Experimental Research on Hierarchical Mathematics Teaching in Higher Vocational Education Based on Technology and Culture

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Abstract: With the development of higher vocational education and the continuous expansion of enrollment scale, the quality of higher vocational students is uneven, the gap between high and low is very large, and the difference of students' knowledge level is particularly prominent. Therefore, based on technology and culture, the author carries out research on the stratified teaching experiment of mathematics in higher vocational colleges. Relevant research shows that applying the layered teaching method in higher vocational mathematics teaching can effectively overcome the contradiction between teaching content and students' hobbies. In addition, to improve the student's knowledge level, close the gap between students. Moreover, it effectively solves the contradiction between the inherent defects of the class teaching system and the teaching of students in accordance with their aptitude, and injects new vitality into the teaching of higher vocational education.

1. Introduction

With the increasing demand for talents in the country, China's education industry has also developed vigorously, and various colleges and universities have implemented enrollment expansion in order to cultivate more practical talents for the society [1]. Through students' active participation in classroom teaching activities, they form the ability to independently acquire knowledge, use knowledge creatively, solve practical problems, and have good personality and personality [2]. The adoption of unified teaching content and teaching objectives has been unable to adapt to the improvement of various students. Higher vocational education is to cultivate high-level practical talents who have certain theoretical knowledge and practical ability [3]. Then, the positive changes in the structure, scale, and efficiency of the entire higher education will bring about a fundamental improvement in the relationship between education and economic and social development [4]. Because the Subject-Oriented Education mode implemented by ordinary colleges and universities for many years pays attention to learning. Students not only have different grades, but also have different attitudes towards learning and learning motivation [5]. If we use traditional teaching methods, we will not have enough food to learn well, and we will not have enough food to learn poorly, and polarization will become more and more serious. When teachers can fully understand the students' latest development zone, and then use the relationship between the students' existing development level and the level of the latest development zone to organize teaching, they can promote students' development rapidly and sustainably, and accelerate the speed of development [6].

Hierarchical teaching is a kind of individualized teaching mode based on students' differences. Teachers divide students into groups at different levels according to students' personality characteristics, intelligence differences and acceptance level [7]. Then, according to the grouping situation, different training objectives and teaching requirements are formulated, and a teaching mode is adopted to fully promote the development of students' intelligence with different teaching contents and teaching methods [8]. Teaching is carried out in accordance with the teaching class, and teaching ideas and methods, teaching contents and basic requirements are formulated and implemented in accordance with the level of the teaching class, so as to achieve the goal of making full use of educational resources and optimizing teaching effect. However, due to the large number of students, the students' learning ability and comprehension ability are uneven. Teaching in the traditional consent mode is not convenient for the students' practical ability [9]. However, due to the

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large number of students, the students' learning ability and comprehension ability are uneven. It is not convenient to train students' actual ability by teaching in the traditional consent mode. In the classroom teaching, teachers strive to provide students with the time and space for active participation, provide students with opportunities for self-expression, and also take the initiative of students to learn, so that students become masters of learning [10]. The phenomenon that freshmen are not suiTable for mathematics learning is getting more and more serious. The most prominent is that the new students often fail large-scale examinations.

2. The Present Situation of Mathematics Education in Higher Vocational Colleges

With the enlargement of the enrollment scale of ordinary colleges and universities, it is ineviTable to avoid the fact that the entrance scores of higher vocational students are uneven, especially in mathematics. Vocational education has changed from elite education before 1990s to popular education and universal education at present, which makes more junior and senior high school graduates have the opportunity to enter vocational colleges for Vocational education. As a result, students' basic knowledge levels are quite different, which brings great difficulties to the teaching of higher mathematics and new challenges to the curriculum reform. Therefore, the arrangement of basic courses such as mathematics is relatively small, and some colleges and universities even open only half a semester of mathematics courses. In such a short period of time, they cannot complete the teaching of basic knowledge of mathematics required for the study of professional courses. The results are also imaginable. In the past few years, the number of students in our college has also been diversified. The enrollment range has expanded from the province to the province. There are junior high school and high school graduates, as well as secondary vocational students. There are both "five-year" colleges and three-year and two-year colleges. At present, some domestic vocational colleges draw on the experience of foreign research and the experience of stratified teaching in secondary vocational schools in China, and begin to study and practice the stratified teaching of basic courses. The author found that students from science classes in mathematics are generally better than those from liberal arts classes and counterpart classes. For science students themselves, the polarization is also obvious, and the implementation of teaching is difficult.

