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Research on the Construction and Practice of Teaching Systems of New Engineering Computer Majors in Applied Universities Driven by Artificial Intelligence

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Abstract

With the rapid development of science and technology, artificial intelligence has penetrated into various fields, and has a profound impact on society and economy. As one of the core disciplines in the era of artificial intelligence, the computer major has cultivated senior applied talents who play an important role in promoting the innovation and application of artificial intelligence technology. However, there is the problem of the traditional computer teaching system cannot adapt to the rapidly developing era of artificial intelligence. Therefore, the construction and practice of computer teaching systems adapted to the intelligent age has become an urgent problem to be solved.

Keywords

Artificial intelligence
Application-oriented
New engineering in universities
Computer science major
System construction

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1. Introduction

As a cutting-edge technology, artificial intelligence is profoundly changing the production and working modes of all walks of life. In the field of education, the application of artificial intelligence is also increasingly extensive. Under this background, the training of computer majors is facing more complex challenges and opportunities. In order to meet the needs of the intelligent age, application-oriented colleges and universities need to constantly adjust the teaching system of computer majors to better cultivate the core quality and ability of students [1].

2. Adapting to the cultivation of core qualities and abilities of computer students in the intelligent era

2.1. Cultivation of innovative thinking

Innovation is the engine of scientific and technological progress, and in the field of computer, it is particularly important to train students to forge ahead and innovate. In teaching, teachers should focus on stimulating students' creativity, so that they can actively seek new solutions when facing problems. Through project-driven and practical activities, teachers can provide students with a more challenging learning environment and stimulate their

independent thinking and problem-solving skills. In the course design, teachers can introduce some creative projects to encourage students to propose and implement their own ideas [2]. For example, designing a novel application to solve a real social problem can both exercise students' technical skills and stimulate their innovative thinking. In addition, teachers can also use practical activities, such as participating in programming competitions, scientific and technological innovation competitions, etc., to provide students with a broader display platform [3].

2.2. Training of team cooperation skills

In the computer field, teamwork is a key factor in the success of projects, so it is essential to focus on cultivating students' teamwork awareness and skills in the teaching system. Through group projects and internships, teachers can encourage students to develop teamwork skills in collaborative work and improve their ability to play a role in a team. Group projects are designed to stimulate the collaborative potential of students and enable each member to bring out his or her strengths. For example, teachers can divide students into groups with different professional backgrounds and let them face a comprehensive problem together, so as to encourage them to learn to work together in an interdisciplinary environment. Cross-grade teams can also be introduced to promote communication between senior and junior students and form technical inheritance and team building [4].

3. Upgrading and construction of computer professional teaching system driven by artificial intelligence

3.1. Integration of artificial intelligence into the curriculum system

In order to make students better adapt to the needs of the artificial intelligence (AI) era, teachers need to fully integrate the relevant knowledge of artificial intelligence into the teaching and guide students to deeply understand the principles and applications of artificial intelligence. In terms of updating the curriculum system, teachers should adopt a positive attitude and integrate professional courses related to artificial intelligence, so that students can master artificial intelligence technology. In the specific course design, teachers can incorporate AI-related content into all stages of teaching, rather than only introducing relevant courses at the senior or graduate level [5]. For example, in the basic course, teachers allow students to establish a basic understanding of artificial intelligence by introducing basic concepts and algorithms of artificial intelligence, and in the advanced stage, teachers can set up more in-depth professional courses, such as machine learning, deep learning, etc., so that students can gain advance knowledge in more specialized fields [6].

3.2. Practice-oriented teaching methods

Artificial intelligence is a practice-oriented field, and the learning of theoretical knowledge needs to be combined with practical application. In order to better cultivate students' practical application skills, teachers should adopt practice-oriented teaching methods using project practice, internship, and other ways, so that students can apply artificial intelligence technology to practical problems and improve their practical application skills [7]. At the same time, teachers should pay attention to project practice, and guide students to apply their knowledge in practice and solve practical problems by designing challenging projects. For example, teachers can encourage students to participate in artificial intelligence algorithm design projects, so that they can experience the application of algorithms in practical scenarios in the project [8].

4. Integrating resources and building a multidisciplinary comprehensive practice and training platform

4.1. Mechanism building for interdisciplinary cooperation

In the field of higher education, in order to cultivate more well-rounded talents, universities urgently need to establish an interdisciplinary cooperation mechanism. The construction of this mechanism involves the introduction of professional knowledge in other fields, such as psychology, economics, etc., and the combination of computer expertise, so as to cultivate students' more comprehensive literacy. In order to achieve this goal, first of all, teachers need to clarify the correlation and complementarity between various disciplines. Psychology can provide the theoretical basis of humanized design for the training of computer professionals, while economics can help students better understand the value of technology application in the business environment [9]. Secondly, institutions should create programs that give students the opportunity

to learn and integrate this knowledge, either through interdisciplinary courses or by incorporating elements of expertise from other fields into the curriculum, so that students can form a more comprehensive cognitive structure in their learning. Lastly, universities should establish interdisciplinary research teams, so that experts from different fields can participate in projects together, and promote the cross-border integration of academic research. This mechanism will provide students with a broader knowledge horizon, making them more competitive in future work and research [10].

