Initiatives on Stratified Teaching in Public Foundation Courses from the Perspective of High-Quality Development of Vocational Education

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Abstract. Developing high-quality vocational education is particularly vital on the path to China's new century and new journey. It is essential to establish a teaching strategy that is tiered by students' needs and teachers' instructional techniques in order to fully reflect the significance of public foundation courses and the challenges they confront. This will help foster the development of high-quality vocational education.

1. Introduction

The 20th National Congress of the Communist Party of China made a profound discussion on "implementing the strategy of developing the country through science and education and strengthening the support of talents for modernization", such as "integrating general education with vocational education" and "optimizing the types of vocational education". It is emphasized that workers of higher vocational education must have a strong sense of responsibility, and make their own efforts to continuously cultivate high-quality technical and skilled talents for the sustainable development of the country, with the aim of providing solid human backup and full intellectual support for the realization of the two 100-year goals and the great rejuvenation of the Chinese nation. To this end, the specific goal of public foundation courses is to provide vocational students with the comprehensive knowledge and learning ability needed to support the study of professional courses, to prepare for the comprehensive literacy required for future employment positions, and to pave the way for students to continue their studies and research.

2. Background of stratified teaching

At the present stage, China's vocational education is highly valued by the state, and higher requirements are put forward for the quality of education and teaching along with a series of policies and measures that are introduced to encourage and support the development of vocational education. It brings several impacts on the existing vocational education teaching: First, the number of students getting enrolled in higher vocational colleges witnesses a rapid growth, meanwhile there are problems brought by the diversification of student sources. The foundamental knowledge of different types of people varies greatly, especially non-school students, who are too busy with their work to recall basic knowledge. Second, the quality of teaching is different in different regions, and the difficulty of teaching is also different. Finally, even the requirements of general high school students and vocational high school students in the same region are not the same. From various practical situations, it is crucial to make our education and teaching better adapt to the educational environment and students' objective differences, effectively implement comprehensive quality education, improve students' learning performance and learning ability, develop students' positive personality, and enhance teachers' classroom teaching efficiency, and hence the student-centered and material-based stratified teaching mode is the most appropriate to be implemented.

3. Theoretical framework of stratified teaching

The theory of stratified teaching has been widely recognized, both from ancient times to the present day and from the West to the East. There are four main theories: "Teaching students according to their abilities" is a long-established educational idea in China Confucius; Bloom's "mastery learning" theory; Garner's theory of "multiple intelligences"; Vygotsky's "zone of most recent development" theory. From the research results of scholars in different regions and different generations, it is clear that stratified teaching is suitable for difference individuals. Fully understanding and respecting students' individual differences, teaching activities are student-oriented, which is conducive to coordinating and perfecting the development of students' knowledge, skills, intelligence and abilities; promoting students' progress; promoting students' personality development and all-round development; and improving teaching efficiency.
4. Criteria for implementing student stratification

Stratified teaching in essence means that teachers scientifically divide students into groups or classes based on their existing knowledge, ability and potential developmental tendencies, with each group at a similar level, and teachers choose appropriate teaching methods to give each group individual instruction and individual evaluation to enhance a more efficient teaching quality. According to the literature, most of the research on the subject is divided into three levels, and some divide students into four levels. Although achievements have been made, they are accompanied by some problems that need to be solved urgently, including the problem of teacher allocation, the problem of equity in education for students, the problem of psychological disparity of students, and the problem of evaluation of teachers' teaching effectiveness. In response to the problems that have emerged and the actual teaching experience summed up, it is not appropriate to divide students into multiple levels. Instead, two levels would be more appropriate. Taking the students of mechatronics technology and higher vocational mathematics courses [6]as an example, the scientific stratification is combined with the guiding and voluntary principles. The levels are split into two levels, A and B, in order to fully exploit the benefits of stratified teaching and avoid the drawbacks of stratified education.

Students at level A are required to have a good foundation in mathematics[7], a deep theoretical understanding for further study, and to be mathematics enthusiasts. They are generally able to "disperse" the basic knowledge and principles learned to mathematical practice problems, mathematical extension problems and professional knowledge. Their specific characteristics are good mathematical foundation, strong divergent thinking ability[8], willing to participate in mathematical modeling competitions, interested in further study in post-secondary education, able to actively cooperate with teachers in teaching, and open to discussion on mathematical problems with their classmates, and being enthusiastic for learning mathematics. In addition to the A-tier students are the B-tier students, which constitute the main part of stratified teaching and avoid the drawbacks of stratified education.

