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Curriculum Reform of Employment-Oriented "Design of Machinery" Based on OBE Education Concept

Mengying Lin

Wenzhou Polytechnic, Wenzhou, 325100, China

Abstract: *With the continuous development of the social economy, the market's demand for talents is also constantly changing. "Design of Machinery" is an important curriculum for mechanical majors. Students majoring in machinery use not only a theory but also practical technology after employment. Therefore, in the teaching process, teachers should make reasonable plans, introduce more employment-oriented practical content, and promote the employment of students. It is necessary to integrate the teaching concept of OBE (outcome-based education) into the teaching process, to improve the effectiveness of the "Design of Machinery" curriculum, and to promote the reform of teaching methods.*

Keywords: *employment-oriented curriculum; "Design of Machinery" course; OBE (outcome-based education)*

To adapt to the demand of the post, the comprehensive ability of students needs to be cultivated during the teaching process of the "Design of Machinery" curriculum. Teachers should innovate their teaching mode and improve the quality of teaching. Only in this way can they improve students' core literacy and meet the job requirements for future employment. Outcome-Based Education (OBE) is an outcome-oriented teaching model, aimed at the reform of basic education, which first appeared in the United States and Australia[1].

The changes in the international economic situation have put the domestic manufacturing industry under enormous pressure. Based on this situation, the employment situation of college students majoring in machinery is increasingly grim. The mechanical major is typically applied, and the content of teaching must be employment-oriented. "Design of Machinery" is the basic curriculum and compulsory curriculum for mechanical students, which has an important impact on the employment of students. Therefore, in the teaching process, teachers must pay attention to the comprehensive ability training of students. Integrating OBE teaching concept into the teaching of the "Design of Machinery" curriculum, and carrying out comprehensive teaching reform can improve students' application ability and practical ability, which is conducive to the improvement of students' core literacy and has significance for the improvement of students' competitiveness [2].

This paper mainly analyzes the current situation of the teaching of the "Design of Machinery" curriculum for mechanical majors and the effective strategies for the OBE teaching reform of the employment-oriented course.

1. Teaching status of Mechanical Design of "Design of Machinery"

1.1 The teaching content is backward

Although the teaching mode and the teaching idea in the continuous teaching reform process have made great progress. But the updating of the textbook has hysteresis. Therefore, the current teaching content of mechanical majors in colleges is still based on traditional old textbooks[3].

But with the continuous development of society, all kinds of technologies and crafts have changed dramatically. The content covered by the old textbooks has become lags with the actual technology, which is an important factor affecting the usefulness of mechanical design courses.

Therefore, to promote the teaching reform of mechanical design courses, the teaching content needs to be optimized and innovated, and the teaching content that meets the market employment

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requirements needs to be selected, hence, to improve the professional skills of students.

1.2 The teaching equipment is backward

The “ Design of Machinery “ course contains a lot of theoretical knowledge, but at the same time the mechanical major is also very practical, so the arrangement of practical activities is very important in the teaching process. Many teaching equipments need to be used in practical teaching, including circuit control panels, numerical control equipment, mechanical equipment, etc. However, the teaching equipment of many schools is relative backward, and some schools have insufficient teaching equipment [4]. Technology requires guidance and operation. There is no way to improve students' professional skills only by relying on theoretical knowledge. Therefore, in the process of teaching in colleges and universities, we must pay attention to the update of teaching equipment.

1.3 Lack of innovation in teaching mode

The purpose of teaching reform is to increase the employment rate of students. Therefore, teachers need to emphasize practicality in the teaching process. Employers' demand for talents is constantly changing under the changing trend of the market economy. To carry out teaching reform, teachers need to fully understand the actual demands of enterprises and employers, and on this basis, reform their teaching mode. The traditional teaching model emphasizes the explanation of textbooks but lacks practicality[5]. Therefore, when promoting teaching reform, teachers should aim to promote employment and take the requirement of employers as the direction of teaching.

2. OBE teaching reform measures for the employment-oriented “Design of Machinery” curriculum

2.1 Career planning education

To carry out employment-oriented teaching, career planning teaching should be carried out first. College graduates, whether choosing employment or starting a business, are at an important stage at the beginning of their careers, so career planning education is very important for college students. Career planning education needs to be added to the teaching of mechanical design courses. Above all, teachers should help students analyze the characteristics of mechanical majors, so that the future development direction of students can be clarified, and then the future work direction and enterprise units can be clarified. The premise of career planning education is to let students set their own goals so that students can know what they want to do and what direction they want to develop. Based on this, we can promote the reform of teaching and improve students' learning initiative and creativity [6].

2.2 Job-seeking conduct education

Students will not only use professional knowledge and professional skills in the work but also include important work skills such as communication skills and comprehensive literacy. From the perspective of employment, the quality of college students includes two aspects, one is the professional knowledge of the students, and the other is the professional conduct of the students. Therefore, the employment of college students is closely related to their conduct. The employment-oriented teaching of Mechanical Design requires teachers to guide students' professional attitudes and ethics in the teaching process. Whether an individual's work can be achieved is affected by the individual's comprehensive literacy, which can be represented by the individual's statements and actions. Therefore, being civilized and well-behaved is a plus point in the interview process, which can improve the employment rate and competitiveness of students [6].

