Research on the Teaching Effectiveness of Artificial Intelligence Technology and Application Courses under the Background of Industry Education Integration

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Abstract: *Due to the separation of the teaching mode theory and practice used in artificial intelligence technology and application courses in China, the quality of course teaching is poor. Therefore, the research focuses on the teaching effectiveness of artificial intelligence technology and application courses in the context of industry education integration. Firstly, a comprehensive discussion was conducted on the teaching design of artificial intelligence technology and application courses in the context of industry education integration from the perspectives of teaching objectives, teaching content, and teaching modes. Then, two classes in a certain university were used as experimental subjects, and project-based teaching mode and traditional teaching mode were used for experimental teaching under the background of industry education integration. The experimental results verified that project-based teaching mode is more suitable for teaching artificial intelligence technology and applied courses than traditional teaching mode, and the teaching effect is good.*

Keywords: *Background of integration of industry and education; Artificial Intelligence Technology and Application Course; Teaching mode; Teaching effectiveness*

1. Introduction

With the continuous development of science and technology, artificial intelligence technology has gradually become an important force to promote social progress, and has made major breakthroughs in the application of various fields in China, which has promoted the rapid development of Chinese society. In order to meet the development needs of artificial intelligence technology, the Chinese government attaches great importance to the training of artificial intelligence talents in colleges and universities, and has set up artificial intelligence related courses in colleges and universities across the country to gradually promote artificial intelligence education. Today, the course of artificial intelligence technology and application has become one of the key public courses for training artificial intelligence talents in Chinese universities, which has brought great opportunities and challenges for the basic education and reform of colleges and universities. Because of Artificial Intelligence Technology and Application course is an emerging comprehensive course, covering many subject fields such as computer science, mathematics, cybernetics, etc. If according to the traditional teaching mode in China, teachers teach students about theoretical knowledge related to artificial intelligence technology face to face in class, it is difficult for students to deeply understand relatively abstract artificial intelligence knowledge within a limited time. In addition, there is no more practical practice experience, resulting in poor learning effect of students on artificial intelligence technology and application courses. Therefore, under the background of the integration of production and education, this paper studies the teaching and teaching effects of artificial intelligence technology and application courses, providing a theoretical basis for the transformation and upgrading of Chinese universities.

2. Teaching design of artificial intelligence technology and application course under the background of integration of production and education

2.1 Design of teaching objectives

In order to highlight the multifaceted significance of artificial intelligence technology and

application course teaching in the context of industry education integration, and to provide a theoretical basis for the research of course teaching effectiveness, this chapter will provide a detailed explanation of the design of teaching objectives for Popularize and train artificial intelligence knowledge and skills and application courses in the context of industry education integration[1]. The integration of industry and education, in simple terms, is the integration of the social industry system and the teaching system of universities. This way, universities can integrate regional advantageous resources when carrying out artificial intelligence technology and application courses, and provide practical talents for China's socio-economic development. So, when designing the teaching objectives of artificial intelligence technology and application courses in the context of industry education integration, this article is mainly divided into three levels of objectives: professional knowledge and skills, innovative thinking, and values [2]. One of the practical significance of carrying out artificial intelligence technology and application course teaching in colleges and universities is to popularize artificial intelligence related knowledge for college students, and then cultivate professional talents for the society. So when formulating teaching objectives, it is necessary to let students fully master the basic theory and application skills of artificial intelligence. In order to achieve this goal, the teaching content should be from shallow to deep, including basic concepts, development process and main technology, but also involves practical operation and practical application. In this process, students can not only understand the basic principles of artificial intelligence, but also practice and deepen their understanding. Then there is the teaching goal of innovative thinking. With the passing of time, the logical thinking and cognition of Chinese college students have entered the stage of form operation, and they not only have the ability to learn the content taught by teachers, but also know how to think actively. Therefore, when colleges and universities carry out the teaching of artificial intelligence technology and application courses under the background of the integration of industry and education, the main goal is to stimulate students' practical and innovative thinking. Allow students to integrate the theoretical knowledge taught by teachers with practice in practical projects to create products with practical value. The main purpose of college education is not only to cultivate students' ability of artificial intelligence technology, but also to enhance students' sense of social responsibility and professional accomplishment. Therefore, this paper takes values as the last teaching goal to encourage students to take social responsibility and strictly follow social standards while applying the professional technology and ability they have learned scientifically.

