Computer Software Course Teaching System Reform under the Background of Big Data and Artificial Intelligence

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Abstract. In the environment of big data and ethnic intelligence, there are new innovations in all walks of life, and various industries and fields have put forward higher requirements for talents. Especially in the emerging computer-related fields and industries, the requirements of various enterprises for computer professionals have gradually increased and increased. Revolutionary changes have taken place in computer education in universities. In this case, as an important place for training technical talents, universities need to effectively innovate and reform computer software teaching based on school-enterprise cooperation in order to train computer talents more suitable for the development needs of the era of big data and artificial intelligence. Therefore, the purpose of this article is to study the reform of computer software course teaching system in the context of big data and artificial intelligence. Conclusions are reached through data analysis, experimental research and other methods. The necessity of reforming the teaching system of computer software courses in universities under big data is analyzed. Then carry out analysis and research from teaching ideas, teaching content, curriculum evaluation and feedback adjustment, and resource construction. Experiments show that the reform of the computer software course teaching system accounts for 65.4% of the verification, and it is more applicable to students. The data in this article provides a reference for the reform of computer software course teaching system.

Keywords: Big Data, Artificial Intelligence, Computer Software Courses, Teaching Reform

1. Introduction

After entering the 21st century, the widespread popularity of computers and the global coverage of computer networks have made the methods and methods of human information exchange faster and faster. The realization of the "global village" method of transmitting information and the application of
science and technology brought by computers are also changing people's lives \([1,2]\). After entering the 1920s, the concept of big data has begun to enter the scope of human cognition, with cloud computing as its main content. Based on the continuous intelligence of computers, advanced technologies and products based on artificial intelligence applications have appeared in people's vision \([3]\). Big data technology can meet the statistical needs of massive information and data. During the analysis of large amounts of information data, big data technology can classify, identify and analyze them \([4-6]\). Improved accuracy of data analysis. In this process, big data technology can perform statistical analysis on data information. Compared with other technologies, its analysis accuracy has been significantly improved, thereby enhancing the practical value of data statistical analysis \([7]\). Big data is connected to actual smart projects. These smart projects are intelligently controlled by a computer, and then the computer feeds these data back to the big data system. This is the Internet of Things.

Artificial intelligence is not a specific technology, but a comprehensive technology involving a wide range of complex applications. As a common auxiliary tool, computer has been integrated into people's daily life, work and study, and computer network technology has become increasingly popular \([8,9]\). In this era of big data, big numbers and big media. Artificial intelligence is rapidly being applied and is on the rise. The main application direction is that artificial intelligence is more common in computer network applications. It uses anthropomorphic thinking and operating methods \([10-13]\). Automatically analyze, count, and sort large amounts of network data and information files in your computer. The fusion of artificial intelligence and software technology is an extension and innovation of computer technology. It represents a revolutionary embodiment of computer technology in the new era. By integrating artificial intelligence with tool software, it has played an important role in comprehensive optimization and simultaneous upgrades \([14,15]\). The widespread application of the Internet of Things has laid a solid foundation for the development of artificial intelligence. The development of artificial intelligence has changed the traditional manual production method and redefined people's lifestyle and efficiency. Locally, artificial intelligence plays an irreplaceable role. Therefore, the development of artificial intelligence is the only method that must be taken in the context of the times and must not be violated.

Big data and artificial intelligence have been widely used in computer software, and they have an irreplaceable role. In the context of big data and artificial intelligence, as the network environment becomes more and more complex, new requirements are imposed on the application of computer software. Big data and artificial intelligence can adapt to these new needs and be able to process data more accurately. While improving work efficiency, it can also promote the development of other technologies. This article introduces the advantages of big data and artificial intelligence technology in computer software from the perspective of the era of big data and artificial intelligence and artificial intelligence, and discusses the specific application of artificial intelligence in the era of big data and computer software courses. Big data and artificial intelligence provide some help for the future development of computer software.

