



Teaching Innovation of General Courses in Suzhi Education

A Case study of "charming Robot"

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Abstract. The Suzhi education of general courses assumes the responsibility of establishing morality and cultivating people and improving the comprehensive quality of students, and the development of robot-related technology is the focus of scientific research in recent years. Therefore, this paper explores the innovation of Suzhi education and teaching of robot general courses of frontier disciplines which are highly crossed by multiple disciplines and majors. First, the main problems facing the current general courses are put forward. Then, taking the general courses "Charming Robot" as an example, the basic reform implementation content and measures of Suzhi education teaching innovation are put forward. Finally, the innovative design exploration of Suzhi education with "professional" general courses is obtained, which can play a certain demonstration role and popularize application value for general courses of "engineering".

Keywords: Suzhi education; robot; general courses; college students

1 Introduction

In response to the first-class curriculum construction initiated by the Ministry of Education, the University Suzhi education Research Branch of the Chinese Association for Suzhi Education holds general course teaching innovation activities, aiming to promote the "student-centered" teaching innovation, and create a high-level, innovative and challenging general "golden course". To further develop Suzhi education and give full play to the responsibility of improving students' comprehensive Suzhi undertaken by the general curriculum of Suzhi education.

At present, general elective courses have been offered in most colleges and universities in China. The offering of this kind of courses can improve Suzhi education, expand the scope of knowledge, and then improve the comprehensive Suzhi, and make up for the deficiency of professional course teaching. The innovative ability of college students has been deeply improved, and personalized and diversified talents can be cultivated. Many scholars have made in-depth studies on general elective courses and Suzhi education. Li Haijun et al. ^[1] carried out in-depth teaching and research on general courses of artificial intelligence, and put forward the methods of cultivating innovative

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thinking. Lu Feiyi ^[2] took the experiential teaching of mental health education for college students as an example to explore the reform of teaching methods of general elective courses in colleges and universities. Zhang Hui et al. ^[3] put forward the teaching reform practice of the course "Intelligent Robot Technology" in view of the unclear teaching orientation and the lack of standardized curriculum standards and teaching models. Li Mengjia et al. ^[4] proposed to comprehensively promote the teaching reform of Suzhi education with students as the main body. Hu Ying et al. ^[5] explored the innovative teaching practice of general education courses. Zhang Yuchao ^[6] explored the teaching reform of general elective courses from the perspective of curriculum ideology and politics. Zeng Wenlu et al. ^[7] summarized the ways and effects of the teaching reform of general elective courses.

In short, many scholars have done relevant research on Suzhi education and general courses, but how to integrate the two organically and combine the current development of robots is a problem that needs to be solved.

Taking the general course "charming robot" as an example, this paper studies the teaching innovation methods of Suzhi education general courses, and explores the innovative teaching reform methods of Suzhi education for multi-disciplinary and multi-disciplinary interdisciplinary robot general elective courses. The innovative design is carried out from the aspects of curriculum system construction, teaching mode reform and innovation, teaching content optimization and renewal, teaching method reform and innovation, teaching resource construction, examination scheme construction and so on. The teaching innovation method, teaching mode and teaching method of Suzhi education in general elective course are obtained by taking "charming robot" as an example.

2 Major problems faced by general studies courses

In the process of teaching and learning general elective courses, there are several outstanding problems at present:

(1) Teachers and students have unclear positioning of general elective courses.

Many teachers have unclear positioning of general elective courses. Some of them take general elective courses as professional courses, and fail to analyze the learning situation they face and apply the knowledge of specialized courses into general elective courses. Some teachers only set up a course for the sake of the hours and workload, and there is a situation of coping with the whole general elective course. Therefore, some teachers fail to locate general elective courses correctly, resulting in low quality courses.

In addition, some students are quite different in discipline, which is quite different from the knowledge structure of general elective courses, which makes students not interested and feel that the knowledge they have learned will not be helpful to professional learning, so there will be a situation of learning professional courses in class. Some students may even miss classes, substitute classes, and so on. Students choose this course for the sake of class hour credits, and the phenomenon of mixed credits is relatively serious. "The theory of uselessness" is the real idea of many students at

present; the main reason is that the positioning of general elective courses is not clear, only teachers and students work together to correctly locate general elective courses in order to make great progress.