2.2 Teaching content design

In the context of the integration of industry and education, the design of teaching content is crucial when universities carry out courses on artificial intelligence technology and applications[3]. At present, the courses on artificial intelligence technology and applications in Chinese universities are mainly based on school-based textbooks. From a comprehensive point of view, the textbooks suitable for the public courses of artificial skills technology and application are mainly as follows: The first is intelligent Question Answering and deep Learning, which takes intelligent question answering system as the entry point and introduces the basic principles and applications of deep learning in a simple way. It not only covers the basic knowledge of deep learning, but also has strong practicability, which can help students quickly get started and master the application of deep learning in intelligent question answering and other fields. The second is "Deep Learning", which systematically expounds the historical background, basic principles, algorithm models and other aspects of deep learning. It is rich in content, clear in structure, and pays attention to the combination of theory and practice, which can help students deeply understand the essence and application prospects of deep learning. Based on the teaching content and knowledge related to the integration of industry and education in the aforementioned textbooks, this article describes the design of teaching content for the course of artificial intelligence technology and applications [4].

In order to ensure that students fully master the basic theory and application skills of artificial intelligence, the teaching content should be from shallow to deep, including basic concepts, development process and main technologies, but also involving practical operation and practical application. At the same time, it emphasizes the cultivation of practical ability and innovative thinking. Through cooperation with enterprises, introducing real cases and projects, and encouraging interdisciplinary integration, students can deeply understand the application scenarios and actual needs of artificial intelligence technology, and cultivate their ability to solve practical problems. In addition, the teaching content also pays special attention to guiding students to pay attention to issues such as ethics, privacy and social impact of AI, and cultivate their correct values and social responsibility. Through this comprehensive design of teaching content, it aims to cultivate high-quality talents with solid professional knowledge, and a high sense of social responsibility and innovative spirit.

2.3 Teaching model design

At present, the teaching mode of artificial intelligence technology and application courses in China is mainly based on teachers imparting theoretical content in the classroom. Due to the relatively dull theoretical content of this course, it is difficult for students to arouse learning interest, which affects the teaching effect. Therefore, in the context of the integration of industry and education, this article proposes a project-based teaching mode to carry out theoretical and practical teaching of artificial intelligence technology and application courses [5]. The project-based teaching model is a teaching model that extends from the action-oriented education concept. The core of this teaching model is the application of actual artificial intelligence technology projects. Teachers design the actual projects according to the teaching objectives into projects that match the theoretical knowledge content learned by students, and hand them over to students for practical learning after class.In the whole project-based teaching mode of artificial intelligence technology and application courses, teachers are no longer the leader, but students are the main body. Teachers only need to be good designers and leaders. After teaching students theoretical knowledge and assigning practical tasks, they hand over the class to students and let them independently complete teaching activities such as searching materials, making plans, cooperating and discussing, and implementing projects. In this way, students can not only grasp the theoretical knowledge of artificial intelligence technology and application courses more firmly, but also cultivate their practical and hands-on abilities through practical projects, so that students can adapt to the working atmosphere of enterprises more quickly after leaving school and entering society. Therefore, under the background of the integration of production and education, this paper designs a project-based teaching mode for the teaching of artificial intelligence technology and application courses, which is not only conducive to the improvement of students' comprehensive quality, but also can train professional talents truly needed for social enterprises, thus promoting the progress of artificial intelligence technology in China.

3. Teaching experiment and effect analysis of artificial intelligence technology and application courses

3.1 Experimental subjects and procedures

To verify the actual teaching effect of the project-based teaching model designed in this article in the context of industry education integration in the teaching of artificial intelligence technology and application courses, this chapter selects a full-time general vocational college in China as the experimental school, and takes two first-year students in the school who have similar initial learning styles and academic performance dimensions as the experimental subjects. They are set as experimental class and control class, respectively. Among them, when students in the experimental class and the control class learn the course of artificial intelligence technology and application, there is little difference in the current level. Both the average score of students and the pass rate and excellence rate of students are relatively close, which further indicates that the score distribution of students in the two classes is relatively consistent, and can be used as the experimental object of the course teaching of artificial intelligence technology and application.