2. Method

2.1. Big data

With the popularity of the mobile Internet and the Internet of Things, the amount of data generated from different sources such as mobile terminals, social media and sensors is rapidly increasing. These
data with the characteristics of massive growth (Volume), heterogeneous multi-source (Variety), real-time high-frequency (Velocity), not only bring new challenges to traditional data storage and processing technology, but also propose analysis and processing some problems. Effective use of various organizations. Since the term "big data" has appeared, it has attracted attention from all walks of life, but there is no uniform definition. Because big data is a relative concept, the current definitions are all qualitative descriptions of big data, without clear quantitative indicators. Most domestic and foreign researchers have defined qualitatively big data from a macro-technical level. The Apache Hadoop organization defines big data as a set of data that general-purpose computers cannot capture, manage, and process within acceptable limits. The International Data Center (IDC) defines big data as a new generation of technologies and architectures designed to more economically extract value from high-frequency, large-capacity, and different structure types of data. The definition of big data by domestic scholars reflects the diversity and complexity of big data processing. Big data talents not only need good math, statistics, and computer expertise, but also strong professional industry knowledge to integrate big data into industry applications. Big data technology requires not only a lot of capital, but also a lot of knowledge and skills. Capital intensive means that the storage and processing of big data requires a large investment in computer hardware. Knowledge and skill-intensive means that big data analysis requires the participation of people with complex knowledge and skills, such as computers, mathematics, and communications.

2.2. Artificial Intelligence

Artificial intelligence originated in the 1950s. It can be said that it is a subject of computer science and the crystallization of wisdom in many fields such as computer technology, information theory, linguistics, and mathematics. Artificial intelligence can also be called intelligent simulation. It mainly uses computers to simulate human thinking logic. At present, artificial intelligence technology has been applied to various fields and has achieved great achievements. From the early 1970s to the mid-1980s, people began to frequently apply expert systems to various tasks. Expert system refers to the integration of human expert knowledge theory. The expression of these theoretical knowledge in other rules can be defined as the expert level in a specific field. The widespread application of expert systems also shows the recognition of artificial intelligence technology by society, and the application of artificial intelligence technology is becoming more and more proficient. However, the expert system can only be applied to professional areas that have more limitations and cannot be adjusted flexibly. Can solve some problems, but does not have the ability to summarize and optimize these solutions. In the mid-1980s, neural networks gradually entered people's lives. In the 1960s, the theory was basically formed, but due to lack of technology and funds, no modeling and testing were performed. It wasn't until the mid-1980s that enough technology was available to study neural networks again. In the 1990s, some scholars completed the connection between neural networks and the real world, plus fuzzy logic. After a short time, they completed the integration of neural networks and fuzzy logic in expert systems. Smart devices are capable of learning and fault tolerance.

3. Experiment

The development of big data and artificial intelligence education has proposed a diversified development of theoretical research, but it lacks a systematic explanation of computer software education theories, and lacks a clear definition of new concepts and new theories in the context of big
data and artificial intelligence. In practical applications, the combination of computer software practice and theory is not close enough. The lack of top-level educational theoretical design in the context of big data and artificial intelligence requires revolutionary theoretical guidance in computer software courses. In the computer software course system, instructional design can effectively link theory with teaching practice, and communicate these two functions closely. Therefore, we need to start from the deep level of computer software course teaching system reform and explore the impact of big data and artificial intelligence on instructional design in order to deepen the positive impact of big data and artificial intelligence on computer software courses.

The literature research method in this article mainly refers to the method of forming factual scientific knowledge through the collection, identification, classification and research of literature. This article uses the method of literature research to collate relevant research literature on big data and artificial intelligence education at home and abroad, affirming the necessity of reform of computer software teaching system. In order to have a certain understanding of the use of artificial intelligence by college students, this article specifically conducted a questionnaire survey on artificial intelligence and professional development of college students. Understand the age, interests, and career development of college students on the use of big data artificial intelligence, and can statistically deal with problems. According to the different content of the question, the frequency statistics and descriptive statistics of the problem are given, and the analysis results are given in the form of text, tables, statistical charts and so on. Using random sampling, 200 students from several institutions of higher learning were selected as survey objects. A total of 200 questionnaires were issued, with 189 valid samples and an effective recovery rate of 94.5%. Therefore, the data of this questionnaire is valid.