(2) The teaching content, teaching methods and assessment methods of general elective courses lack effectiveness.

Since most general elective courses are for students from non-majors, and the situation of students is relatively complex, usually interdisciplinary, cross-major, cross-grade or even cross-category, the fixed teaching content cannot meet the development of the situation at that time, and the situation will change from semester to year. As shown in Figure 1, the major comparison of the two classes in the fall semester of 2022-2023 shows that the structure of students has changed greatly. In addition, some teachers' course content is too professional, which will cause students to be afraid of difficulties, and eventually lead to the situation of not understanding, not interested, and mixed credits. There are also some teachers whose course content is too simple or repeated with other courses, which is inconsistent with the original intention of general elective courses and cannot complete the "mission" of general elective courses.

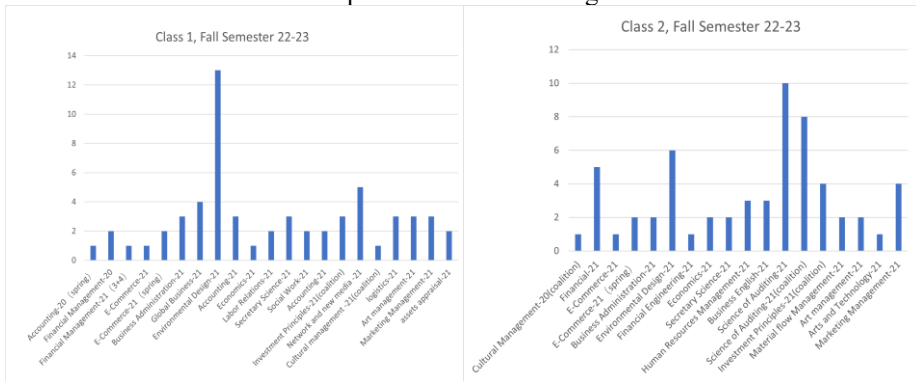


Fig. 1. Comparison of two classes in the fall semester of 22-23

In terms of teaching methods, it is generally explained by teachers on the podium, and the way students listen below cannot be student-centered, and students cannot give full play to their subjective initiative, which can easily lead to teachers' dry mouth and drowsiness. Students are unable to achieve the main objectives of the course. There is also a way for students to collect materials for reporting, but without comments, students cannot be effectively improved, only for the sake of reporting; in addition, the integration of curriculum ideology and politics is not enough or there is no curriculum ideology and politics at all; these problems in teaching methods cause the Suzhi education of general education to fall short of the standards that should be met.

In terms of assessment methods, some students are asked to write subject papers, and some are in the form of closed papers, both of which have many problems, among which many students directly paste and copy through online search, which cannot achieve the main purpose of assessment, and the scores of students can not be accurately determined. In the form of closed-paper examination, although the score can be

judged accurately, it cannot examine the students' innovative literacy, and there is a certain understanding deviation in the orientation of the curriculum.

The problems in these three aspects lead to the quality problems of general elective courses, which can not achieve "student-centered" teaching innovation. what's more, it can not effectively develop Suzhi education and give full play to the responsibility of the times to improve students' comprehensive quality.

With the rapid development of robot technology, robot courses have entered the ranks of general elective courses in colleges and universities in recent years. Our school set up a general elective course of "charming robot" in the spring semester of the academic year 2020-2021. The purpose of the course is to cultivate students' innovative spirit and ability, expand their horizons, take the practical application of robots in various fields as the main line, and take innovative design as the auxiliary. Teach the definition of robot, the type of robot, the development of robot and its application field. It mainly faces non-engineering and non-robot majors such as economy management, accounting, labor customs, etc., and students have no relevant knowledge background. So how to set up the teaching content, teaching mode and teaching method is very important.

3 Teaching reform implementation content and measures

The school has achieved certain results in the reform of application-oriented undergraduate education and teaching, and the general elective course "Charming Robot" is a frontier subject with a high degree of crossover among multiple disciplines and majors. The traditional teaching methods, teaching contents, assessment and evaluation methods can no longer meet the needs of talent training under the new situation. According to the specific situation of the school, the following reforms have been made:

(1) Construction of curriculum system.