In order to analyze the changes in the academic performance of the stratified teaching, the difficulty of the stratification test is basically equal to the difficulty of the final semester exam paper. The following is the comparison of the two results of the experimental class, as shown in Table 1.

Table 1 Comparison of Students' Achievements before and after Stratification

Before and after stratification	Actual number of candidates	More than 85 points	70 to 84	60 to 79	Below 60 points
Before stratification	30	2	3	6	19
After stratification	30	19	3	4	4

Because the time of higher vocational students in school is generally only three years, compared with undergraduates, the time of study in school is short and the hours are tense. At the same time, the basic principle of arranging the teaching content of theoretical courses in higher vocational education is "moderate and sufficient". Hierarchical teaching of mathematics in higher vocational colleges is a good combination of various teaching methods and methods. It realizes the teaching idea of taking people as the main body, achieves the good educational purpose, achieves the good training of talents, and meets the needs of society for talents in Higher Vocational colleges. Carefully study the syllabus and textbooks, according to the cognitive level of students at different levels, determine the different requirements of students at different levels. The author found that in some classes, some students are liberal arts classes, and some are science classes. Some come from key middle schools in developed areas, others from underdeveloped areas want to enter undergraduate courses after completing the higher vocational education. Therefore, in the evaluation of students' learning, the evaluation methods are diversified, and the content and requirements of different mathematics courses are combined with the classification of content

classification and requirements, and the evaluation methods based on basic requirements are evaluated. Therefore, the time and energy spent on mathematics is more, and some students want to participate in work after graduating from higher vocational colleges. They do not pay much attention to mathematics. The basic situation of students differs greatly from the learning objectives of this stage. Because of these differences, the teaching objectives of mathematics classes are difficult to achieve and the teaching effect is not good.

The data in Table 2 shows that the degree of differentiation between the experimental class and the control class is basically similar before the experiment, but after a period of experiment, the degree of differentiation of the experimental class is gradually reduced, which indicates that the experimental class can basically control The phenomenon of polarization, and the control class failed to effectively control the polarization.

Table 2 Mathematical test scores of experimental and control classes

Semester	Class	Coefficient of variation CV	Difference coefficient of variation
First admission	Experimental class	26.9%	-6.1%
	Control class	32.1%	
Mid-term semester	Experimental class	19.6%	-2.8%
	Control class	22.4%	
End of the first semester	Experimental class	18.6%	-5.9%
	Control class	24.5%	

In order to understand the impact of stratified teaching on students' psychology and students' non-intellectual factors, different forms of investigation are conducted in the process of teaching. They are respectively proposed: 1. Whether the purpose of learning is clear, 2. Whether there is interest in learning, 3. Whether there is a sense of success, 4. Whether there is self-study, 5. Is there an enterprising spirit, and 6. Do you feel that you have made progress? As shown in Figure 1.

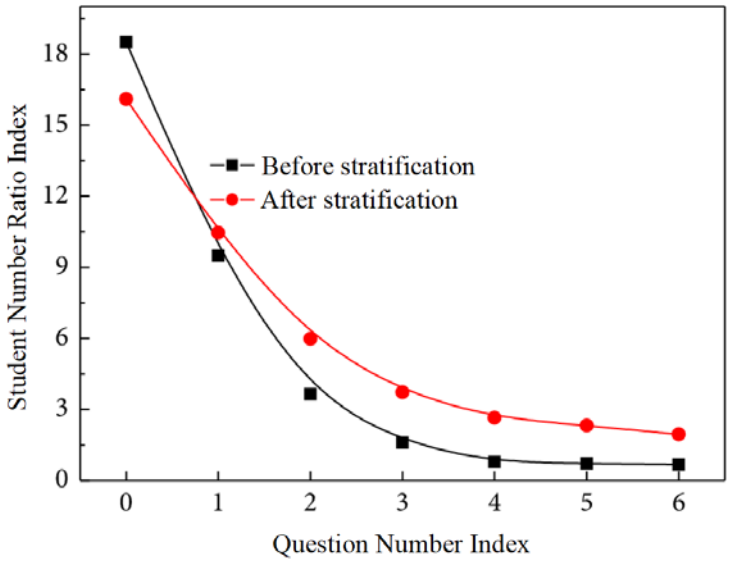

Fig.1. Contrast chart of the influence of stratified teaching on students' non-intelligence factors