2.3 Work psychology education

Compared with interpersonal communication in society, interpersonal communication on campus is relatively simple. College students generally lack the experience of social practice and setbacks, which makes them lack psychological preparation for employment and weak psychological endurance [7].

The job search and employment of college students is a two-way choice process, in which there is a chance of success and a lot of chance of failure at the same time. Especially in self-employment, the risk of failure will be higher. Therefore, in the teaching reform of the “Mechanical Design” course for

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employment, the psychological state of students' employment needs to be paid attention to, and the psychological quality of students needs to be strengthened, which is of great help to graduates career selection and employment.

In the process of developing employment psychology education, students' feelings need to be given priority. Teachers need to empathize and carry out teaching activities from the perspective of students. For example, by taking college students to visit local enterprises, the post-employment environment and treatment can be known in advance, avoiding excessive psychological expectations for employment.

A typical psychological phenomenon of students when they take up occupation is that they will tend to reject employment opportunities in other provinces, even if the salary is higher than that of local jobs. The reason for that is because they are afraid of unknown places and people[7].

Teachers can help students have a deeper understanding of the industry by teaching them industry knowledge. Based on an in-depth understanding of the industry and accurate psychological expectations before employment, students can be fully prepared for employment, so that the employment rate of students can be improved [3].

2.4 Adopt interactive teaching method

The reform teaching based on an employment-oriented “Design of Machinery” curriculum demands students' practical ability to be focused and be cultivated, which is different from the traditional teaching of mechanical Design curriculum which focuses on theoretical knowledge. Students' practical ability can be cultivated by increasing the proportion of practical activities in the classroom. The interactive teaching mode can be used in practical activities. Through the interaction between teachers and students, the actual situation of students can be better understood, which is convenient for teachers to carry out targeted teaching implementation in the follow-up. At the same time, the interaction in the classroom can also make the classroom atmosphere more active, the students' learning enthusiasm and efficiency are improved, and the students' knowledge can be consolidated through practical exercises. Furthermore, students' language skills and communication skills are very important in employment. Using the interactive teaching mode, students' language expression ability and communicative ability can be trained and improved, which plays an important role in the employment and development of students after graduation [8].

2.5 Conduct software-assisted teaching

For mechanical students, the ability to operate professional design software is one of the important professional abilities. Teachers can use the software to assist in teaching, help students understand complex mechanical structures, or analyze the mechanical properties of materials. In the teaching of mechanical principle courses, SolidWorks, AutoCAD, MATLAB, and other software are integrated into teaching activities, and the principles of typical mechanical structures are analyzed and designed to calculate, which can maximize students' ability to operate the software. To promote teaching reform, the limitations of traditional teaching, that is, relying on teachers' explanations, must be broken. On the other hand, auxiliary teaching software needs to be widely used. Students can truly understand and master the relevant knowledge of mechanical design and improve the effectiveness of teaching by participating in the operation of the software [9].

2.6 Conduct experiment assisted teaching

In the teaching process, teachers should use practical experiments to assist teaching, because theory needs the practice to test. Experiment teaching can adopt the mode of project cooperation, and students conduct experiments based on groups. Therefore, students' practical operation ability, cooperation ability, and management ability can be improved, which plays an important role in the improvement of learning efficiency.

A mechanical major is a typical engineering application major, which is fundamentally different from other disciplines. For mechanical students, mastering theoretical knowledge is only the foundation. To carry out employment-oriented teaching, students' practical ability needs to be strengthened. Experimental teaching can improve students' hands-on ability and problem-solving ability. The problems encountered in teaching are all predictable, but in the process of actual work, the problems faced are changeable and unpredictable. Therefore, students majoring in machinery need to have the

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ability to analyze, deal with and solve problems. In the process of carrying out the experimental activities, students need to analyze and discuss the problem based on the group, and finally, come up with a solution. Such a teaching mode can cultivate students' ability to solve problems independently, and can also strengthen students' application ability [10].

2.7 Introducing innovative teaching thinking

The design method and design process of mechanical products are an important part of the teaching of "Mechanical Design". However, the product design cases in the textbook are relatively traditional and outdated, which are not suitable for the current social and enterprise development. Therefore, in the process of teaching, teachers should innovate teaching thinking and introduce the design concepts and design methods of new mechanical products into the teaching process, which can cultivate students' creativity and stimulate students' imagination. In the process of product design, product conception, design analysis, and performance check are all important contents in the teaching of mechanical design courses. Introducing the design method of new products into teaching can make students have a better understanding of the current mechanical design methods and processes and have a certain perspective on the development of future machinery, hence, improving students' comprehensive ability and strengthening students' product design ability [10].

3. Conclusions

In conclusion, the OBE teaching concept is of great significance for the reform of the teaching of the "Mechanical Design" curriculum.

Integrating the OBE teaching concept into the teaching process can reform the teaching according to the demands of the market, therefore, establishing effective teaching goals, cultivating students' comprehensive ability, and improving the quality of teaching. In this way, graduates can better adapt to employment positions and improve the employment rate graduates. The OBE teaching concept is result-oriented, and the teaching based on this is more focused on the cultivation of students' practical ability rather than the improvement of theoretical ability. This requires teachers of mechanical majors to be employment-oriented and fully understand the market. When teaching, teachers should guide students on industry-related knowledge in addition to professional knowledge and promote the reform and development of mechanical design course teaching.

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