# On the Ability-Centered Innovation of Mathematics Teaching in Higher Vocational Colleges

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**Abstract:** With the continuous development of education in China, mathematics teaching in higher vocational colleges should focus on ability building and innovate its teaching methods, so as to better improve students' mathematical ability and enable students to develop stably. To improve students' ability in mathematics teaching in higher vocational colleges can broaden students' horizon, help students observe life and analyze related problems from the perspective of mathematics, have a deeper level of cognition for mathematics, and use mathematics knowledge to solve practical problems in life. This paper studies the significance of the ability-centered innovation of mathematics teaching in higher vocational colleges, interprets the status quo of mathematics teaching in higher vocational colleges, and raises the strategy of ability-centered innovation of mathematics teaching in higher vocational colleges, so as to provide reference for relevant researchers.

At present, influenced by the reform of education, the reform of mathematics in higher vocational colleges has attracted more and more attention. As an important base for cultivating applied talents, higher vocational colleges not only need to improve students' mathematical thinking, but also need to equip students with mathematical ability in the process of mathematics teaching, so as to meet the needs of social development in the future development. However, it can be seen from the current practical situation that there are still some problems in mathematics teaching in higher vocational colleges. It is of great significance to analyze the problem and develop ability teaching.

## 1. Significance of Mathematics Ability Building in Higher Vocational Colleges

In terms of teaching nature, higher vocational colleges are to cultivate high-quality applied talents. The purpose of mathematics education is to equip students with professional knowledge as well as ability, which is embodied in four aspects. First, moral education value. The scientific attitude of professional accomplishment in mathematics teaching has an educational function for students. Second, recognition value. Mathematics teaching can improve students' thinking ability. Third, aesthetic education value. Mathematics can effectively enhance students' aesthetic appreciation ability.[1] Fourth, practical value. Teaching tools and application are important contents of mathematics teaching in higher vocational colleges. Application consciousness is the potential factor for ability building of students, which is of great value. Ability is the basis for the development of application consciousness. Students and adults think differently about mathematics and learning contents. Under the influence of their own thinking and teachers, students need to use their own knowledge to solve corresponding problems and actively learn new knowledge to form their own cognitive structure. With application ability, students are able to form their own mathematical thinking, so as to stimulate their initiative in learning and the ability to use mathematics to solve corresponding problems. The application of mathematics knowledge has corresponding effect on students innovation and abstraction ability, which will build a virtuous circle for students to acquire knowledge and cultivate their abilities.[2]

## 2. Status Quo of the Ability-Centered Math Teaching in Higher Vocational Colleges

Higher vocational students are mostly less advanced students. Without clear understanding of mathematics concepts and principles, they suffer from poor calculation ability, which leads to contradict emotions to mathematics. Higher vocational students determine the value of various subjects based on their own value. In the face of the current employment pressure, higher vocational students do not pay too much attention to the corresponding subjects that are not closely related to their majors. As a result, mathematics is not paid attention to by students to a certain extent and is not effectively applied in real life. [3] As time passes, students will resist mathematics, and teachers will not be able to obtain the ideal teaching effect.

From the teaching method and content, the current higher vocational mathematics teaching is mostly based on calculus and mathematical statistics, which feature too much definition and formula but less application scenario. Most of its teaching materials are developed in accordance with the secondary vocational school teaching materials, which lack corresponding application of knowledge. Many teachers still use traditional teaching methods, without taking students as the main body for teaching, nor following the requirements of the current market for guidance. In addition, mathematics evaluation is also important. The mathematics course exam of higher vocational college is written test. Some students can pass the exam only by reviewing before the exam, which cannot effectively reflect the actual ability of students.

## 3. Ability-Centered Innovation of Mathematics Teaching in Higher Vocational Colleges

### 3.1 Innovating Teaching Resources

The mathematics teaching in higher vocational colleges should be based on the construction of overall teaching resources, targeted at professional services and technologies, develop multiple high-quality teaching resources, study the professionalism of courses, focus on the relevant teaching content that can inspire students, and construct the teaching system of teachers, students and higher vocational colleges. Fundamentally speaking, the construction of teaching resources in higher vocational colleges can be divided into three aspects: general fundamental materials, professional application materials, and quality expansion materials. We should analyze each of these aspects in depth and incorporate ideas for solving practical problems. When constructing the public fundamental module and professional application module, we should carry out according to the majors and vocational positions of higher vocational students. Professional cases should be the first to think. [4] In order to better improve students' ability, it is necessary for them to collect relevant mathematical materials and use mathematical concepts and methods to solve mathematical cases. Second, animation materials. Teachers should build mathematics models through animation and information technology to help students understand mathematical knowledge in a more intuitive manner. Third, application cases. Teachers should come up with practical application cases according to the major and learning unit. In the aspect of quality development, culture and technology should be effectively integrated. Teachers should improve students' mathematical ability according to their actual situation. Because mathematics is an applied subject. Therefore, software can be used to reflect its practical means, to build resources that can meet the learning needs, and to help students better improve their mathematical ability.

