

Exploration of Computer Course Teaching Reform in the Era of Artificial Intelligence

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ABSTRACT

In the era of artificial intelligence, information technology is reshaping the teaching pattern of computer courses at an unprecedented speed, which makes the traditional teaching mode of computer courses in colleges and universities difficult to meet the needs of intelligent and personalized education. Therefore, the teaching concept needs to be reformed in order to adapt to the rapidly changing technological environment, and to train talents with practical ability and innovative thinking. However, in reality, teachers' insufficient knowledge reserve and inadequate practical resources in artificial intelligence are all constraints of reform, so that it is difficult for teaching to effectively connect with industry needs. In order to solve the dilemma, it is urgent for colleges and universities to build systematic reform strategies, especially to strengthen teacher training to make up for the cognitive gap, and to build artificial intelligence experiment platforms to improve the quality of practical teaching, so as to cultivate high-quality compound talents who can cope with the complex challenges in the intelligent era.

KEYWORDS

artificial intelligence; computer courses; teaching reform; practical ability

The rapid evolution of artificial intelligence technology is profoundly reshaping the ecology of various industries, and the education system has also been pushed to the forefront of innovation in this wave of change. Computer courses are an important component of information technology education, if they still stick to the traditional knowledge inculcation model and ignore the forging of practice orientation and innovative thinking, they are bound to be difficult to match the stringent requirements of high-level technical talents in the intelligent era. What is more serious is that the technology in the field of artificial intelligence is changing rapidly, and the lag of the teaching content of computer courses is becoming increasingly prominent. If teachers cannot update their knowledge reserves simultaneously, the teaching quality will be limited. Facing this challenge, only by breaking the inherent framework, reshaping the teaching model, introducing intelligent education means, and promoting the dynamic optimization of the curriculum system can students improve their ability to cope with the complex technological environment.

1 The Significance of Computer Course Teaching Reform in the Era of Artificial Intelligence

The teaching reform of computer courses in the era of artificial intelligence not only helps to promote the transformation of education model from traditional teaching to intelligence and individuation, but also improves the practical ability and innovation ability of students, and makes them adapt to the development needs of artificial intelligence. Colleges and universities must pay attention to this.

1.1 Help to Promote the Transformation of Education Model from traditional Teaching to Intelligence and Individuation

The deep integration of artificial intelligence technology is reshaping the traditional model of computer course teaching, and make it evolve to a highly intelligent and personalized direction. The traditional classroom is teacher-centered, and the teaching pace and content are mostly set according to the class level, which leads to the neglect of individual differences and the homogenization of learning experiences. The intelligent education system driven by artificial intelligence can accurately analyze learning behaviors, knowledge mastery and interest tendencies through big data, and customize personalized learning paths for different students to make content difficulty and pace adjustment more in line with individual needs, and thus significantly optimize learning efficiency. With the intervention of adaptive learning technology, teachers' teaching strategies can be dynamically adjusted in real time, students with weak foundations can get targeted supplements, and those who make faster progress in learning can access more challenging content, thus breaking the shackles caused by the "egalitarianism" in the past. At the same time, the introduction of technical means such as virtual laboratory and intelligent question-answering system enables students to conduct the independent exploration and in-depth interaction anytime and anywhere, which greatly improves the flexibility and immersion of learning, accelerates the deep transformation of computer courses from rigid indoctrination to intelligence

and individuation, and constructs a more efficient and adaptive learning ecology.

