

Analysis on the Application of Case Teaching to “Mechanical Manufacturing Fundamentals” in Higher Vocational Colleges

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Abstract: Higher Vocational College is the Important Base for the Cultivation of Professional Talents in Various Industries in China. the Course of “Mechanical Manufacturing Fundamentals” Occupies a Vital Position in the Daily Teaching in Higher Vocational College. But According to the Current Situation, Affected by Many Factors, “Mechanical Manufacturing Fundamentals” Has Not Been Effectively Carried out, Producing a Serious Adverse Impact on the Improvement of Professional Ability and Comprehensive Quality of Students. Therefore, This Paper Mainly Focuses on the Teaching of “Mechanical Manufacturing Fundamentals” in Higher Vocational Colleges, Puts Forward the Existing Problems, and Then Analyzes the Strategies of Applying Case Teaching to “Mechanical Manufacturing Fundamentals”, Hoping to Promote the Teaching Efficiency as Well as the Professionalism and Professional Technology Level of Students.

1. Introduction

The Course of “Mechanical Manufacturing Fundamentals” in Higher Vocational Colleges is Mainly to Improve students’ Understanding and Mastery of the Fundamentals of Mechanical Manufacturing, Such as the Knowledge of “Parts Forming”, “Processing”, “Construction Technology” and Other Relevant Aspects, and Promote students’ Analysis Ability and Innovation Ability. It Can Be Seen That the Traditional Teaching Methods Can No Longer Meet the Needs of This Course in the Current Higher Vocational Colleges. It is of Great Necessity to Actively Reform the Teaching Mode According to the Actual Teaching Situation and students’ Situation, Such as the Application of Case Teaching.

2. Important Role of Case Teaching Method in Higher Vocational Education

2.1 Enhance the Realistic Sense of Theory

According to the current situation, to a certain extent, the knowledge understanding ability and absorption ability of students in higher vocational colleges are relatively weaker than those in undergraduate colleges and universities, especially the ability to understand abstract knowledge. Therefore, it is essential to use relatively special teaching methods to help students understand and absorb knowledge. In this case, the application of case teaching method can attract students to actively participate in the discussion, so as to help students deepen their understanding of abstract knowledge points.

2.2 Stimulate Students’ Interest in Learning

Students in higher vocational colleges are generally not interested in theoretical knowledge. If teachers adopt the traditional way of teaching, it may leads to students’ descending learning enthusiasm. In the application of case teaching method, students are the main body in the teaching process, which is more conducive to stimulating their enthusiasm for learning.

2.3 Improve Students’ Ability to Analyze and Solve Problems

By applying typical cases to classroom teaching, students are able to analyze problems and propose solutions independently. In this process, students can understand and master the theoretical

knowledge more effectively, and gradually apply the theoretical knowledge to the reality, thus effectively improving their ability to analyze and solve problems.

2.4 Promote the Comprehensive Quality of Students

Talents trained in higher vocational colleges should not only have strong professional skills, but also good language expression ability and communication ability. In the process of case teaching, teachers usually choose the way of group discussion to carry out teaching, which not only promotes students' professional ability, but also improves students' language expression ability, so as to achieve the improvement of their comprehensive quality.

2.5 Promote the Comprehensive Quality of Teachers

In teaching, the application of case teaching method investigates teachers' teaching ability, knowledge reserve, teaching attitude and other aspects, which requires teachers to make full preparations before carrying out teaching activities. It is conducive to promoting teachers' comprehensive ability and quality.

3. Current Situation and Problems of the Teaching of “Mechanical Manufacturing Fundamentals” in Higher Vocational Colleges

“Mechanical Manufacturing Fundamentals” belongs to a professional and technical basic course, with a wide range of knowledge, including mechanical equipment processing, thermal processing, engineering materials, metal processing and other basic knowledge. Affected by the arrangement of other professional courses, “Mechanical Manufacturing Fundamentals” has been greatly reduced. At this time, if the traditional teaching is still applied, in order to catch up with the teaching progress, most teachers will choose to adopt the cramming teaching method, seriously ignoring the main position of students in the teaching process. Meanwhile, teachers will not pay attention to the practicality and comprehensiveness in professional teaching, but directly instill knowledge points in students. In this way, it is not only difficult to show the relevance between the teaching content and the reality of mechanical manufacturing, but also not conducive to students' acceptance and understanding of teaching content, which may make students believe the learning content is too abstract and boring, and gradually lose interest and enthusiasm in learning.