3. Importance of Hierarchical Mathematics Teaching in Higher Vocational Colleges

The importance of implementing stratified teaching in higher vocational mathematics is closely related to the importance of higher vocational mathematics teaching. The implementation of higher vocational mathematics stratification teaching affects every higher vocational student. Therefore, it also affects the development of the whole society. The importance of stratified teaching in higher

vocational mathematics is composed of the following aspects. Advanced mathematics is one of the compulsory courses for most vocational students. Learning advanced mathematics is of great help in cultivating students' good thinking habits and thinking skills. In the process of learning, moderate anxiety contributes to the improvement of academic performance, but excessive anxiety will affect the healthy development of students' mind and body. Therefore, the construction of teaching mode should strive to enable students to study and live in a moderately anxious environment. Through the study of mathematical knowledge, students can master certain mathematical abilities, apply certain mathematical abilities to solve professional problems in various majors, and help students master various professional problems. Mathematics is a tool subject and the basis of all modern majors. All majors will be applied to certain mathematical knowledge more or less. Higher vocational students' mathematics level, learning ability and learning habits are uneven when they enter school, and their learning goals are often guided by their majors. Their demands for mathematics knowledge and quality are different.

Due to the different abilities of Higher Vocational students, the unified teaching mode has a certain hindrance effect on the cultivation of students' abilities. It can not fully stimulate the potential of each student, nor can it carry out targeted education for each student. However, the traditional mathematics teaching uses unified teaching materials, syllabus, basic teaching requirements and teaching plans. Teachers and students have little choice. It suppresses the students' personality, restricts the development of students' specialties, and seriously hinders the improvement of teaching quality. Layered teaching is the premise of layered teaching. The specific goal is that students with weak foundation can master the basic knowledge and skills of the course, and have the ability to analyze and solve problems. Students with good foundation can further broaden their horizons, develop their thinking, improve their abilities and creatively complete their learning tasks. After the stratified teaching, because the gap between the students at each level is small, the teacher is clear at what level of the class, the difficulty of teaching design is reduced, the pressure on the students preparing for the lesson preparation is reduced, and the purpose of teaching is more clear. The ability to master the classroom has also increased. In addition, layered teaching can optimize the relationship between teachers and students, form a good style of study and teaching style, and optimize the educational environment. To benefit students, benefit the school, improve the quality of students, and achieve teaching at all levels for all students, teaching students in accordance with their aptitude. At the same time, it has enhanced the pertinence of teaching work so that students can get what they need and learn. It fully embodies the school's student-oriented thinking and promotes the healthy development of all students.

4. Conclusion

The stratified teaching of higher vocational mathematics trains the practical talents of modern society. According to the requirements of the society for talents, it is necessary to cultivate students' theoretical ability and students' operational ability. The implementation of grouping and stratified teaching can improve the quality of teaching, enable students to learn and gain interest in learning mathematics, and eugenics can eat well, enhance self-learning ability and absorb knowledge independence. Hierarchical teaching can make more students experience the joy of success, reduce psychological stress, cultivate good mathematical emotions, and give full play to students' learning autonomy and inner potential, thus improving students' mathematical literacy. The hierarchical teaching experiment of Higher Vocational Mathematics conforms to the characteristics of higher vocational mathematics teaching and the cognitive characteristics and development rules of Higher Vocational students. It can greatly improve the quality of mathematics teaching and promote the implementation of quality education. The hierarchical teaching experiment of mathematics in higher vocational colleges has brought into full play the advantages of class teaching system, discarded the shortcomings, considered the students' personality differences to the maximum, and fully embodied the principle of teaching students in accordance with their aptitude. It causes a certain psychological burden to low-level students, which is easy to produce inferiority complex. It leads to students with weak willpower breaking pots and falling down, so that they can not teach students in accordance

with their aptitude. In this way, the students of all levels of majors can truly realize the enjoyment of learning, gain and use of learning in Higher Mathematics learning, truly embody the requirements of quality education, and meet the needs of society for high-quality and skilled talents.

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