5. Different teaching methods and teaching strategies are required at different levels

Traditional teaching and layered teaching mode are both products of social education development, each has its own advantages and disadvantages, and attention should be paid to complementing the shortcomings in teaching. Give full play to the advantages of both, try to avoid the disadvantages of both, mobilize the enthusiasm of teachers, improve teaching efficiency, give full play to the individual strengths of each student, so that they can do their best, develop comprehensively and become useful talents for social development.

According to the literature and actual teaching experience, the differences between traditional classroom teaching and tiered teaching are mainly different in meaning, teacher-student relationship and status, teaching subjects, teaching tasks, teaching methods, teaching steps and teaching evaluation, so the process of implementing tiered teaching can be designed as a step (the first step to understand the differences and classify the group; the second step to address the differences and classify the goals; the third step to refine the teaching content and achieve the goals; the fourth step to face the whole group and apply the goals; the fifth step to examine the stage and classify the assessment; the sixth step to develop the evaluation and continuously improve). The third step is to refine the teaching content to achieve the goal; the fourth step is to face all people and teach according to their abilities; the fifth step is to examine the stage and assess the classification; the sixth step is to evaluate the development and improve continuously). The methods and strategies used in the teaching process must be designed according to students' levels, grasp the starting point of knowledge of teaching content, connect the transition of knowledge, minimize the slope of teaching knowledge cannot be too large, and progress in a gradual manner. Follow the teaching principle of "students as the main body, teachers as the leader, and ability as the goal" in the hierarchical teaching to achieve the teaching purpose of all students "can learn, will learn" and fully ensure the implementation of the hierarchical teaching mode.

5.1. Teaching objectives stratification

In essence, teaching objectives are both the direction and destination of teaching activities, and also the main basis for evaluating and measuring teaching effectiveness, so it is crucial to set teaching objectives. The establishment of hierarchical and graded teaching objectives is a guarantee for the successful implementation of tiered teaching. The mutual support and motivation of all elements will better facilitate the implementation of teaching and learning. For different levels of students, teaching objectives should be specifically set according to students' basic and stratified filing needs. Beyond students' basic objectives, students will have difficulty learning, and below students' basic and learning abilities, students will feel that they cannot learn anything and will lose interest in the course. Appropriate teaching objectives will stimulate students' interest in learning, but also test the collective wisdom of the course team teachers and bring challenges to them.

5.2. Teaching content stratification

With appropriate teaching objectives, refined teaching contents are also very important. Different contents are chosen according to different needs. For example, students who need to continue learning should choose generalized and comparable determinants, etc., while students of B level who just focus on academics do not need to, but pay more attention to practical life cases, downstream problems, cost optimization problems, etc.
Combining the two levels of A and B, the selection and design of teaching contents should be done in five cognitive concepts: first, to have a full understanding of students' existing basic knowledge and learning ability; second, to have a full choice of individual guidance and individual motivation methods; third, to have an academic height of the knowledge content of teaching in the curriculum system; forth, to have a reasonable use of teaching tools and teaching methods; finally, to have a reasonable use of students' learning effort and the quality of teaching should be designed in advance. Concerning the content design of mathematics in general, it is best to plan two lessons at a time, explain a complete knowledge point, without leaving behind knowledge points to the next lesson.

5.3. Teaching pace stratification

The teaching progress should be reasonably designed according to the foundation of students at both levels to fully ensure the effectiveness and quality of students' learning. A reasonable teaching schedule ensures that students follow the requirements in an orderly manner and also allows them to experience the enrichment of gaining knowledge and the joy of learning, which is the ultimate purpose of stratified teaching. It is inaccurate to mention in some literature that the difficulty of teaching is reduced to accommodate the foundation of B-level students. Instead of lowering the difficulty level, the stratified teaching is to change the traditional teaching model to better accommodate students of different learning types, so that students can experience different learning modes and choose and adapt their own learning methods to improve the efficiency and quality of learning.

