

Reform and Practice of Online and Offline Blended Teaching Mode for the Cultivation of Talents in Sino foreign Cooperative Machinery Manufacturing and Automation Majors

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Abstract

This article explores the issues and reform plans of blended online and offline teaching in the field of mechanical manufacturing and automation in Sino foreign cooperative education. In response to issues such as poor student self-discipline, limited offline teaching time, the need for improvement in traditional teaching, and inadequate evaluation mechanisms, various teaching methods, optimized arrangements, strengthened Q&A, and emphasis on process assessment are proposed. After one year of practice, the grades of the Mechanical Manufacturing Technology course have significantly improved, and the reform of online and offline teaching has achieved positive results, which has reference significance for improving the quality of Sino foreign cooperative talent cultivation in this major.

Keywords

Sino foreign cooperation; Evaluation mechanism; Online and offline; Mixed type.

1. Introduction

With the increasing number of Sino foreign cooperative education projects and enrollment in China, accelerating the internationalization of education and enhancing international competitiveness is of great significance. Sino foreign cooperative education can not only share teaching resources and experience, improve teaching quality, complement the disciplinary advantages of Chinese and foreign universities, form characteristic educational projects, but also introduce advanced foreign concepts and experiences, enhance students' literacy and employment competitiveness[1]. This article focuses on the major of "Mechanical Manufacturing and Automation", combined with the talent training program of Sino German cooperative education, analyzes the problems of blended online and offline teaching mode, studies reform plans and means, in order to improve students' abilities, cultivate professional talents, and make positive contributions to the development of China's mechanical manufacturing and automation field.

2. Existing Problems

The Sino German Cooperation in Mechanical Manufacturing and Automation (hereinafter referred to as the Mechanism Sino German) mainly targets the production front line of the mechanical industry, petroleum and petrochemical industry, cultivating talents engaged in vocational positions such as mechanical processing, equipment operation, installation, operation, commissioning and maintenance, process technology management, German technical data translation, and German related work. The courses in this major have the characteristics of a large number of subjects, strong comprehensiveness, and strong practicality. In order to achieve the goals set by the talent cultivation plan, a blended teaching mode of online

and offline has been carried out in the teaching process. There are the following problems in the teaching process.

2.1. Poor self-discipline of students in online teaching

Online teaching emphasizes students' self-learning and self-management abilities, requiring them to possess strong self-discipline. However, some students may lack initiative and self-discipline^[2], and may not be able to fully utilize online resources for learning. At the same time, the online teaching of professional courses in China and Germany adopts the form of German teachers+Chinese teaching assistants, which greatly reduces the effectiveness of online teaching when students are not proficient in German and have poor initiative and self-discipline.

2.2. Offline teaching time is limited

The professional courses of the Sino German program involve many abstract concepts, and German teachers need to cover a large amount of teaching content within a limited time. Therefore, it may not be possible to explain certain important knowledge points or concepts in detail, which limits students' understanding and mastery of these contents. Meanwhile, the limited offline teaching time has resulted in restricted interaction and discussion time between teachers and students, which to some extent limits the development of students' problem-solving abilities, critical thinking, and innovative thinking.

2.3. The teaching process urgently needs improvement

In the teaching process for German professional students in the mechanism, traditional teaching methods are still the main approach. The traditional teaching process usually centers around the teacher, emphasizing the imparting of knowledge and the listening of students, emphasizing the role of the teacher and the acceptance of the students. However, modern education tends to focus more on students' active participation and exploration, cultivating their creativity, critical thinking, and problem-solving abilities through heuristic teaching, group cooperative learning, project-based learning, and other methods.

3. Reform and Practice of Offline Blended Teaching Mode

3.1. Reform of Online Teaching Process

Firstly, choose appropriate technical tools such as video conferencing, online whiteboards, shared screens^[3], etc., to ensure good communication and interaction between teachers and students, and improve the quality of talent cultivation. Secondly, innovative online teaching methods are adopted, combining various forms of interactive tools and multimedia resources to enhance students' interest. Once again, release the content and test questions one week before the lecture, and design the teaching content based on the preview situation, handling different contents separately. Finally, teachers provide timely feedback and support after class, helping students understand knowledge through online discussions, individual tutoring, and encouraging questioning and mutual learning.

3.2. Optimization of offline teaching methods

Firstly, optimize teaching arrangements, plan courses and classroom management reasonably, and use methods such as interaction, role transformation, and group learning to improve efficiency and reduce time waste. Secondly, a reasonable Q&A session should be set up, with German teachers scheduling Q&A time slots, sorting and categorizing questions according to their importance and urgency, and giving priority to answering key questions. Once again, introduce learning communities and group activities to promote self-directed and collaborative learning through group discussions and projects. Help and assist each other within the group to improve German proficiency and learning outcomes.