Then, using the teaching design described above in the text, the teaching practice of artificial intelligence technology and application courses is arranged. In the autumn of the first year of the two classes, students plan to complete 8 hours of teaching every day. The experimental class adopts project-based teaching mode, while the control class adopts traditional teaching mode. At the same time, to avoid the influence of irrelevant variables on the experimental results. Both classes adopt completely consistent teaching content and environment.

3.2 Analysis of results

After completing the teaching experiment of artificial intelligence technology and application course according to the content in the previous chapter, in order to quantitatively understand the teaching effect of artificial intelligence technology and application course of students in the experimental class and the control class, this paper specially customized a set of test questions according to the teaching content of the course, and conducted a summative course assessment on the students in the experimental class and the control class. According to the test results of the two classes, the teaching effect of artificial intelligence technology and application course was judged. In order to visually present the differences between the test scores of students in the experimental class and the

control class, the box chart of test scores for students in the experimental and control classes as shown in the Figure 1.
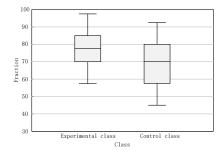

Figure 1: Box chart of test scores for students in the experimental and control classes

Box chart is a data display method that can describe the distribution of student performance data in a relatively stable manner, where the height of the box reflects the fluctuation of student performance; The upper and lower limits of the box represent the highest and lowest scores of students' grades, respectively; The median line of the box represents the average score of a class of students. From the above figure, it can be seen that after a semester of teaching practice in artificial intelligence technology and application courses, although the pass rate and excellent rate of students in both classes have improved compared to the bottom test. However, compared with the control class implementing traditional teaching models, the experimental class implementing project-based teaching models far outperforms the control class in terms of maximum and minimum student scores, as well as the median reflecting the average level of student performance. Therefore, the project-based teaching model in the context of industry education integration is more suitable for teaching artificial intelligence technology and application courses than traditional teaching models. Its actual teaching effect is good and can significantly improve students' academic performance.

4. Conclusion

Under the background of the integration of production and education, the teaching effect of artificial intelligence technology and application courses in Chinese universities is affected by many factors. This paper significantly improves the teaching effect of artificial intelligence technology and application courses and the comprehensive quality of students through reasonable design of teaching objectives, teaching content and teaching mode. In the future, with the continuous development of artificial intelligence technology and the constant change of social needs, the teaching content and methods of artificial intelligence technology and application courses still need to be constantly updated and improved. At the same time, strengthening the in-depth cooperation with the industry and exploring more flexible and diverse teaching methods are also important directions for future development.

Acknowledgements

References

[1] Zhang Ping,Cui Qimei,Hu Zheng,et al. For Deep Integration of Research, Industry, and Education, Construction of "Artificial Intelligence in Wireless Communication" High-tech Curriculum[J]. Research in Higher Education of Engineering, 2022(06):14-18.
[2] WU Fei, WU Chao, ZHU Qiang. Integration of Science and Education and Collaboration between Industry and Education to Promote the Cultivation of Innovative Talents in Artificial Intelligence[J]. China University Teaching,2022(Z1):15-19.
[3] Zhang Jishu.Exploration on the Building of Practical Teaching Platform for Application-oriented Universities under the Background of industry and education Integration[J].Journal of Vocational Education,2021,37(03):57-61.
[4] ZHANG Yiping, GAO Yanfei, CHEN Xin. Higher Vocational Talent Cultivation for Packaging Planning and Design Specialties Group Based on Industry-Education Integration[J].Digital Printing,

2021(04):41-49.

[5] HU Wanshan. Curriculum Implementation of Applied Universities from Perspective of Industry-Education Integration: Theoretical Conception, Realty Problems and Itself Solutions[J]. Heilongjiang Researches on Higher Education, 2022, 40(11):137-142.