Research on the innovation of teaching mode of vocational and technical education

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Abstract. Vocational and technical education group is the main training object of new high-quality talents in our school, and teaching is the basic link of Vocational and technical education. The current teaching mode of Vocational and technical education has the disadvantages of emphasizing theory and neglecting practice. Therefore, it is necessary to discuss the teaching mode of Vocational and technical education in our school. Based on the current situation of the teaching mode of Vocational and technical education in our school, this paper puts forward the teaching and assessment mode of "combining theory with practice" and "combining thinking cultivation with practice".

1 Introduction

For a long time, the theory teaching focusing on concepts, theorems and formulas and the examination mode focusing on problem solving have become the leading teaching mode of Vocational and technical education in most colleges and universities, including our university. The advantage of this teaching mode is that it pays attention to the cultivation of students' solid theoretical foundation, which helps to master the basic knowledge, but the disadvantage is that it ignores the Enlightenment of thinking, which is not conducive to the cultivation of students' practical ability to apply knowledge to solve practical problems. The transformation of talent training mode puts forward new and higher requirements for the teaching mode of College English.

As a specific term in modern teaching theory, teaching mode is a relatively stable implementation plan of organizing, designing and regulating teaching activities under the guidance of certain teaching ideas or teaching theories in order to achieve certain teaching objectives. Since the mid-1980s, in order to solve the problem of disconnection between teaching theory and practice, the research on teaching mode has become a hot topic in the domestic teaching theory research.

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The essence of human society is innovation. Innovation ability is not only a prerequisite for a nation and a society to be full of vigor and vitality, but also a symbol of the development level of a nation and a society's civilization. It is an important part of a country's comprehensive national strength. Innovation not only brings rich material output for the whole country and society, but also brings new impetus for the change of human civilization. It can improve the quality of life, open up the living space and realize the value of life. In this sense, the cultivation and development of innovation ability not only makes education become the promoter of economic and social development and change, but also the promoter of individual development.

2 Guiding ideology and teaching objectives

Following the guiding ideology of our school construction, through the reform of Vocational and technical education teaching mode, we can improve the modernization, scientificity and rationalization of curriculum teaching, and lay a solid foundation for the cultivation of new talents with high quality.

2.1 Students Are the Main Body of Teaching Activities

2.1.1 Students Are the Masters of Teaching Activities

Students' learning enthusiasm is the basis of successful teaching. Only students actively learn, actively recognize, actively acquire teaching content, and actively absorb the spiritual wealth accumulated by human beings, can they choose and receive knowledge and information, and promote their own development. In a certain sense, active learning is the basis of innovative education. Teachers' learning relative to students is external cause, external cause can only work through internal cause, and teachers' teaching can only take effect through students' absorption and digestion. In the process of teaching, the interaction between teachers and students aims to achieve students' creativity and personalization. Therefore, students are the masters of teaching activities, especially innovative education. Innovative education can only be realized in the process of students' active learning.

2.1.2 Students are active explorers of knowledge

In the innovative education activities, students are not only the receivers of the knowledge taught by teachers, but also the more important thing is to digest the knowledge, analyze the internal relationship between the new and old knowledge, dare to get rid of the old and bring forth the new, and dare to discover themselves. In this sense, students are explorers and knowledge seekers in the teaching process. For students, teaching is far from a simple increase in knowledge, but with the existing experience, knowledge and culture, and leads to the change of attitude, individual and their future choice direction. Therefore, only by giving full play to students' subjectivity can we make teaching more creative and make students develop better.

2.1.3 Students are the reflectors of learning activities

Learning has reflective nature, which is the metacognition emphasized by modern cognitive psychology. In innovation education, although there are also perceptual thinking that can be understood directly or directly, critical thinking is more important. With this kind of

thinking, we can take into account the conditions available in learning, and can constantly verify the proposed hypothesis of problem solving, and obtain novel and unique problem-solving answers, so that learning activities can better achieve the functions of orientation, monitoring and adjustment. Therefore, reflective critical thinking is an important part of innovation ability.

