

Analysis on the Integration of Mathematical Modeling Thoughts in Higher Vocational Mathematics Teaching

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Keywords: Higher vocational mathematics, Mathematical modeling thoughts, Teaching activities

Abstract: This article first introduces the current state of mathematics teaching in higher vocational education, and then analyzes the specific significance of incorporating mathematical modeling thinking into future mathematics teaching in higher vocational education. It also introduces issues that need attention when incorporating modeling thinking into future higher vocational mathematics teaching. A few specific methods are hoped to help the development of higher vocational mathematics in the future.

1. Introduction

In the teaching of mathematics in higher vocational colleges, the scientific and reasonable integration of modeling ideas can help higher vocational students to solve mathematical problems more accurately and quickly, and can also enable certain logically-knowledgeable knowledge to be carried out intuitively and simply. Show, and then improve the quality and efficiency of students' learning.

2. Mathematics Teaching Status in Higher Vocational Colleges

Judging from the current situation, the vocational college's mathematics learning efficiency is low, and the students' learning enthusiasm is low. The reasons for this situation are as follows. First, from the perspective of the characteristics of mathematics itself, the subject of mathematics itself is difficult. Learning mathematics requires a sufficient amount of knowledge. Mathematics has a certain degree of abstraction. In the specific learning process, the logical ability is to learn mathematics and use mathematics. Premise. Mathematics itself is difficult, and the requirements on students are high. This causes the students' learning mood to be low, and the quality of learning is not high. Second, the students' enthusiasm for learning needs to be strengthened, and the efficiency is low. In some cases, the teaching mode and teaching method have not been adjusted according to the specific learning conditions, so the teaching quality of the classroom cannot be effectively improved, and the learning atmosphere and enthusiasm of the students cannot be effectively mobilized. Mathematical modeling thinking should allow teachers to guide students to think practically when teaching and allow students to associate abstract mathematical theory with various phenomena in life. This requires students to supplement some basic physics, chemistry, and Language knowledge. Many vocational colleges in China have not paid much attention to mathematical modeling thoughts, and their practical effects are unsatisfactory [1].

3. Significance of Incorporating Mathematical Modeling Ideas into Higher Vocational Mathematics Teaching

Among mathematical theoretical knowledge and practical problems, modelling plays an important role as a bridge. To solve problems in life based on modeling, we must first take the principles and methods of thinking in mathematics as the basis and put student learning at the center. To allow students to learn knowledge through problem solving, to cultivate and improve the level of problem solving and abilities of higher vocational students, to effectively stimulate students' thinking, to firmly innovate in students' minds, and to use mathematical modeling. Applying the

theoretical knowledge learned in the classroom to real life, allowing students to directly feel the charm of mathematics and the value behind mathematics in the process of learning, re-stimulating students' enthusiasm and interest in mathematics, and also improving students' use of knowledge and The ability to use mathematics.

3.1 Cultivate Students' Logical Ability and Divergent Thinking Consciousness

In mathematical modeling, students need to make a brief analysis of the mathematical knowledge and mathematical ideas they have learned, effectively use their imagination, combine their own creativity and divergent thinking ability, and finally conclude a model that can explain actual problems in detail. Then use computer technology and mathematical theoretical knowledge to carry out systematic calculations, and finally draw conclusions. Through past practice, we can know that some problems and phenomena with weak or no connection in real life, after using mathematical modeling, can finally get basically the same mathematical model. This requires students to flexibly use the knowledge of classroom learning in life. To sum up and summarize, to be good at finding special from the general, to find commonality from the special, in addition, students must also cultivate themselves to be innovative and not satisfied with the good quality of the status quo.

3.2 Cultivate and Increase Students' Interest in Learning Mathematics

With the progress of society, technical talents have higher requirements in the society, and they require higher mathematical literacy. However, many vocational students currently have misunderstandings about mathematics and do not recognize them well. They believe that mathematics is an example in the textbooks and a threshold for further studies. Some people even think that mathematics has no practical purpose. Having higher vocational student's use mathematical modeling can play a role in the change of students' current thinking. In the process of learning modeling, higher vocational students will use the learned mathematical knowledge many times, and will also link the mathematical knowledge with the actual situation. . Throughout the study, higher vocational students can intuitively feel the real value of mathematics, which in turn makes students have a strong interest in mathematics.

3.3 Improve Students' Ability to Use Computers

In today's society, the use of computers is becoming more and more widespread. With the advent of the era of big data and the development of science and technology, many multifunctional and comprehensive mathematical software have been developed, making many complicated and complicated mathematical problems simple and clear. More and more fields are based on the use of computers as a prerequisite for development. In the modeling and solving of mathematical models, there are many links that need to be calculated, so the use of computers and mathematical software is very necessary. Students using mathematics for modeling will also improve their proficiency in the use of computers and mathematical knowledge, and then improve the level and ability of students to use computers to solve mathematical problems, giving students an advantage in future competition.