4.2. Construction of practical training platform

The construction of a practical training platform is crucial to the improvement of students' professional literacy. In order to better simulate the real working environment, teachers can use modern technology to build a practical training platform with realistic scenes. Teachers need to set real work scenarios on the platform, including various problems and challenges that may be encountered in the daily operation of enterprises, and combine virtual reality technology so that students can carry out practical operations in a simulated environment to improve their problem-solving skills [11]. At the same time, colleges and universities should establish close cooperative relations with enterprises, so that students can participate in real projects, and provide more practical opportunities for students so that they can better apply the theoretical knowledge they learned to practical work. In this process, students can also gain practical experience from the exchange with enterprise professionals and broaden their career vision. Lastly, in order to better evaluate students' performance in practice, teachers can design real-time feedback mechanisms and help students discover and improve their shortcomings through data analysis and mentor evaluation [12].

5. Building a school-enterprise cooperation platform and cooperating in personnel training

5.1. Mechanism construction of school-enterprise cooperation

In order to establish the long-term mechanism of school-enterprise cooperation, it is necessary to clarify the goal of cooperation and the responsibility of both sides in the process of mechanism construction. First of all, the goal of school-enterprise cooperation should be clear and specific, including the training of students' practical ability by the school and the acquisition of professional talents by the enterprise, so as to ensure that both sides can achieve the common desired effect in the cooperation. Secondly, the division of responsibilities between both sides should be clear, the school can be responsible for providing high-quality educational resources and training programs, while the enterprise can provide practical project support and opportunities [13]. By co-building laboratories and providing internship opportunities, the cooperation between schools and enterprises can go deeper and form a mutually beneficial relationship. For example, in terms of laboratory construction, schools can integrate their own research forces and jointly invest resources with enterprises to establish experimental environments that meet actual needs. In terms of providing internship opportunities, schools can carefully design internship programs according to the business needs of enterprises to ensure that students can obtain comprehensive skills improvement in practice [14].

5.2. Participation of enterprise mentors

At present, in school-enterprise cooperation, enterprise professionals should be actively invited as mentors for students and the participation of enterprise mentors should be promoted. This process not only allows students to better understand the challenges and opportunities in practical work but also provides the opportunity for enterprise mentors to have close contact with the younger generation and promote them to better understand the learning style and thinking mode of the new generation. The participation of enterprise mentors first requires the establishment of a close relationship between the school and the enterprise [15]. The school can invite enterprise professionals to participate in professional seminars and industry exchange activities so that both sides can establish a good foundation of mutual trust. At the same time, the school can carefully match tutors and students according to the professional needs of enterprises, ensuring that students can better develop their interests and potential under the guidance of tutors. The role of corporate mentors is not only to impart knowledge but also to guide career development, they can share practical

work experience, guide students to better adapt to the workplace, and provide students with advice in practical application in the workplace. Based on the construction of this mechanism, the link between schools and enterprises will be closer, and students can better integrate into the career field [16].

6. Researching and establishing a scientific and effective education and teaching evaluation system

6.1. The establishment of multidimensional evaluation indicators

In order to fully understand the development of students, teachers need to develop multidimensional evaluation indicators, covering knowledge level, practical skills, teamwork, and other aspects, so as to evaluate the comprehensive quality and potential of students from different angles and provide strong support for their personal development and future career planning. Teachers can assess students' mastery of the knowledge through examinations, assignments, classroom performance, etc. The examination can include multiple-choice questions, fill-in-the-blank questions, and problem-solving questions to comprehensively examine students' theoretical knowledge and problem-solving skills. In addition to theoretical knowledge, students should also have practical operation ability [17]. To this end, teachers can adopt the method of project evaluation, requiring students to complete practical projects and evaluate them. The projects can include simulation experiments, scientific research investigations, programming design, etc., to examine students' practical and problem-solving skills and innovation ability. In real life and the workplace, teamwork is crucial to the development of individuals. Therefore, teachers can evaluate students' teamwork through team project assessment, which can be group research or social practice, requiring students to work together in a team to complete tasks, and evaluate according to team performance and individual contribution [18].

6.2. Flexible and diverse evaluation methods

In order to make the evaluation better reflect the actual ability of students and avoid the one-sidedness of a single evaluation method, teachers should adopt flexible and diversified evaluation methods, so as to have a more comprehensive understanding of students' ability and potential and provide more effective guidance and support for their personal development. Teachers can evaluate students' mastery of theoretical knowledge through the examination, but in order to avoid the one-sidedness of a single evaluation method, teachers should set a variety of question types in the examination, including multiple-choice questions, fill-in-the-blank questions, and problem-solving questions. At the same time, teachers can also judge students' actual ability in combination with project evaluation, which can include simulation experiments, scientific research investigation, programming design, etc., and determine evaluation criteria according to the nature and requirements of the project, so as to reflect the actual ability of students [19]. In addition, internship reports are also an evaluation method that can be adopted. Based on internship reports, students can summarize and reflect on their internship experience, and show their experience and skills gained in the actual working environment. Internship reports can include internship objectives, work content, problems encountered, and solutions. In addition to the above methods, teachers can also use a variety of other evaluation methods, such as oral reports, group discussions, written essays, etc. Oral reports can examine students' oral expression and presentation skills, group discussions can assess students' teamwork and communication skills, and written essays can examine students' writing and critical thinking skill [20].

7. Conclusion

Driven by artificial intelligence, the teaching system construction and practical research of new engineering computer majors in applied universities have made remarkable progress. By training AI professionals with practical skills and innovative thinking, universities can better meet the needs of society for AI and promote technological innovation and social development. It is hoped that this study can provide some reference for the reform and development of teaching in related fields.

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Disclosure statement

The authors declare no conflict of interest.

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