

Reform and Practice of Introduction to Artificial Intelligence Course in Local Universities

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Abstract: In view of the current teaching characteristics and challenges in the teaching process of Introduction to Artificial Intelligence, this paper puts forward the curriculum reform schemes such as the "First Five-Year Plan" curriculum system, the addition of cooperative experiments, and the reform of diversified assessment methods. Combined with the teaching reform practice of Jiyang College of Zhejiang A&F University, the implementation process is expounded. The practice results show that the proposed reform measures can stimulate students' exploration consciousness and enhance their professional confidence.

Keywords: Introduction to Artificial Intelligence, Teaching reform, Scientific research training.

1. Introduction

At present, the economic and social development has encountered many complex problems to be solved urgently, and most of these problems involve knowledge in many fields, which cannot be solved by one discipline alone, especially the application of artificial intelligence in other fields. Colleges and universities must organically combine computer science with other multi-disciplines and comprehensively use the advantages of cross-disciplines, so as to completely eliminate the obstacles on the road of artificial intelligence, big data and Internet development. In 2018, the Ministry of Education requested in the Action Plan of Artificial Intelligence Innovation in Colleges and Universities to "guide colleges and universities to aim at the forefront of world science and technology, constantly improve the scientific and technological innovation, talent training and national international cooperation and exchange, etc.". For colleges and universities, especially local colleges and universities artificial intelligence majors cultivate innovative talents under the background of new engineering era. A new solution is put forward.

Twenty-one the development momentum of artificial intelligence technology in the 21st century is advancing by leaps and bounds. Study As a new trend of scientific development, cross-discipline is made by artificial intelligence. For the characteristics of the times of today's scientific and technological development, the development of science and technology and human. It plays an extremely important role in social progress. Local colleges and universities, we should grasp the good opportunity of forward development and vigorously promote the undergraduate course. Curriculum reform and professional construction, actively implement reform measures, cultivate talents conducive to social development. At this stage, in order to meet to cultivate undergraduates with engineering ability, it is necessary to take courses as realize the standard carrier, reform the teaching methods and methods, so as to implement the ability training process into the curriculum.

2. Challenges Faced by The Current Course of Introduction to Artificial Intelligence

Introduction to Artificial Intelligence is a compulsory course offered by the School of Computer Science and Engineering/College of Artificial Intelligence for freshmen majoring in intelligence science and technology and artificial intelligence. The course is a basic course of intelligent science and technology and artificial intelligence. Due to the characteristics of the subject, the course content is comprehensive and involves a wide range of fields, which brings challenges to teaching. First, the course is cutting-edge and challenging, and it exists in the problems of rapid development of teaching content and quick iteration of knowledge points; Second, the curriculum has a difficult problem of wide range of teaching contents.

At present, the course of Introduction to Artificial Intelligence emphasizes on theory and ignores practice. Students often can't use what they have learned for practical training, and can't come up with an engineering solution goal, that is, "talk about theory empty, but can't do it by hand". Students alone can't solve this problem, so they need guidance and training in class. Although the teaching of the course includes theory and experiment, what students do is only theoretical verification experiment, and the comparative value of experimental course results is small, resulting in teachers and students not paying much attention to experiment. In addition, the practice process outside the curriculum is only monotonous, simple and outdated technology operation, and the practice time is short and not systematic, so students often take a cursory look to complete the task. Learning content and practice are not related to the reality of enterprises, so students can't get the training of engineering practice. Therefore, it is necessary to deepen the curriculum reform of artificial intelligence instruction [2-3].

3. Teaching Reform of Introduction to Artificial Intelligence

3.1 "135" curriculum system

According to the requirements of engineering education

certification, according to the characteristics of students in local colleges and universities, and with the aim of cultivating innovative talents, a "135" curriculum system with a center (student-centered), three dimensions (knowledge, ability and quality) and five constructions (teachers, teaching content, digital resources, practice platform and double-creation base) is constructed.

(1) The content construction of Introduction to Artificial Intelligence course. Following the new thinking of OBE based on learning output, and according to the progressive learning mode of theory-application-practice, the teaching content of the course is divided into three parts: the basic stage of theory (15 hours), adopting personalized teaching, inquiry teaching, flip teaching and other methods, and teaching theory based on learning behavior analysis system; In the frontier application stage (9 hours), introduce the latest frontier technological progress in the fields of machine learning, agents, natural language processing and robotics; In the training stage (8 hours), five comprehensive courses are designed for training, and one basic experiment and one comprehensive experiment are optional.

(2) Construction of teaching resources. We should innovate the teaching content and mode, and adopt the reform measures of "teaching, research and innovation". In addition, digital resources construction has been carried out, and 45 micro-vision frequencies, 6 documents in related fields, 12 classic cases and 90 academic papers have been built. Increase the resources related to ethical education of artificial intelligence and deepen the connotation of curriculum ethics.

(3) Build a practice platform. With the help of "Baidu Cloud Artificial —Intelligence Laboratory" and "Blue Pigeon-Intel Embedded Artificial Intelligence Training Room", the college has provided a practical environment for the course. In recent three years, there were 345 undergraduate students, and after-school scientific research activities were carried out closely around artificial intelligence on the above experimental platform.