3.4 Improve Students' Ability to Solve Practical Problems

The mathematical purpose of mathematical modeling is to use models to understand and solve practical problems in reality, to achieve the combination of theory and practice. Using modeling can break the previous stereotyped understanding of mathematical "logic only" and "theory". Teachers first introduce modeling ideas into teaching, linking mathematical theoretical knowledge with practical problems, allowing students to change their misconceptions that "math has nothing to do with life," and help students correctly understand the meaning and function of students. Mathematical modeling uses mathematical language and methods to create a tool that solves practical problems. The reasonable use of modeling ideas by students will definitely improve the level and ability to solve problems in life.

3.5 Promoting the Reform of Mathematics Teaching

The new curriculum standard clearly states that school education should improve students' ability to solve problems. Mathematical modeling ideas and the new curriculum reform ideas coincide with each other, and they are integrated into the mathematical teaching of higher vocational colleges. On the one hand, they can help students have an accurate understanding of mathematics and enhance their learning enthusiasm to promote the development of mathematics; on the other hand, it can effectively inherit the concept requirements of the new curriculum reform and innovate to ensure the steady development of mathematical teaching reform.

4. Problems Needing Attention in the Integration of Mathematical Modeling Thoughts in Higher Vocational Mathematics Teaching

4.1 Define the Role of Mathematical Modeling in Teaching

In the teaching of mathematics in higher vocational colleges, the role of teaching should be clearly defined, and the teaching of mathematics should be mainly supplemented by modeling. Mathematics teaching still occupies a dominant position. Modeling is only to link cases in life with theoretical knowledge, to serve teaching, to appropriately enhance the interaction of teaching, and to cultivate students' passion and interest in mathematics. Therefore, the status of the two cannot be confused. Teachers should pay more attention to the progress of the two. They must not allow the modeling ideas and methods to exceed a certain range. Once they exceed a certain range, it will seriously affect the students' accumulation of theoretical knowledge of the textbook. Moreover, the premise of using the modeling ideas is that the students have fully and firmly grasped Theoretical knowledge.

4.2 Introduce Appropriate Mathematical Modeling Cases

In classroom teaching, modeling cases should be properly quoted. Teachers play an important role in the classroom. From the level of curriculum knowledge, teachers need to teach students certain theoretical knowledge at the appropriate time. Teachers also teach knowledge while also You can adjust the reference to the modeling case according to the student's response, so that the progress of the lesson is more in line with the acceptance of the students. From the level of citing the modeling case, quoting the modeling case at the appropriate time can better guide the student's learning. Learning does not happen overnight, it can only be done step by step.

4.3 Pay Attention to the Connection between Teaching Content and Mathematical Modeling

In the study of mathematics, students must be based on book knowledge and theory. The knowledge in the book is carefully compiled by many experts and scholars over the years. Many wisdoms are condensed in the book. When the modeling ideas are introduced, they must conform to the curriculum. The actual requirements not only meet the rules and requirements of the curriculum, but also allow students to preview in advance to ensure that they do not waste a lot of time in thinking about mathematical modeling and strengthen the knowledge conveyed by the book itself. The reasonable connection between modeling and teaching can mobilize students' enthusiasm and enthusiasm for learning, and then expand thinking, associate more knowledge, and stimulate students' creativity.

4.4 Focus on the Particularity of Mathematical Modeling

Mathematical modeling has its particularity. When introducing modeling ideas, teachers must choose content that students can quickly understand, and it must be related to life, and it must be practical. If the introduction of too difficult content, students cannot understand in a short time, it will affect the learning of the entire course, introduce simple content for students to accept, let students recognize the simple side of mathematics, achieve the purpose of easy learning, and cultivate student learning enthusiasm. The content to be introduced must be lifelike. Solving problems encountered in life through mathematics can deepen the impression of students and

stimulate learning interest. The content also needs to be interesting, and fun can mobilize the classroom atmosphere and the enthusiasm of the students, allowing students to learn in a relaxed atmosphere.

5. Ways to Incorporate Mathematical Modeling Thoughts into Higher Vocational Mathematics Teaching

The main purpose of higher vocational teaching is to transfer skilled talents to the society. Such talents generally have one or more technologies. After graduating into work, students need to use the knowledge and professional skills they have learned before, even in many aspects. Most of the difficult problems can be solved by modeling. Today's society is an information society. When cultivating talents in higher vocational colleges, they must base on social needs and cultivate comprehensive applied talents. The pressure on schools can be imagined. It is necessary to incorporate mathematical modeling reasonably and timely into the teaching of higher vocational mathematics.