2.1.4 Students have different personalities

Students have individual differences, which are related to heredity, environment, education and their own efforts. The individual differences of students are also the colorful embodiment of their subjectivity development. The development of students' individuality has both generality and individuality. While promoting the development of generality, school education should also promote the development of individuality. It is the traditional education that distorts the development of human beings and strangles the development of personality. Innovation education should respect and protect individual personality development, and provide loose space for students' personality development is also an important content of its implementation.

2.2 The innovation of classroom teaching should be mediated by problems

The transformation of knowledge to innovation is mediated by problems. In the view of innovation education, problem refers to the inherent contradiction of knowledge itself, that is, the limitation, relativity and deficiency of knowledge. Therefore, finding, raising, analyzing and solving problems are the process of knowledge development and innovation. The problems discussed in traditional teaching are superficial and repetitive, which lack the function of innovation.

2.2.1 The problem is the beginning of classroom teaching

This is because questions are the starting point and driving force of thinking. Only when students feel the need to ask "why", "what" and "how to do" can thinking really start. The primary task of innovative classroom teaching is to guide students to find all kinds of problems, and to learn knowledge with all kinds of problems.

2.2.2 Problem is the main line throughout the process of classroom teaching

The problem is the logical power of knowledge accumulation and development, and the seed of new ideas, new methods and new knowledge. Therefore, problems should not only be the beginning of classroom teaching, but also exist in the whole teaching process. Classroom teaching revolves around raising and solving problems. It goes up in a spiral way. Problems drive the display and learning of knowledge, so that students' understanding and mastery of knowledge reach a deeper level.

2.2.3 The problem is the end result of classroom teaching

The innovative classroom teaching should not only take the problem as the beginning and main line, but also take the problem as the end. The result of classroom teaching should not be to completely eliminate problems with knowledge, but to initiate more and more extensive new problems on the basis of initially solving existing problems. We regard the generation of new problems as one of the important results of innovative classroom

teaching. This is because the significance of these new problems is not only that it can make teaching activities go on endlessly, but also that it can eventually lead students to the road of innovation and become innovators.

2.3 Classroom teaching should be characterized by innovation and openness

The openness of innovative classroom teaching corresponds to the closeness of traditional classroom teaching. The closeness makes "classroom teaching become mechanical, boring and stylized, lack of vitality and fun, lack of challenge to wisdom and stimulation to curiosity, so that the vitality of teachers and students can not be brought into full play in the classroom." Closure will inevitably lead to fossilization. Only by opening up can it be enlivened. Openness is a prominent feature of innovative classroom teaching.

2.3.1 The opening of teaching materials

Textbook knowledge is the unity of absolute truth and relative truth. As absolute truth, it has the characteristics of certainty, uniqueness and stillness; as relative truth, it has the characteristics of variability, diversity and development. Traditional teaching overemphasizes the absolute side of teaching materials, and regards teaching materials without omission as the fundamental and only purpose of teaching. Innovative teaching should face up to the opposite side of teaching materials, open teaching materials, enrich teaching materials, surpass teaching materials, make teaching materials become the real "springboard" of teaching activities, and become the powerful support of students' innovative activities. According to our experimental experience, the open teaching materials mainly include: 1. Reduction and activation. Restoring teaching materials is to restore the language of teaching materials to the actual things it reflects. By restoring, we can change the abstract into the image, the profound into the superficial, and the dull into the vivid, so that knowledge can "walk" out of the books, become vivid things, and enter the students' spiritual world. 2. Supplement and adaptation. Due to the limitation of written form, teaching materials are always concise and general. There are "gaps" and "short circuits" in teaching materials. Although the words are exhausted, the meaning is still. It leaves students free space for imagination and reasoning. This is a favorable factor for innovative teaching. Teachers should encourage students to expand, speculate, imagine, fill and describe. The purpose of the adaptation or reorganization of teaching materials is to change the existing way of teaching materials, which includes: "changing the genre", "text reorganization", "changing the angle", "changing the role", "changing one topic", "multiple solutions to one topic", etc. Through adaptation or reorganization, we can change the way of thinking and cultivate the flexibility and flexibility of thinking. 3. Question and surpass. Questioning includes criticizing the inadequacies or defects of the textbook, and also putting forward different opinions on the viewpoint of the textbook, which is not only the requirement of cultivating innovative quality, but also the requirement of improving the textbook itself. Transcendence is the ultimate goal of using textbooks, which means that students have risen to a higher level with the help of textbooks.