1.2 Help to Improve Students' Practical Ability and Innovation Ability to Meet the Needs of Artificial Intelligence Development

The teaching of computer courses in the era of artificial intelligence focuses on the training of practical ability and the shaping of innovative thinking, which is in line with the urgent demand of the society for high-end technical talents. Traditional computer teaching focuses on theoretical indoctrination, but the practice process is often a formality, which makes it difficult for students to quickly adapt to the technical challenges in the real project environment. With the development of artificial intelligence technology, computer courses can rely on the intelligent experimental environment, AI programming assistant and automatic evaluation system to build a highly interactive and dynamic feedback learning mode. For example, intelligent code analysis tools can detect program logic in real time, accurately identify optimization spaces, and help to boost programming capabilities. The AI-driven simulation platform can simulate complex systems such as computer network architecture, data processing processes and deep learning training to enable students to accumulate practical experience and hone engineering quality in an approximate industrial environment. In addition, the AI-enabled open innovation platform can provide students with space for independent research and development, and promote technological exploration to a higher level. This kind of practice-oriented and innovation-driven teaching mode deepens students' ability to use technology, stimulates their independent thinking and creativity, enables talents to take the lead in the future artificial intelligence industry pattern, and promote scientific and technological breakthroughs and industrial innovation.

2 The Dilemma of Computer Course Teaching Reform in the Era of Artificial Intelligence

At present, the teaching of computer courses in colleges and universities is faced with some difficulties. For example, teachers find it difficult to teach effectively due to the lack of artificial intelligence knowledge reserve, and the insufficient practical teaching resources lead to the lack of real project training opportunities for students. Colleges and universities must take specific solutions.

2.1 It is Difficult for Teachers to Teach Effectively Because of Insufficient Artificial Intelligence Knowledge Reserve

The rapid development of artificial intelligence technology has put forward higher requirements for computer course teaching, and the existing teachers are facing many challenges in coping with this change. For a long time, the teaching content of computer courses mainly focuses on programming language, data structure, computer network and other aspects, and the theory of machine learning, deep learning, natural language processing and other cutting-edge technologies involved in artificial intelligence are complex and highly practical. But some teachers lack systematic learning and practical operation on them, so that they are unable to handle complex teaching. In addition, some universities and vocational colleges have limited investment in the training of artificial intelligence teachers, and teachers are limited by the theory of textbooks to be unable to fully expand the depth of courses, thus affecting the teaching quality and hindering the effective promotion of artificial intelligence education.

2.2 Students Lack Real Project Training Opportunities Due to the Lack of Practical Teaching Resources

The emphasis of artificial intelligence teaching lies in practical training, however, the lack of practical resources in colleges and vocational colleges makes it difficult for students to obtain truly immersive project training opportunities. The learning of artificial intelligence is based on huge data processing, complex model training and algorithm optimization. However, in many colleges and universities, the experimental environment is old and the computing resources are less, which is difficult to support high-intensity artificial intelligence experiments. For example, the training of deep learning models is often based on high-performance computing clusters or GPU servers, but most colleges and universities only have basic programming laboratories, which are difficult to host the large-scale data operation and algorithm iteration. In addition, the application of artificial intelligence involves a complex data ecology, but limited by data privacy, trade secrets and other factors, it is difficult for colleges and universities to obtain high-quality industry data, and students can only rely on simplified versions of small-scale data sets for experiments. It weakens the depth of technical learning, makes students lack enough experience in dealing with real business scenarios, and further affects students' employment competitiveness and scientific research expansion ability.

3 Computer Course Teaching Reform Strategies in the Era of Artificial Intelligence

In the era of artificial intelligence, colleges and universities must strengthen teacher training to improve teachers' knowledge level and teaching ability of artificial intelligence, and build artificial intelligence experiment platforms to provide students with more opportunities for practice and innovation, so that students can meet the development needs of the era of artificial intelligence.

3.1 Strengthen Teacher Training to Improve Teachers' Knowledge Level and Teaching Ability of Artificial Intelligence

In order to adapt to the computer course teaching in the era of artificial intelligence, it is necessary to promote the improvement of teachers' knowledge reserve and teaching ability. However, most teachers still lack expertise in the field of artificial intelligence, making it difficult for them to effectively guide students to deeply understand the technological frontier. Therefore, colleges and universities must regularly organize special training on artificial intelligence, and invite academic authorities, enterprise engineers and scientific researchers to teach, systematically analyze deep learning, computer vision, natural language processing and other technologies, and show their application in different fields through specific cases.