5.4. Stratified teaching staff

5.4.1. Stratify teachers according to their titles and teaching ability

Let teachers with high titles and good teaching effectiveness teach in A-level courses, and for young teachers who have just started their careers can serve both as teaching assistants of A-level teachers and in B-level teaching tasks. This tiered approach not only reduces the pressure of teaching teachers in different levels of classrooms (the change of different classrooms and different teaching styles can greatly reduce classroom efficiency), but also helps young teachers adapt to the new teaching environment faster and improve the new teachers' own teaching level, while experienced teachers can learn from the new teachers who bring new teaching concepts and teaching styles. Through the implementation of this tiered teaching system, a mentoring system of "passing on and helping" has been established, allowing young teachers to grow up quickly and to better study the teaching reform.

5.4.2. Stratification according to the college's specialization

Stratification according to the college's specialization. Teachers taking mathematics courses for a fixed major can discuss with other non-mathematics majors in the major in order to accumulate and expand the knowledge of the major and to connect with mathematical knowledge in the classroom teaching of this course to stimulate students' interest in learning and to better integrate the professional knowledge for the major.

5.5. Layering of homework assignments

The implementation of homework layering uses the ladder principle and a step-by-step approach, and it is an important part of the implementation of layered teaching. In the process of implementation of teaching, educators found that the difficulty of a reasonable layered assignments in order to consolidate the learning results achieved by students, to further effectively test students' learning, to stimulate students' learning potential, to fill students with self-confidence in learning, and at the same time the incentive mechanism under which students have gained learning results, will also play a good role in cultivating and leading students' sound personality. Assignments are actually learning tasks that teachers pre-determine for students, and their purpose is implicitly guided by the teachers' teaching content. The completion of students' assignments is not only a reflection of teaching effectiveness and learning effectiveness, but more importantly, it is a process for students to conduct independent learning and develop their self-learning ability and ability to solve new problems. When designing homework, teachers must be targeted, should take what they have learned in class, basic knowledge as the starting point, consider the difficulty of acquiring knowledge and students' characteristics, use the theory of students' nearest development zone, design a task that can stimulate students' interest and has certain realistic or developmental significance, the purpose is to build a learning "scaffolding" for students' development. The purpose is to build a scaffold for students' development, so as to help them build their knowledge system and achieve the purpose of self-improvement of their knowledge system. The effectiveness of knowledge construction can be evaluated in three ways: first, the process; second, the results; and third, the expansion and motivation. The process refers to the initiative and motivation students show in completing the task and the creativity in solving the problem; the result refers to the formation and progress of the task or assignment on students in terms of habits and attitudes; and the third is the continuous influence of the whole task or assignment on students' potential stimulation, psychological quality and personality development. [9].

5.6. Stratified assessment and evaluation

Students' tiered assessment and evaluation is the driving force of implementing tiered teaching. Tiered teaching
requires teachers to treat students with a developmental perspective and not to base their evaluation on students' existing foundation, both first impressions. Regardless of the level of students, teachers should follow the principles of objectivity and motivation when evaluating them, and give full play to the diagnostic and motivational functions of evaluation. In the evaluation of students in tiered teaching, modern information technology should be used to record students' learning process [10], including pre-study before class, performance during class, completion of tasks after class, mutual evaluation among classmates, teacher's comments, participation in activities and other comprehensive indicators, rather than being limited to achievement evaluation alone, which can reflect students' progress should indicate students' growth. The timely display of evaluation results facilitates motivation and enhances students' self-confidence, and also recognizes teachers' care, recognizing and encouraging students' progress from a multidimensional perspective. The evaluation should focus more on learning initiative, motivation and individual spiritual character enhancement. Quantitative criteria for A level and B level can be different, as A level focuses on theory, so the weighting is appropriately high in the final theory test, while B level students focus on successful graduation, so the weighting of examining students' student attitude and student behavior can be increased.

6. Conclusions

There are some disadvantages in the implementation of tiered teaching. If students are not explained well beforehand, and they do not understand the meaning of tiered teaching, they will not be fully psychologically prepared and will often be emotionally tense, anxious and resistant, which will be detrimental to students' learning and teachers' work. Classroom management in tiered teaching is also prone to loopholes, mistakes and errors, which can directly lead to changes in students' attitudes and enthusiasm for learning due to these misunderstandings. Given some of the problems that can occur with tiered instruction, to implement tiered instruction well teachers need to prepare and plan well in advance to try to avoid known teaching problems. Tiered teaching better meets the development needs of students, but in the process of implementation also needs the strong support of the college, the close cooperation of each major, while the standards of tiered should also change with the needs of the times for vocational education, always pay attention to the dynamics of vocational education, timely update the corresponding changes, to promote the high-quality development of vocational education play an important role in public foundation courses.

Reference

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