2.3.2 Process openness

The closed process is presupposition, and the open process is generative. Teaching should be planned, but not planned, or over rigorous (such as program teaching and target teaching). Regarding the relationship between plan and teaching, kraftky, a German educator, has made a brilliant argument: "to measure whether a teaching plan has the quality standard of pedagogy is not to see whether the actual teaching is as consistent as

possible with the plan, but to see whether the plan can enable teachers to take flexible actions arguably in teaching theory, so as to make students carry out creative actions Learn by contributing to the development of their conscious abilities - even limited contributions. " Teaching plan and teaching plan should provide the pillar for creative teaching in class, instead of becoming the "tight hoop curse" of classroom teaching activities. Classroom teaching should not be a closed system, nor should it be restricted to the preset fixed and unchanging program. The pre-set teaching plan needs to be open to direct experience and flexible elements in the implementation process. Teaching objectives must potentially and openly accept the unexpected experience. We should encourage the improvisation of teachers and students' interaction and surpass the requirements of the target. The opening of the process may affect the teaching progress or the so-called teaching task of some classes, which is very prominent at the beginning of the experiment. However, we should have a developing vision. First, from traditional teaching to innovative teaching, this is a negative process, a process from order to disorder to order; secondly, the completion of teaching tasks in a certain class does not affect the overall development of students. The most important thing in classroom teaching is to cultivate students' independent learning ability and innovative quality. This is the process of students' independent learning Development is also the fundamental strength of teaching development.

In the actual teaching process, according to the different requirements of teaching objectives and teaching contents, while retaining the classroom teaching environment, we can create a diversified teaching environment of software and hardware, so that students can actively discover, explore and think, so as to cultivate students' creative and cognitive ability. To build a mature and relatively complete innovative classroom teaching system, we still need to study and experiment constantly.

3 Teaching mode reform plan

3.1 Reduce theoretical teaching hours and increase self-study links

Vocational and technical education group is the training object of high-level talents in our school. After the screening of entrance examination, they generally have a certain technical foundation and higher ability. The teaching task of Vocational and technical education stage should be located in the cultivation of thinking and the expansion of thinking. This provides the possibility for the compression of theoretical teaching hours. The compressed class hours can be used in the practice of teaching, so as to focus on cultivating students' ability to apply ideas to solve practical problems, so as to achieve the teaching purpose of "learning for use" and "learning for application".

3.2 Pay attention to the inspiration and guidance of ideas

For a long time, in the theoretical teaching, teachers pay attention to the explanation of specific theorems, formulas and problem-solving ideas. The existing problem is that they are divorced from specific practical cases, resulting in the abstract, boring and non targeted theoretical teaching. In the process of specific theory learning, students do not even know the role of formula, theorem and other knowledge points in solving practical engineering problems, which practical problems can be applied to which specific knowledge points, which makes the learning process full of blindness.

While paying attention to theoretical teaching, vocational and technical education should not ignore the guidance of ideological inspiration and ideas. Specifically speaking, when teachers explain specific knowledge points in the teaching process, they should focus

on the idea of solving problems. At the same time, through the analysis of targeted engineering cases, they should explain the application fields of specific theories and the problems that can be solved, so as to lay a foundation for Vocational and technical education to participate in specific scientific research work.