In addition, the accumulation of scientific research experience plays an important role in teachers' understanding of artificial intelligence technology. Colleges and universities should encourage teachers to participate in artificial intelligence research projects, and expose them to the details of algorithm optimization, data processing, and model training within a real research environment, so as to integrate the latest research findings into teaching. At the same time, industry application experience is equally important. Education units can set up teacher practice bases together with enterprises, and regularly arrange teachers to enter enterprises to learn about artificial intelligence engineering application, such as intelligent recommendation systems, automatic driving algorithm optimization, so that they can master the most cutting-edge industry cases. In addition, colleges and universities can also promote collaborative learning among teachers, such as the establishment of artificial intelligence teaching community to promote teachers from different disciplinary backgrounds to communicate with each other and form a teaching model of interdisciplinary integration.

3.2 Construct an artificial Intelligence Experiment Platform to Provide More Opportunities for Practice and Innovation

In order to implement the computer course teaching reform, it is necessary to build an efficient, flexible and practice-oriented artificial intelligence experiment environment. High performance computing infrastructure is the key to experimental teaching. Colleges and universities should build GPU server clusters or provide powerful computing support for training artificial intelligence model training with the help of cloud computing platforms, so that students can run deep learning models and optimize them efficiently in real environments. At the same time, it should develop an intelligent experiment management system, and construct the remote accessible online experimental environment, in order to effectively expand the learning boundaries of students, and make them carry out the developing and testing of artificial intelligence projects anytime and anywhere.

The construction of the experimental platform should fully consider the diversity and availability of data resources, provide data sets covering image, text, voice, video and other fields, and keep dynamic updates to meet the needs of different research directions. Colleges and universities should also establish data sharing platforms to promote the openness of experimental resources, so that students can freely call data for experiments, and creatively develop based on existing platforms. For example, the "open platform with AI as the topic" is set up to allow students to choose their own research direction, and combine the computing power and data resources of the experimental platform to carry out personalized artificial intelligence experiments, thus shaping a more independent and creative learning path.

The project-driven teaching model can effectively enhance the practical value of experimental teaching. Colleges and universities should deeply cooperate with enterprises to develop real application cases such as intelligent traffic analysis, automatic speech recognition, and personalized recommendation algorithms, so that students can gain practical experience close to industrial needs from the experimental platform. In addition, colleges and universities can organize artificial intelligence programming competitions, hackathons and other activities, and take the experimental platform as the basic environment for competition, so as to stimulate students' innovation potential and exercise their engineering practice ability under high-intensity challenges. Colleges and universities can also introduce the artificial intelligence simulation system to enable students to more intuitively understand the algorithm optimization process, thus enhancing the interaction and visualization of the experiment.

In order to realize the sustainable development of the experimental platform, universities should promote the cross-

campus sharing of artificial intelligence experimental resources, and build a joint experimental teaching system, so that students from different universities can share the experimental environment, which promotes the maximum utilization of resources. At the same time, automatic evaluation and intelligent feedback mechanisms, such as AI automatic scoring system, should be introduced to make an instant evaluation of experimental results and provide optimization suggestions, so as to improve the efficiency and accuracy of experimental teaching. The construction of open, intelligent and efficient artificial intelligence experiment platforms in colleges and universities will help to enrich the practical resources of computer courses, accelerate the transition of students from theoretical understanding to practical application, and promote the deeper development of artificial intelligence education.

4 Conclusion

The rapid evolution of artificial intelligence technology makes the traditional computer teaching mode more and more inadequate in the face of talent training needs in the new era, and the reform of computer course teaching is imperative. In order to narrow the gap between theory and practical application, the teaching content of computer courses should be adjusted dynamically following the technological change, and especially the practical teaching link should be strengthened. At the same time, it is also important to improve the professional quality of the teachers, so as to accurately grasp the frontier trend, effectively guide learners to build a deep theoretical foundation, and temper their flexible practical ability. Only in this way can colleges and universities shape compound talents with innovative thinking and technical insight, respond to society's increasingly urgent demand for artificial intelligence talents, and lay the foundation for the take-off of information technology industry.

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