But in fact, “Mechanical Manufacturing Fundamentals” is an important foundation of mechanical manufacturing courses, which plays an import role for other more in-depth professional courses. Because the traditional teaching method has a significant single feature, its application leads to seriously boring classroom teaching, and fails to guide students to improve and enrich their creativity on the basis of learning knowledge. In addition, for most students, the main purpose of learning is to cope with the final exam, so “rote learning” is usually adopted to memorize knowledge points, leading to the increasingly serious disconnection between theoretical knowledge and practice. As a result, students seriously lack a comprehensive vision to understand and grasp the major of Mechanical Manufacturing, and the ability to use knowledge points. Therefore, in order to promote students' ability, it is a must to carry out effective teaching reform in accordance with the course of “Mechanical Manufacturing Fundamentals” in higher vocational colleges.

4. Analysis on the Application of Case Teaching to “Mechanical Manufacturing Fundamentals”

4.1 Implementation Steps of Case Teaching in “Mechanical Manufacturing Fundamentals” in Higher Vocational Colleges

The important basis of the course of “Mechanical Manufacturing Fundamentals” in higher vocational colleges is the selection and preparation of cases applied by teachers. Before carrying out formal teaching activities, it is necessary for teachers to make detailed preparations for relevant teaching contents, and make scientific choices for appropriate cases and knowledge points worthy of discussion, so as to ensure the adequacy of case preparation before class.

Moreover, before class, teachers are required to first distribute cases to students so that students can make full use of their spare time to get familiar with the cases. Teachers can also guide students to supplement appropriate materials according to the given cases to improve students' interest and enthusiasm in learning this course, help students actively collect and think about relevant information and put forward corresponding solutions.

In the formal teaching activities, teachers organize students to discuss the cases and exchange ideas by group discussion. After that, the representative of each group elaborates on the unified point of view within the group. Teachers will affirm and summarize the highlights of each group's speech, and then organize a collective discussion. Teachers are required to pay attention to the main position of students in the teaching process, timely conduct corresponding enlightening guidance to students, and supplement and deepen students' missing or inadequate knowledge points at the right time, so as to promote the full play of students' subjective initiative.

At the end of each case teaching, teachers should fully objectively summarize the content and process of this teaching, to ensure that students can further deepen the knowledge they have mastered, carry out the analysis of problems, put forward solutions and solve the actual problems.

Finally, teachers will ask students to make a summary according to the process of case teaching, and organize it into written materials. The contents should include: (1) basic data of the case; (2) problems existing in the case; (3) ideas and solutions to the problems. It is suggested to carry out the activities of comparing and summarizing the written materials among students, thus promoting students to deepen the thinking of the case and actively adjust the thinking and effectively improving students' ability to analyze and summarize problems.

4.2 Supplementary Research on Case Teaching in “Mechanical Manufacturing Fundamentals” in Higher Vocational Colleges

In the process of application of case teaching method, the most important link is the selection of case materials by teachers. For the course of “Mechanical Manufacturing Fundamentals” in higher vocational colleges, cases can be real production cases or typical students' assignments.

Teachers should first fully understand the teaching content, collect, screen and analyze the cases in the actual production process, and select the most suitable issues for students to discuss, so as to promote students' enthusiasm for learning. In addition, teachers need to guide students to actively carry out independent learning, collect, sort out and analyze relevant cases independently, and select cases suitable for classroom teaching.

What should be noted is the difference between students. According to students' learning abilities and personalities, cases can be divided into three levels, namely “complete independently”, “complete with assistance” and “unable to complete independently”. For the students who have the ability of independent completion, teachers should implement an open guidance strategy in which only the relevant cases are conveyed, but the rest is to be considered and supplemented by students themselves. For the students who are capable of completing case analysis with assistance, teachers need to give them targeted guidance, so that students' thinking and analysis can be inspired. For those who cannot complete independently the case analysis, teachers are advised to firstly make an explanation to help students understand and accept the knowledge points, and gradually cultivate the ability to explore and analyze cases in the process of digesting knowledge.

After the completion of case teaching, teachers file and save the cases which are well handled in the teaching process, so as to facilitate the reference and research work in the future teaching process.

5. Conclusion

The so-called “case teaching method” refers to quoting classic and real cases on the basis of teaching objectives. Teachers guide students to actively participate in the exploration and discussion, and conduct more in-depth analysis of controversial issues, so as to make students' team cooperation ability, innovative thinking ability and comprehensive ability be significantly improved. Applying case teaching method to the course of “Mechanical Manufacturing Fundamentals” in

higher vocational colleges can not only promote students' enthusiasm and initiative in learning, but also improve students' professional ability, which will lay a solid foundation for the in-depth and effective learning of the follow-up related courses, and finally realize the delivery of high-quality professional talents for China's modern mechanical manufacturing industry.

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