

The Practical Path of Accelerating the Teaching Reform of Engineering Machinery Major in Higher Vocational Colleges

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Abstract: With the continuous development of economy, the professional and technical teaching in higher vocational colleges needs to keep up with the development of the times, vigorously cultivate innovative high-quality talents, and focus on the cultivation of students' practical ability in daily teaching. This paper will deeply explore the new mode of the education reform of the mechanical manufacturing specialty in higher vocational colleges. First, it analyzes the problems existing in the teaching of mechanical engineering in higher vocational colleges. Then, it probes into the teaching methods of engineering machinery, and discusses the specific strategies of the teaching reform of mechanical engineering in higher vocational colleges for reference.

Keywords: Higher vocational education; Mechanical engineering; Reform in education

Introduction

Mechanical major is one of the most important majors in higher vocational colleges, which has high requirements for students' practical ability, imagination ability and innovation ability. Therefore, teachers should combine the current actual situation, reform and innovate the teaching work, introduce more new education and teaching methods, provide more opportunities for students to practice and create, increase teacher-student interaction, establish a good teacher-student relationship, timely solve problems encountered by students in the learning process, and improve students' interest in learning. In the process of participating in classroom learning, students have stronger hands-on ability and teaching quality will be improved accordingly.

1. Problems in Mechanical Engineering Teaching in Higher Vocational Colleges

Mechanical engineering teaching in higher vocational colleges is difficult and the teaching process is uncontrollable. Therefore, there are still many problems in teaching, including:

1.1 Unclear teaching objectives

The teaching work is uncontrollable, so it is more necessary to clarify the teaching objectives. However, at present, many higher vocational colleges are not clear about the teaching goal of mechanical engineering, so there is no characteristic curriculum system, and the training of mechanical applied talents is insufficient, which makes it difficult for students to truly master professional and technical abilities, which is not conducive to the future career planning and development of students.

1.2 Unreasonable class hour arrangement

Compared with other majors, mechanical engineering majors pay more attention to practice. To enable students to truly master the knowledge and skills of mechanical engineering, they must participate in the practice and constantly improve themselves through practice. However, at present, many higher vocational colleges have less settings for mechanical engineering practice links and less class hours for practical courses. In this case, students' professional ability and practical ability cannot be improved, and the teaching effect will be greatly affected.

1.3 The practice teaching environment needs to be improved

The practical teaching link is different from the theoretical teaching link. The practical teaching work has higher requirements for the teaching environment and teaching hardware facilities. However, the current mechanical foundation course is not equipped with modern multimedia equipment, which leads to the limitation of course teaching. In the process of explaining theoretical knowledge, the use of information equipment to show students the mechanical model is helpful to strengthen students' understanding. However, many teachers in vocational colleges are too old, and many old teachers have certain operational barriers to the use of multimedia equipment, so they cannot skillfully use modern teaching equipment.

1.4 The main learning position of students is weakened

Influenced by the traditional teaching mode, many teachers are still affected by the traditional teaching ideas in the process of practical teaching. The teaching mode is single. Teachers have always been in the dominant position in classroom teaching, and students' learning needs have not been timely fed back, which leads to teachers' unclear understanding of students' learning and affects the teaching quality. This kind of wrong teaching mode directly leads to the reduction of students' learning effect. In the future work, students will have problems

such as weak foundation of professional knowledge.

1.5 Inadequate practical ability of teachers

Practical teaching has a high demand on teachers' professional practical ability, but higher vocational teachers are generally better at theoretical research and less involved in professional practical activities. The lack of teachers' practical ability also affects the practical teaching of mechanical engineering to a certain extent. In particular, the practical ability of some young teachers is difficult to support the development of practical teaching, resulting in poor practical teaching results.

2. Research on innovation practice teaching reform of mechanical engineering in higher vocational education

2.1 Modularize the training courses and carry out the training courses in stages

Due to the strong practicality of mechanical engineering, the number of training courses in senior grades is large, and the types of work are also large, so the training courses are more diversified. Many higher vocational colleges adopt the principle of "multi skill parallel" and "average distribution", aiming to enable students to master diversified practical skills and improve employment flexibility. However, such training mode also leads to students learning more, learning less, being unskilled, not being able to quickly enter the job position, and receiving further training from the company, thus weakening the competitiveness of job hunting.

