the actual work of adult students, improve the evaluation, and comprehensively promote the improvement of students' professional qualities.

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