

Innovation and Reform of Mechanical Manufacturing Process Equipment Design Teaching

Enbing Qi, Mingqi Liu*

Taishan University, Taian, China

Abstract

The innovation and reform of mechanical process equipment design teaching aims to improve the quality and effectiveness of teaching, and cultivate talents that better meet the needs of the industry. By reforming teaching content and methods, introducing modern design concepts and technologies, strengthening practical teaching, stimulating students' interest and enthusiasm in learning, and improving their innovation and engineering practice abilities.

Keywords

Mechanical process equipment design; Teaching innovation; Teaching reform.

1. Introduction

With the rapid development of science and technology, the traditional teaching method of mechanical manufacturing process equipment design can no longer meet the needs of modern industry. In order to cultivate mechanical manufacturing process equipment design talents with innovative abilities and practical experience, it is particularly important to innovate and reform existing teaching methods. This article will discuss the innovation and reform of mechanical manufacturing process equipment design teaching.

2. Problems Existing in The Current Teaching of Mechanical Manufacturing Process Equipment Design

- ① Outdated teaching content: Existing teaching content often focuses on traditional design theory and manufacturing technology, while ignoring the needs of emerging technology and modern industry, resulting in the inability of the knowledge students learn to adapt to actual work.
- ② Single teaching method: The traditional classroom teaching method is mainly based on teachers' lectures, and students passively accept it. There is a lack of opportunities for active thinking and practical operation, and it is difficult to cultivate students' innovative and practical abilities.
- ③ Insufficient practice links: Practical teaching often only focuses on simple experiments and internships, lacking solutions to practical engineering problems and failing to cultivate students' practical work abilities.
- ④ The quality of teachers needs to be improved: Some teachers lack engineering practical experience and are unable to effectively guide students in practical activities, which affects the quality of teaching.

3. Teaching Innovation and Reform Measures for Mechanical Manufacturing Process Equipment Design

- ① Update the teaching content: Combine the needs of modern industry, update the teaching content, increase the proportion of emerging technologies and modern manufacturing

technology, and make the teaching content closer to actual production. At the same time, the combination of design and manufacturing is strengthened to allow students to understand the entire manufacturing process, from design to finished product.

② Diversified teaching methods: Use a variety of teaching methods, such as case teaching, project teaching, discussion teaching, etc., to guide students to think proactively and cultivate their innovation and problem-solving abilities. At the same time, network resources are used to build online courses and interactive platforms to facilitate students' independent learning and communication.

③ Strengthen the practical link: Establish a complete practical teaching system, including course experiments, course design, graduation projects and other links. At the same time, we will strengthen cooperation with enterprises and carry out school-enterprise cooperation projects to allow students to exercise their practical abilities in actual projects.

④ Improve the quality of teachers: Strengthen the training and introduction of teachers, and improve teachers' practical engineering experience and teaching abilities. At the same time, teachers are encouraged to participate in scientific research projects and engineering projects to improve teachers' scientific research level and practical ability.

⑤ Introduce innovative education concepts: Introduce innovative education concepts into mechanical technology equipment design teaching, focusing on cultivating students' innovative thinking and innovative abilities. Stimulate students' innovative potential by guiding them to think independently and explore proactively.

⑥ Strengthen students' dominant position: Put students as the center, give full play to students' dominant role, and make students the protagonists of the classroom. Through organizing discussions, group cooperation, etc., we can stimulate students' interest in learning and initiative, and cultivate their teamwork spirit and communication skills.

⑦ Pay attention to the cross-integration of disciplines: Strengthen the cross-integration of mechanical process equipment design and other disciplines, such as computer science, materials science, management science, etc. Through interdisciplinary learning and practice, students' knowledge and horizons are expanded, and their comprehensive qualities and abilities are cultivated.

⑧ Implement project-based teaching: By implementing specific engineering projects or scientific research projects, students can learn relevant knowledge of mechanical process equipment design in practice. Through project planning, implementation, evaluation and other aspects, students' practical ability, innovation ability and problem-solving ability are cultivated.

⑨ Establish diversified assessment methods: Change the single examination paper assessment method and establish diversified assessment methods, including work evaluation, project reports, teamwork ability evaluation, etc. Through comprehensive assessment methods, students' learning outcomes and innovative abilities are objectively evaluated.

⑩ Strengthen international exchanges and cooperation: Introduce foreign advanced mechanical technology equipment design concepts and educational resources through international academic exchanges, cooperative education, etc. By integrating with international standards, the level and influence of my country's mechanical technology equipment design education will be improved.

4. Conclusion

With the rapid development of science and technology and the continuous progress of industry, the teaching of mechanical process equipment design needs to be innovated and reformed to adapt to the needs of the times. By updating teaching content, diversifying teaching methods, strengthening practical links, improving teacher quality and other measures, we can effectively

improve the quality of mechanical technology equipment design teaching and cultivate more mechanical technology equipment design talents with innovative abilities and practical experience for modern industry. contribute to development.

References

- [1] Yang Peidong. Innovative Teaching Reform and Practical Exploration of SolidWorks-based Fundamentals of Mechanical Design Course[J]. Mechanical Management and Development, Issue 2, 2023, 69-70.
- [2] Zhu Xiaohui ; Ren Yanju. Reform, Innovation and Practice of Mechanical Manufacturing Equipment Design Course under the Goal of Cultivating Applied Talents[J]. Modern Agricultural Machinery, Issue 5, 2023, 91-9.
- [3] Zhang Shuai, Wang Yuxi, Liu Fangwei. Research and Practice on Teaching Reform of Mechanical Innovation Design[J]. Chinese Science and Technology Journal Database (Abstract Edition) Education, Issue 10, 2022, 0001-0003.