The course "Charming Robot" is an undergraduate general elective course. It aims to cultivate students' innovative spirit and ability, expand students' horizon, lead students into the charming robot world, and deeply feel the infinite charm of robots. This course is designed to adopt a blended teaching method, combining online and offline. Through teaching, communication, display and other teaching methods, students can understand the specific definition of robot, master the classification of robot, and stimulate the innovation potential. Understand the innovation of scientific and technological innovation: Scientific and technological innovation comes from life. In this way, students can develop their academic innovation ability and apply it to their learning and research career.

This general elective course no longer explains professional knowledge alone, but combines the types and applications of robots to explain and discuss different topics such as military robots, agricultural robots, industrial robots, service robots and entertainment robots, and jointly discusses, reports and supplements with students to build a curriculum system based on "different topics".

(2) Reform and innovation of teaching mode.

Different from the traditional mode of teachers' speaking and students' listening, this

course arranges "different topics" for students to check materials under class, report in class, and then stimulate students' enthusiasm in the form of interactive discussion. Finally, teachers can check and make up for the deficiencies. In addition, the teaching and research department arranges several teachers to attend classes jointly for this course, jointly designs and prepares lessons for different topics, and constructs a teaching model based on "topics".

The course is based on the joint teaching, lesson preparation and design of many teachers. When there are some topics, the teaching work can be carried out in the class in a "debate" style in a small group, and the corresponding group management of students can be carried out, so as to give full play to the strengths of students, so that each student can have the opportunity to be a "leader", actively give play to the advantages of quality teaching, and let the general elective course play its role.

(3) Optimization and updating of teaching content.

For the student group facing general elective courses, it mainly cultivates students' innovative spirit and ability, expands students' horizon, and leads students to enter the charming world of robots and deeply feel the infinite charm of robots. Therefore, it is not necessary to focus on explaining professional knowledge, but only to introduce cutting-edge developments and some innovations from life to students. However, the field of robotics has been developing at a high speed, and it is necessary to supplement relevant teaching content at any time, combined with current events to stimulate students' interest and understand the latest robot development trends. Therefore, combining current events and robot related dynamic real-time teaching content optimization and update.

(4) Reform and innovation of teaching methods.

Robot related courses are specialized courses for mechanical and automation majors. When offered as general elective courses, the students who take this course are from all majors in the school, including management, art, economics, literature and other majors. These majors are all non-engineering majors, and there is a big gap in the way of thinking and learning of engineering, and there are many majors. In view of such situations, different teaching methods are established through real-time communication between students' reports and discussions, so as to teach students in accordance with their aptitude.

(5) Reform and innovation of assessment methods.

This course adopts whole-process assessment. In the whole course, according to the information collection, report, debate and other situations, the three teachers give comprehensive grades, and finally take the average of all "topic" scores. It mainly examines students' comprehensive abilities such as innovation ability and cooperation ability, thus expanding students' horizons and enlightening them for subsequent professional courses.

4 Application

The course "Charming Robot" is a frontier subject with multiple disciplines and specialties. The traditional teaching methods, teaching contents, assessment and evaluation

methods can no longer meet the needs of talent training under the new situation. Therefore, it is urgent to explore the teaching content, teaching mode and teaching method of this course, and it is representative of engineering courses. Through exploring the innovative design of Suzhi education of this professional course, it can play a certain demonstration role and popularize the application value of "engineering" general courses.

5 Conclusion

This paper takes "Charming Robot" as an example to study the innovative teaching methods of general courses in Suzhi education and explore the innovative teaching reform methods of multi-disciplinary and multi-specialty interdisciplinary robot general elective courses. From the aspects of curriculum system construction, teaching mode reform and innovation, teaching content optimization and renewal, teaching method reform and innovation, we get the innovative teaching method, teaching mode and teaching method of general elective courses Suzhi education taking "Charming Robot" as an example, It plays an exemplary role and popularizes the application value for the general education course of "engineering".

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