(4) Course content and organization and implementation. The course is organized and implemented according to the knowledge system based on "theory-application-experiment", with teachers' teaching as the leading factor, scientific research projects as the driving factor, and students' actual learning results as the core. Task-driven teaching is carried out based on PBL teaching mode, with goals set and tasks defined, and teachers issue learning materials and documents in advance, and issue classroom tasks; According to the teaching objectives of the course, students learn in class with the principles of autonomy, practicality and creativity; Online and offline mixed teaching and learning [4], using the method of combining network resources with classroom teaching; The model of "example demonstration+group discussion+frontier expansion" is adopted, and students learn together in groups to stimulate their interest in learning.

3.2 Curriculum supporting experiment and examination reform

(1) add collaborative project training. At present, the supporting experimental courses are all completed by students independently. Although the students' subjective initiative has been brought into play, the team spirit has not been strengthened. Therefore, according to the characteristics of the curriculum, some team tasks that must be completed by students in free groups are added, which can cultivate students' team cooperation ability. Team communication is an important way of team cooperation, and it is also an essential

skill for students to cooperate in their future work. Guiding students to cooperate with each other to complete the supporting experimental system has further strengthened students' cooperative ability and independent innovation ability, and also strengthened their team spirit.

(2) Reform the examination method of course experiment. According to the OBE concept, the multi-evaluation system is adopted to assess the course, and timely feedback is made to the final assessment of the course. The assessment method includes classroom participation (accounting for 10%), and students' participation and performance in all aspects of the classroom (classroom questioning, in-class tests, etc.) are evaluated (among which students' mutual evaluation accounts for 60%); Classroom task completion (accounting for 20%), evaluating students' achievements in classroom tasks (such as mind maps, presentations, etc.) (among which students' mutual evaluation accounts for 60%); Achievements (accounting for 30%), 10% of experiments, 15% of practical training and 5% of actual competitions; Final exam (accounting for 40%), showing students' achievement according to OBE philosophy.

At the beginning of class, the teacher told the students that they should know the assessment methods and standards of the course in advance, arouse the students' attention to practical ability, and actively implement the course standards in the learning process. This assessment method, which focuses on the cultivation of practical ability, can enable students to make full use of current resources to gain more knowledge and practical effects. Students can feel that they are integrated into the classroom, and effectively improve their pioneering thinking.

4. Curriculum Evaluation and Reform Results

Practice has proved that the reform and practice of Wuhan Institute of Technology in recent years have been well received by students. Team teachers are in the forefront of teaching evaluation in the school in recent two years, and many times of teaching evaluation are in the top 10% of the whole school. At the same time, the author counted the evaluation scores of Introduction to Artificial Intelligence course in recent years. It can be clearly seen that the number of people in each score range changes. On the whole, the scores of computer science and technology majors in 2016, 2017 and 2018 meet the normal distribution, which shows that the difficulty level of courses can be accepted by most students after reform and innovation. From the distribution ratio of each grade in the high score range of 91~100, the number of computer science and technology majors in 2016 in the high score range accounts for about 4.23% of the total number; The number of computer science and technology majors in grade 2017 in the high score range accounts for about 27.84% of the total number; Grade 2018 Computer Science and Technology Specialty□the number of people in the high score range accounts for about 12.61% of the total number. Compared with the evaluation scores of 2016 computer science and technology major's artificial intelligence introduction course, after the reform practice, the students' understanding of the course is obviously improved, and the proportion of students in the high score interval is gradually increasing. In addition, it can be clearly seen that the median interval of each grade shows an upward change, which indicates that the reform and practice have certain

effects.

At the same time, under the guidance of the principles of broad-based, multi-crossing, interest-raising, strong ability and confidence-building, students take part in a variety of innovative and entrepreneurial competitions, including FIRA International Robot Soccer World Cup, National Robot Championship, "Huawei Cup" China College Students' Intelligent Design Competition, National College Students' Mathematical Modeling Competition, National Finals of National College Students' Digital Media Science and Technology Works and Creative Competition, National College Students' Computer Skills Application Competition, China University Computer Competition, etc. In the past three years, a total of 64 undergraduate students have been rewarded by various innovation and entrepreneurship competitions.

5. Conclusion

The "135" curriculum system was put forward by Wuhan Institute of Technology in view of the teaching characteristics and students' learning status of Introduction to Artificial Intelligence. At the same time, the curriculum reform scheme of supporting experiments of collaborative courses and diversified assessment methods was added, the teaching methods and assessment methods of courses were adjusted, the traditional subject barriers were broken, and collaborative project training was innovatively adopted. Practice has proved that the reform has enabled students to consolidate their comprehensive theoretical knowledge and strengthen their engineering practice training. Students can innovate independently, actively communicate with the team, and gain

good teaching results. At the same time, they stimulate students' exploration and knowledge, promote teaching reform, speed up the modernization of education, and explore an effective way to forge high-quality engineering talents for intelligence science and technology majors.

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