5.1 Construct a Scientific and Reasonable Vocational Mathematics Teaching System and a Relatively Complete Syllabus

The syllabus is an effective voucher to ensure that the teaching quality is qualified, and it is also the basic basis for the school to train talents. It is the basis for later teaching tasks and teaching schedules. Formulating scientific and reasonable teaching plans and setting appropriate teaching content are conducive to students' enthusiasm for learning. Excite [2]. Taking the responsibility of students as the original intention, higher vocational colleges should focus on the specialties of different majors and the direction of talent training, and concentrate the professional teachers to develop teaching content, plans, and schedules to form a mathematical teaching system with professional characteristics. Set up public courses and elective courses according to the specific specialty.

5.2 Prepare a Series of Textbooks with Distinctive Characteristics of Higher Vocational Education, and Integrate the Cases and Mathematical Modeling Ideas and Methods into the Textbooks.

Teaching materials are indispensable in any teaching. Teaching materials play an important role and guide the basic direction of teaching. Higher vocational colleges cultivate technical talents, and mathematical modeling is also a practical activity. The teaching materials of higher vocational colleges should be based on production practices and meet the needs of social posts. Education innovation should be the goal to cultivate and improve students' Comprehensive quality, the methods and ideas of mathematical modeling are expressed, in the compilation of textbooks, it is necessary to appropriately strengthen the practicality and innovation to meet the basic needs of vocational colleges to cultivate skilled talents.

5.3 In Mathematics Teaching, the Use of Clear and Interesting Cases Helps to Enhance Students' Interest and Awareness of Learning Mathematics

In specific mathematics teaching, every unfamiliar formula, theorem, and concept must be explained with examples that are obvious in daily life, and then guide students. In the explanation of specific knowledge points, try to use examples that are closely related to the knowledge point and closely related to the students' majors to illustrate, so that students fully understand the mathematical problems walking in every corner of life, let them know that mathematics is everywhere. Mathematics is actually a model that uses symbols to describe the world. Mathematics is not just a boring theoretical derivation. It has no practical meaning, such as WeChat red envelopes, loan repayment and other issues. They can not only allow students to learn mathematical knowledge, but also allow students to use mathematics Connect with real life and have fun [3]. The application and promotion of mathematical modeling is conducive to the cultivation and improvement of students' mathematical application ability, and can be comprehensively promoted

in higher vocational colleges.

5.4 Perform Mathematical Experiments to Develop Students' Practical and Brain Abilities

A very critical step in mathematical modeling is to use the computer to solve the model. In the early stages of modeling, mathematical experiments played a very important role. Because the use of mathematical experiments can allow students to understand the mathematical concepts inside and outside more intuitively, allowing students to create a sense of simplicity in the learning of mathematics, so that students can more actively participate in mathematical experiments. In modeling, using computers to interact with the learning environment, students can use their assumptions in their brains as a basis to verify that their ideas are correct. Adopting such a learning method can effectively improve students' learning initiative and enthusiasm. In addition, it can also cultivate students' own observation ability, thinking ability and induction ability, liberate students' hands, and effectively and steadily improve the overall comprehensive quality and Hands-on ability.

5.5 Develop Students' Ability to Use Mathematics in Teaching by Using Mathematical Modeling

Using mathematical theoretical knowledge to solve practical problems in life, using mathematics to improve work efficiency is the fundamental task of mathematics teaching in today's vocational colleges, and it is a very important part of mathematics teaching in current vocational colleges. It can make reasonable and effective use of mathematics is a great challenge to students' ability. Constructing models and effectively using mathematics involves mathematical calculation methods, spatial imagination, and thinking modes, which are very complicated. In addition, mathematical modeling has now been applied to other industries, allowing it to continue to expand its scope of application, which deserves our attention.

6. Conclusion

In summary, the ultimate purpose of education is to promote the improvement of students' various abilities. In today's society, higher vocational education is an important branch of our education system, and we cannot ignore the important role it plays. The introduction of modeling ideas in mathematics teaching in higher vocational colleges can effectively improve the quality of students' classroom learning and their ability to use them outside the classroom, as well as help students develop their comprehensive practical ability.

Acknowledgement

Fund Project: The research on the improvement of Gansu Province's innovative ability in higher education in 2019 "Research on the relationship between the development of characteristic agricultural industries in Longnan and county-level economic growth based on the VAR model" (Project Number: 2019B-225).

References

- [1] Zhao Jiaqi (2017). Humble Opinions on How to Integrate Modeling Thought into Higher Vocational Mathematics Teaching [J]. *Cai Zhi*, no. 34, pp. 5.
- [2] Zhou Sujing (2017). Research on the integration of Zhang Xiuying's mathematical modeling thinking method into the teaching reform of higher vocational colleges [J]. *Journal of Shangqiu Vocational and Technical College*, no. 3, pp. 81-83.
- [3] Li Jianjie, Wang Nan (2017). Research on the application of mathematical modeling ideas in higher vocational mathematics teaching [J]. *Mathematics Learning and Research*, no. 3, pp. 11-14.