Therefore, higher vocational colleges can adjust this training mode to some extent. Freshmen in the first grade have not yet had a thorough understanding of their professional knowledge and are not clear about their career planning. Therefore, the practical training courses in the first and second grades focus on universal operation practice, so that students can master the basic professional training skills and form a preliminary understanding of the mechanical specialty and the work content of mechanical posts. In the third grade, students' career development direction is relatively clear. At this time, students focus on several practical training courses according to their own interests and wishes, guided by the skills requirements of employment posts. As a result, the practical training courses have played a full role and the students' skill level is relatively high.

2.2 Explore interesting teaching methods to improve the quality of classroom teaching

Teaching should be more interesting. First of all, teachers need to provide flexible teaching methods to make the training content interesting. In order to ensure the effective realization of teaching objectives, teachers should explore open and diversified teaching methods, break the traditional teaching model, and make unified arrangements for teaching tasks and training projects, so that students can freely choose according to their own preferences, so as to achieve teaching objectives. Such training activities make students more relaxed, fully involved in the training, and complete the learning task with high efficiency and quality.

For example, teachers can design a group learning task - "Control of electric fans". In groups, students can give full play to their autonomy, fully think about communication and discussion, and jointly complete the task. The training results of the group shall be submitted to the teacher for review and evaluation. The teacher shall evaluate the results of the group practice activities. The teacher shall give students advice, guidance and support during the period, but shall not interfere with the students' thinking. The students shall give full play to their creativity. In order to stimulate students' practical ability, teachers can design various forms of examinations to test students' learning effects, and at the same time give them some pressure to improve their learning efficiency. Teachers can also timely publish teaching materials and provide questionnaires on the WeChat platform to sort out students' questions for response.

At the same time, the current teaching work has been inseparable from the support of information technology. To ensure the quality of teaching, teachers can build a digital curriculum resource library, share curriculum resources on the platform, and form a networked teaching management system.

For example, virtual reality technology is introduced into professional training courses, and 3D digital technology is used to model, so as to create simulation type mechanical automatic operation machine tools for students, so that students can master the required professional knowledge in a dynamic and interesting learning atmosphere. For example, the digital training system is introduced, which automatically verifies the operation results of students. For the disassembly and assembly of machine tool motors, virtual voltage, power, load, torque and other influencing factors can be set for inspection, and the inspection results can be obtained. Students can analyze the results displayed by the system and write training reports.

2.3 School enterprise cooperation to jointly implement teaching work

At present, there are many problems in higher vocational education, such as shortage of training facilities, limited training time, and "more people and less machines". The construction funds for training facilities are relatively high. In most cases, the training equipment in colleges and universities cannot meet the requirement of operating a machine per capita, while some training equipment is idle, resulting in "insufficient commencement". The distribution of practical teaching resources is unreasonable; once a specific training project is put into construction, it is difficult to change and replace it later. However, the training equipment for mechanical specialty is generally large

equipment, with high unit price, high prices of processing materials, tools, etc., rapid wear and tear, and high equipment upgrading costs. Ordinary schools simply cannot afford it.

Therefore, through cooperation with enterprises, enterprises can be introduced, and existing mechanical equipment can be fully used to combine teaching with enterprise production practice. Higher vocational colleges can establish a processing workshop with enterprises, introduce some production activities of enterprises here, effectively reduce the cost of training equipment input of schools, and enterprises are responsible for some material renewal costs and raw material input. At the same time, the school actively participated in the enterprise production practice and work practice in the school, making the learning content of the practice more rich and interesting.

There are many ways to cooperate between schools and enterprises. For example, schools can accept orders from some companies for processing. The enterprise provides spare parts, and the school organizes students to process them in the school's training base; or the enterprise provides wool embryo products, and the school undertakes the processing project, and the teachers and students cooperate to complete the project. For the whole order processing project, the company will provide processing parts and bear the loss of machines. The school will mainly provide human resources, and the economic benefits generated will be jointly controlled by both parties. This invisible benefit is greater. In the process of processing external orders, both students and teachers have been trained.

2.4 Take the vocational skills competition as an important starting point to enhance students' creativity

As an important practical activity for college students, the skill contest is of great significance for strengthening students' professional skills and promoting their comprehensive development. Colleges and universities should vigorously carry out vocational skills competition activities for higher vocational students, improve students' professional practice ability, strengthen students' creative thinking, and lay a good foundation for their future career. The skills competition has created a more tense practice environment, which makes it easier for students to stimulate innovative creativity in the competition, and then make some innovations in the process of practice. Innovation consciousness and innovation ability are very critical to the development of students in all aspects. Innovation is the vitality and vitality of students' learning. Once creativity is lost, students will lose their vitality and vitality. Teachers should encourage students to actively participate in various national technical competitions, broaden their horizons, and improve the level of teachers and students. In this process, they can also cultivate students' innovation awareness and innovation ability, and lay a foundation for students' future learning career.

