

Research on higher vocational mathematics teaching based on core literacy cultivation

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Abstract: In order to improve the teaching quality and efficiency of vocational education, it is necessary to cultivate students' core competencies. Mathematics is a fundamental course in higher vocational education teaching, which is of great significance for cultivating students' logical thinking ability and enhancing their future scientific and technological research and innovation work. With the continuous reform and development of education and teaching, the vocational mathematics should focus on improving students' core literacy, and through mathematical thinking and literacy training, cultivate students' ability to solve practical problems. This article is based on the current situation of mathematics curriculum teaching in vocational colleges. By elaborating on the characteristics and functions of mathematical core literacy, analyzing the importance of core literacy, and proposing teaching strategies based on improving core literacy, we aim to cultivate talents who adapt to the new era through reasonable educational model.

1. Introduction to mathematics core literacy in higher vocational education

In recent years, the overall strength of higher vocational education in China has significantly increased, the quality of talent cultivation and the level of service to the economy and society have significantly improved, and gradually completed the development process from scale development to connotation construction. With the change of people's attitudes, more and more students choose to study in vocational colleges. Vocational colleges play a crucial role in vocational education in China. As the main base for cultivating technical talents, the government has increased investment in the construction of vocational colleges and encouraged universities to introduce advanced educational resources and equipment. Teaching basically adheres to the educational philosophy of "emphasizing majors but neglecting foundations", hoping that students can find employment as soon as possible after graduation, while neglecting education in basic subjects, resulting in a serious shrinkage of basic education courses.

The core literacy ability refers to the character and quality that students should possess to achieve social development and personal value, which plays a very important role in the current international education industry and is also the main research direction of the new round of teaching

reform. At present, high school mathematics teaching has conducted theoretical research and practical verification on core competencies, and has achieved certain theoretical research results. There is still a certain gap in theoretical research and practical verification on how to cultivate the core literacy of college students. Advanced mathematics, as one of the most important public basic courses for science and engineering majors, has a high degree of abstraction and logic, thus increasing the difficulty of learning. The teaching of mathematics has unique characteristics and plays an important role in cultivating students' core competencies. Strengthening the study of mathematics can exercise students' scientific thinking ability and improve their ability to solve practical problems. Furthermore, mathematics not only plays a role in calculation and reasoning in daily life, but also permeates various aspects of society as a language of communication. With the rapid development of artificial intelligence big data, it is even more necessary for people to have the ability to obtain and process data. These are inseparable from mathematical literacy such as logical thinking and scientific spirit formed in mathematics teaching, indicating that core literacy plays a crucial role in higher mathematics teaching.

In recent years, many educators have conducted in-depth research on the reform of vocational mathematics teaching under the core literacy. Jin analyzed the connotation and basic characteristics of the core literacy of mathematics in higher vocational colleges, and discussed the reform of mathematics curriculum based on the cultivation of core quality[1]. Li obtained the basic information on the cultivation of mathematical core literacy in vocational colleges through questionnaire surveys and random interviews. And based on this, he formulated the implementation path for cultivating the core mathematical literacy of vocational college students[2]. Qu studied the higher vocational mathematics teaching scheme based on core literacy and analyzed the importance of higher vocational mathematics core literacy ability[3]. Yang studied the teaching plan of vocational mathematics based on core literacy and analyzed the importance of core competencies in vocational mathematics[4]. Wang believed that vocational colleges should conduct practical research on mathematics teaching from aspects such as mathematical thinking, mathematical application, and mathematical information literacy to improve students' ability to solve practical problems and comprehensive literacy[5]. Yao believed that in mathematics teaching in higher vocational colleges, teachers should improve students' comprehensive ability from the perspective of solving practical problems, cultivate students' relevant mathematical skills such as abstraction, modeling, operation and reasoning, and constantly innovate and explore to improve their own mathematical level[6]. Wang studied the relationship between vocational mathematics curriculum standards and core competencies, and processed information resource data related to curriculum standards through literature review and content analysis methods[7]. This article analyzes the current situation of higher vocational mathematics, points out the importance of mathematical core literacy ability, and proposes strategies to improve core literacy ability.

2. The current situation of mathematics teaching in higher vocational education

The majority of students admitted to vocational colleges have poor scores in the college entrance examination, and many students have difficulty understanding and mastering basic knowledge, resulting in low motivation for learning. Some students believe that entering vocational colleges is just about learning a skill, and after working, they hardly ever use mathematics. Over time, it leads to an incorrect learning attitude, a lack of interest in learning, and even a dislike for mathematics. In addition, the current lack of self-control among students makes it very common to play with mobile phones in the classroom, and there are very few students who listen attentively.