3.3. Improvement of Teaching Process

The improvement of the teaching process requires a comprehensive consideration of multiple aspects, such as teaching methods, student participation, process assessment, and personalized teaching. One is to adopt diversified teaching methods such as lectures and group discussions to stimulate interest and promote deep thinking. The second is to encourage student participation through interactive teaching methods such as German Q&A, group collaboration, setting up group activities, role-playing, etc., allowing students to actively participate. The third is to strengthen process assessment, including classroom performance, homework, etc., to help students solve problems^[5]. The fourth is to focus on personalized teaching, understand students' characteristics and needs through one-on-one communication and diagnostic testing, and develop personalized plans.

3.4. Effectiveness of Reform

Through a one-year blended learning model reform of online and offline teaching in the mechanism of Sino German majors, students' participation and enthusiasm, learning outcomes, and ability levels have been greatly improved. Taking the mechanical manufacturing technology course of the Sino German program as an example, there has been a significant improvement in grades from the second semester of the 2021-2022 academic year to the second semester of the 2023-2024 academic year, as shown in Figure 1. The reform of the blended learning mode between online and offline has achieved significant results.

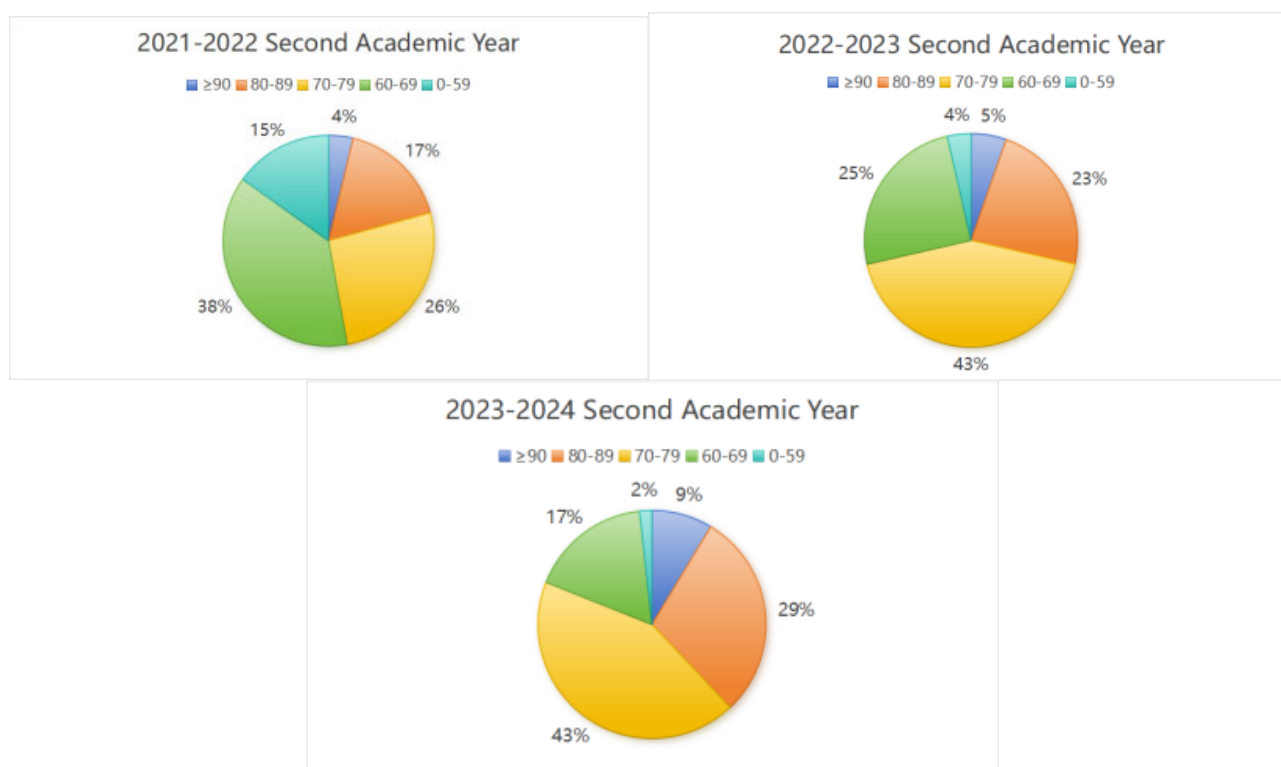


Figure 1. Distribution of grades for three consecutive academic years

4. Conclusion

This article analyzes the problems of the blended online and offline teaching mode in the process of Sino foreign cooperative education in the field of mechanical manufacturing and automation: poor self-discipline of students in online teaching, limited offline teaching time, and urgent need for improvement in the teaching process. Corresponding solutions are provided accordingly. Through the reform of the online teaching process, optimization of offline

teaching methods, and improvement of the teaching process, the mechanism of blended online and offline teaching mode for Sino German majors has been reformed. Through reform and practice, the overall learning enthusiasm and performance of students have been greatly improved, indicating that this teaching model can effectively promote student learning and has important significance for improving student performance and talent cultivation quality.

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