In the National Skills Competition, students can learn many things that they cannot learn in school. Their creativity will be strengthened and their professional vision will be broadened. According to the requirements of the competition, appropriate processing and innovation should be carried out to exercise their professional skills on the basis of learning, which is also very helpful for students' employment. Students can better adapt to work after being trained in the competition.

2.5 Optimize operation design and pay attention to feedback

At present, the teaching materials of mechanical specialty have gradually strengthened the cultivation of innovative quality in homework arrangement, paid attention to the development of students' personality, and actively cultivated students' interest in learning. However, compared with the high attention paid to the classroom teaching reform of the mechanical specialty, the attention paid to the operation of the mechanical specialty is not enough, and the concept updating and actual operation are relatively lagging behind.

Therefore, it is necessary for teachers to optimize the design of theoretical course assignments for mechanical majors. The homework should first highlight the professional theoretical knowledge, so that students can consolidate and accumulate knowledge in the process of doing homework. The consolidation of basic knowledge should focus on understanding. On the basis of understanding, remember and accumulate. Then, in job design, they can be presented in the form of questions. In the process of using knowledge to solve problems, we should firmly remember. Secondly, homework should become a powerful driving force for students to broaden the learning space of mechanical professional knowledge. In order to achieve this goal, I think homework should be able to promote the formation of new knowledge and the development of ability, and cultivate new thinking processes.

Finally, the theory course assignment of mechanical specialty should promote students' more comprehensive development. Therefore, we should appropriately add creative elements to homework. The first dimension of multi operation is the accumulation of knowledge, which can be represented by the definition, composition and characteristics of mechanized mechanisms. The second dimension is the application of knowledge, which can be represented by drawing the motion curve of mechanical moving parts according to the description. The third dimension is the expansion of knowledge and the cultivation of creative thinking, which can be achieved by designing cam mechanisms that meet the requirements. Under the three dimensions of homework, students can not only avoid the traditional rote learning model, but also consolidate knowledge and develop creative thinking in this process.

2.6 Strengthen teachers' professional skills and build a high-quality team of teachers

At present, our country's higher vocational teachers are weak. Many teachers go directly to the school to teach after graduation. They have not been trained by professional posts, and their practical ability is not up to standard, which directly affects the teaching quality of

mechanical specialty. At the same time, teachers' practical skills are generally low because of the heavy teaching and scientific research work, few opportunities to practice and learn in enterprises, and short time. To solve this problem, higher vocational education can guide students to improve their professional practical skills by taking practical courses as guidance and subject research. The teacher first carried out research on the subject, deeply learned the practical operation skills in mechanical engineering, and applied them to practice, and then served as the teaching of practical courses.

Some students' learning ability is weak, and a considerable number of students do not have clear learning goals, so they have low enthusiasm for participating in the training courses. Therefore, teachers can establish a connection point between theory, skills and post work, strengthen the correlation between the three, and improve students' learning enthusiasm. In the learning process, students often encounter the phenomenon that theory is divorced from practice, which makes them unable to combine theoretical knowledge with operational methods in practical implementation, thus leading to a decline in learning enthusiasm. One of the main reasons for this problem is the separation of theoretical teaching and practical teaching in teaching design. To solve this problem, higher vocational education can combine theory and practice courses by establishing skill modules, and carry out teaching activities according to units. Each small skill module can be integrated to form a project. Combined with the training equipment of the school, the training form and content can be refined. Each skill module contains theoretical knowledge, practical operation, independent practice, etc. Modular teaching can combine theory with practice, and enable students to combine theory with practice. It can not only improve teaching effect, but also increase students' interest.

3. Conclusion

Introducing a new teaching model and adhering to the combination of theory and practice is an important means to improve teaching quality and strengthen students' quality. Higher vocational education should comply with the requirements of the times and social development, constantly adjust the education concept and teaching methods. At the same time, schools should also strengthen training facilities, equip appropriate teaching equipment, and fully mobilize students' interest in learning in teaching, so as to improve students' learning efficiency. In a word, higher vocational education needs to take the cultivation of application-oriented talents as the starting point, build a team of double qualified teachers, optimize the curriculum content, build a reasonable curriculum system, create a high-quality training base, organize post practice, improve the evaluation system and other ways and strategies, promote the reform of mechanical engineering practice teaching, cultivate more professional, scientific and complex mechanical talents, so that students can truly have employment in society Comprehensive ability to survive and develop.

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