There is a phenomenon of marginalization in mathematics teaching in vocational colleges, where vocational colleges overemphasize “vocational technology” by emphasizing the cultivation of

practical abilities while neglecting the cultivation of basic education and core competencies. In addition, the average age of mathematics teachers is relatively old, with age structure gaps, fewer young teachers, and limited opportunities for training and visiting, resulting in many problems in the mathematics teacher team. Moreover, due to the large number of students in vocational colleges and the need for more teachers, schools will recruit some temporary substitute teachers, most of whom are only to complete teaching tasks, resulting in unsatisfactory teaching results. Teachers lack in-depth research on the correlation between professional knowledge and mathematical knowledge, and cannot effectively integrate mathematical knowledge with professional knowledge; most mathematics teachers in vocational colleges have low ability to use mathematical modeling to solve problems, resulting in a lack of integration between teaching and practical problems; the application ability of information technology is not strong and cannot fully utilize information technology to serve teaching. The research ability of teachers in textbooks is insufficient, and teaching only focuses on imparting knowledge points without emphasizing the cultivation of students' core mathematical literacy.

3. The direction of core literacy in higher vocational mathematics

Mathematics is one of the fundamental disciplines and a mandatory subject for various entrance exams. Therefore, mathematics teaching is an important way to cultivate students' core literacy. Mathematics teaching is progressive, and the teaching content requires increasingly high levels of students' abilities in various aspects. The effective combination of vocational mathematics and core literacy can facilitate the cultivation of core literacy, enabling students to have the ability to use mathematical knowledge to solve practical problems. Teachers can rely on the combination of numbers and shapes to guide students to change their thinking patterns and improve their innovative abilities. The teaching goal of vocational colleges is to cultivate talents with high quality, practicality, quality application, and skills. In addition, in order to carry out vocational mathematics teaching under the background of core competencies, it is necessary to have an understanding of the educational requirements of the new curriculum reform and the current situation of vocational mathematics teaching. Higher vocational colleges should plan the teaching mode of higher vocational mathematics and improve the teaching loopholes according to the concrete performance of the core quality, so as to ensure that the core quality of students can be effectively cultivated.

4. The implementation path of cultivating mathematical core literacy for vocational college students

4.1 Construction of teaching staff

As a guide for students' learning and life, teachers play a very important role in cultivating students' core mathematical literacy. The improvement of the quality of the teaching staff is essential for mathematics teaching in vocational colleges under the guidance of core competencies. A strong and stable teaching staff can improve the quality of mathematics teaching. Teachers should change their teaching concepts and focus on improving students' core mathematical literacy during the teaching process. Only by fully understanding and identifying with core competencies can students truly be influenced. In addition, more math teachers can be recruited to reduce the number of substitute teachers.

4.2 Redesign course content

To address the widespread emphasis on skills and neglect of core literacy in vocational colleges, teachers need to redesign their teaching content to truly achieve the structuring and

contextualization of knowledge. With the comprehensive promotion of the new curriculum reform, teachers should extend and expand the scope of mathematical knowledge, integrate mathematical knowledge with other disciplines, connect them with reality, and present them in a graphic and textual manner, in order to further improve the quality of teaching. The case studies of mathematics textbooks in vocational schools should be closely related to society, production, and life, and the materials should be illustrated and illustrated. When compiling the textbook, teachers can give some practical application examples to make the textbook widely applicable and interesting, enhance students' interest in learning mathematics, and improve classroom teaching effectiveness.

4.3 Reform of teaching methods

With the new round of curriculum reform, teachers should change their traditional teaching concepts, start from reality, and cultivate talents that meet the needs of society and the new era. Traditional teaching emphasizes exam taking, while teachers focus on imparting knowledge points. This simple explanation and induction teaching method can easily cause students to develop passive learning emotions, leading to a lack of initiative in autonomous learning, greatly hindering the development of students' imagination and creativity. In the information age, only talents with innovative awareness, competitiveness, and sustainable development can adapt to social development. When imparting knowledge, teachers should not only be limited to the content and problems in textbooks, but also be good at exploring the hidden content in textbooks, explaining students' mathematical culture, mathematical ideas, and mathematical methods, and promoting students' all-round development.

5. Conclusions

Core literacy provides more prominent and focused educational goals for the teaching reform of vocational mathematics courses, and points out the direction for the reform of vocational mathematics courses. Teachers should conduct teaching practice research guided by students' core competencies in teaching, timely innovate the teaching staff, textbook content, teaching methods, etc., explore new educational models, guide students from simple knowledge memory to analytical and creative thinking abilities, and ultimately achieve the improvement of core competencies and overall qualities of vocational college students.

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