### 3.2 Constructing Course Guidance System

Mathematics teaching in higher vocational colleges should start from teaching practice and better guide students to learn mathematics through the construction of guidance system. [5] First, when introducing the course, teachers should select relevant issues and cases known by students. Secondly, when teaching the teaching content, teachers should be able to make reasonable use of multimedia and corresponding mathematical software and use more vivid illustrations to impress students, so as to improve their mathematical abstraction ability and apply theoretical derivation appropriately in this process. Through the application of multimedia and corresponding software,

teachers can better solve mathematical problems, reduce students' fear of mathematical problems, better improve students' mathematical learning confidence, and thus improve students' mathematical ability. In addition, in view of the individual differences of high vocational students, we should pay attention to the stratified guidance in the teaching process. For students with strong ability, we should strengthen the target guidance. For the students with weak ability, it is necessary to develop an incentive learning program, so as to stimulate students' learning confidence.

### 3.3 Enriching Curriculum Application System

According to the mathematics course of higher vocational college, we should be able to start from the practical and module to cultivate students' application ability, so that students can use mathematics knowledge to effectively solve the problems in life. On the basis of clarifying the value of mathematics, students can be more willing to learn mathematics and love mathematics to acquire ideal mathematical learning ability.

### 3.4 Constructing multi-application Teaching Method

Through the experimental class, students can not only have an intuitive understanding of abstract knowledge, but also better stimulate students' ability to explore problems actively and apply the theory to practice. [6] As for experimental teaching method, it is different from classroom teaching method. In the teaching process, it pays more attention to the three aspects of direct imagination, conjecture and test results, and pays more attention to the diversified exchange of information. In the process of the experiment, students should be able to actively maintain the learning enthusiasm, effectively explore mathematical laws, and improve their mathematical ability through the effective use of mathematical knowledge.

First of all, through the application of relevant software, teachers can let students understand the mathematical phenomenon in the mathematics curriculum of higher vocational colleges; understand the specific application of mathematical ideas and methods. Teachers use case references to show the way to solve practical mathematical problems with the knowledge and guide students to independently solve problems by applying relevant software and knowledge. [7] Secondly, teachers should also be able to provide students with the corresponding extracurricular practice, through such a way to help students to be able to apply mathematical knowledge in real life and effectively solve practical problems. In the construction of mathematical model, it is necessary to put it into the whole mathematics teaching, so that students can conduct research based on practical problems, and build mathematical models based on world problems, and finally get the answers to solve practical problems. In order to improve students' ability in mathematics teaching activity, teachers need to focus on enabling students to use computer software to build mathematical models. Teachers can ask students to analyze actively according to their major and cases. For example, calculus can be combined with multistep electricity price, so that students can fully understand related knowledge. In addition, schools can also carry out mathematical modeling competitions, and the specific competition mode should be able to be carried out in accordance with the requirements of China's mathematical competition, so that students can better obtain ideal learning effects in participating in relevant activities. [8] Finally, in view of the lack of self-control of students in vocational colleges, corresponding methods should be adopted to improve students' self-control ability. From preview to homework, supervision should be carried out to reflect students' learning effect from multiple aspects. Teachers should help students solve problems they face in a timely manner to improve their mathematical ability effectively.

## 4. Conclusion

In a word, the mathematics teaching is key to training talents in higher vocational colleges. In order to make mathematics teaching more smoothly and give full play to its own value, it is necessary to carry out mathematics reform actively, realize comprehensive ability cultivation, enrich mathematics teaching content and optimize mathematics teaching methods, so as to effectively enhance students' awareness of mathematics application and mathematical ability. This

is not only the development trend of mathematics teaching in higher vocational colleges, but also the important requirement of the society for higher vocational colleges. It is necessary to attract the attention of higher vocational colleges and put all aspects into practice actively. Only in this way can higher vocational colleges develop students stably and provide more talents for the society.

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