3.3 Add Practice Link

At present, some practical courses have been set up in China, but they have not received enough attention. The purpose of practical teaching is to improve students' learning enthusiasm, improve their awareness of application, and cultivate their ability to understand and solve practical problems with their knowledge and computer technology. Different from the traditional way of learning, it emphasizes the students' hands-on and brain based learning. In practice, due to the introduction of computer and the application of software package, more and more extensive contents have been injected into the ideas and methods of mathematics, so that students can get rid of the tedious calculation and numerical calculation, and promote the combination with other disciplines, so that students have time to do more creative work. In fact, practice is to make full use of the advantages of fast computing speed of computer, combine knowledge with computer to promote traditional teaching, so as to use computer to help students solve practical problems with the knowledge they have learned. Therefore, the idea of practice should be integrated into the teaching, and the practice course should become an important technical basic course.

Schools should provide a good practice environment for Vocational and technical education students according to the actual situation. Teachers should combine the teaching content and vocational and technical education for scientific research, select some representative engineering and technical problems and abstract them into problems, teach students to use MATLAB and other common software for simple programming, data analysis and data processing, and improve students' ability to use ideas for abstract modeling and solve problems based on computer technology.

3.4 Improve the examination system

The traditional examination is mainly a closed book examination, which focuses on students' mastery of concepts, theorems and formulas and their ability to solve problems. For the vocational and technical education group, this way of examination is not conducive to the cultivation of students' thinking ability and hands-on ability. We should take a combination of closed book examination and practical examination. The weight of the two examination methods is 50% respectively. Students' mastery of basic knowledge points can be assessed through closed book examination, and their ability of innovative thinking and solving practical problems by using computer technology can be assessed through practice. On the one hand, it is conducive to enlightening thinking and encouraging "learning for application", on the other hand, it is conducive to all-round assessment of students' ability level.

4 Evaluation of teaching mode

The evaluation of teaching mode is a complex process of multi parameters. There are many evaluation parameters. The importance of each parameter reflecting the achievement of teaching purpose cannot be known exactly. Therefore, it is difficult to determine the weight coefficient of each parameter reasonably. This paper uses fuzzy clustering method to classify the parameters of state assessment from the teaching status data, and analyzes the

influence of each attribute on the classification of state data samples to reflect the importance of teaching mode evaluation.

(1) Determine the matrix of teaching mode

The n decision parameters closely related to the change of teaching mode are $A = \{a_1, a_2, \cdots, a_n\}$ selected as the data samples of the m group $X = (X_1, X_2, \cdots, X_i, \cdots, X_m)$, and the decision matrix $X = \{x_{ij}\}_{m \times n}$ of the state information of teaching mode is obtained,

which x_{ij} represents the attribute value X_i of the a_j parameters in the sample.

(2) Data normalization

Because the dimension of different parameters may be different, and the measured attribute value may not be in an order of magnitude, so the data should be normalized before fuzzy equivalence classification.

For the parameter with larger attribute value, the better, the normalization formula is

$$r_{ij} = \frac{(x_{ij} - x_j^{\min})}{(x_j^{\max} - x_j^{\min})} \cdot \alpha + (1 - \alpha) \tag{1}$$

where $i=1,2,\ldots,m$; $j=1,2,\ldots,n$. For the parameter whose attribute value is smaller, the better, the normalization formula is

$$r_{ij} = \frac{(x_j^{\max} - x_{ij})}{(x_j^{\max} - x_j^{\min})} \cdot \alpha + (1 - \alpha) \tag{2}$$

where $i=1,2,\ldots,m$; $j=1,2,\ldots,n$. α is the maximum $x_j^{\max}$ value of parameter j in all samples; $x_j^{\min}$ is the minimum value $x_j^{\min}$ of the j-th parameter in all samples; α is the equilibrium factor is usually taken as 0.9.

5 Conclusions

In view of the shortcomings of Vocational and technical education teaching mode, this paper aims at improving the modernization, scientificalness and rationalization of curriculum teaching through the reform of Vocational and technical education teaching mode, and laying a solid foundation for training high-quality new military talents, and probes into the new ideas of the reform of Vocational and technical education teaching mode, and puts forward the "combination of theory and practice" The teaching and evaluation mode of "combination of thinking training and practice" emphasizes the importance of practice in teaching, and provides suggestions for the transformation of school teaching mode.

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