4. Discuss

Computer software courses are divided into three categories: confirmatory, design and comprehensive. An example of teaching courses is shown in Figure 1. It can be seen from Figure 1 that 65.4% of the experimental designs are valid, and the correctness and use of the knowledge points are verified through the computer debugging case program. 34.6% of the experiments were designed and comprehensive. Among them, design accounted for 15.5% and comprehensive accounted for 19.1%. And most of this part of the experiment is designed and applied according to the content specified by the teacher, which lacks the students' active choice and innovation, which leads to the students completing it just for completion. The assessment of the course is mainly through the understanding and mastery of knowledge points through testing, without evaluation of the learning process. In the context of big data, the content and methods of experiments and the methods of assessment must be innovative. For the experiment, the content of the experiment should be designed with the active participation of the students, combined with the characteristics of the curriculum, current computer hotspots, and students' points of interest, and statistical analysis to unearth the topics of high student interest and high participation as experimental content. Reform, students must have a basic grasp of the knowledge of the curriculum. As for the assessment method, it focuses on the entire process of learning, divided into chapters, knowledge points, designing test methods and content to check the degree of students' mastery, combined with the final exam, comprehensive evaluation.
From the degree of interest in computer software in Table 1, we can see that among the college students who participated in the questionnaire survey, more than 184 samples were "male". The proportion of female samples is 8%. Those who are interested are 18.5%, those who are not interested are 9.5%. Neutral is 57% and generally 15%. It can be seen that students who choose computer majors are not very interested in computer software. Another 76.5% of the students' understanding of artificial intelligence is "general understanding", which indicates that artificial intelligence is not widely used in teaching. There are even very few students who do not know about artificial intelligence at all, indicating that artificial intelligence still has some way to go before it can be widely used. Although I have learned that I have not been optimistic about the situation of artificial intelligence, as the mainstream trend of future development, artificial intelligence has been recognized and supported by most students.

Table 1. Interest in computer software courses

|     | Interested | Average | Neutral | Not interested |
|-----|------------|---------|---------|---------------|
| 18.5% | 15%        | 57%     | 9.5%    |

Computer software reforms in the era of big data and artificial intelligence are designed to increase student interest. The reform of knowledge in computer software courses is not only a demonstration of personal ability, but also a brand-new teaching perception based on students' personal portraits. What we should have is the ability to quantify students' personal indicators. Quantification is a term often mentioned in the era of big data and artificial intelligence, so how to quantify the personal characteristics of students has become a problem that computer software curriculum system reform should face in the background of big data and artificial intelligence. The subjective evaluation made by the performance of the student's personal classroom is very subjective. It is impossible to be convinced by the computer age and even the big data and artificial intelligence era. What should be displayed is a comprehensive evaluation and development of individual characteristics of students. What it should have is a special look and feel in the era of big data and artificial intelligence, including students. Students are independent people. The personal characteristics of their personality characteristics determine the teacher's teaching methods and the perception of teaching.
The personal characteristics of students have profound significance to the teaching reform of big data model.

5. Conclusion

With the advantages of big data and artificial intelligence technology, the application of artificial intelligence in computer network technology in the context of the big data era is of great significance to computer intelligence. Artificial intelligence technology has been better applied in computer software courses. The unique high efficiency, accuracy and simplicity of big data and artificial intelligence have made great contributions to the development of computer network technology, thus promoting the innovation and development of the entire computer software course. This article explores the influence of big data and artificial intelligence on the elements of computer software teaching design one by one, and proves that the computer software curriculum teaching design paradigm has been transferred under the background of big data and artificial intelligence. According to the characteristics of computer software courses and students' characteristics, more flexible teaching goals are adopted, and teaching behaviors and decisions designed using overall thinking are more scientific and regular, and more in line with students' learning behavior habits. It enables students to better self-individualized learning and experience the fun brought by computer software courses, thereby achieving greater improvement in learning. Combining students with big data and massive teaching resources, comprehensively analyze and research, deepen the reform of computer software course teaching, and provide positive guidance for the improvement of students' computer ability.

References

[1] Shuxia, W., Qian, Z., & Xupeng, C. (2017). Multiple practice teaching reform of product mapping course. Journal of Graphics, 38(3), 453-457.

[2] Zhang, Y. (2017). On study of teaching reform of organic chemistry course in applied chemical industry technology. IOP Conference Series Earth and Environmental Science, 94(1), 012069.

[3] Mayer, B., Braisch, U., Meule, M., Andreas Allgöwer, & Muche, R. (2018). Effect of data self-collection as an activating teaching method in a statistical software course in biostatistics - a pilot study. GMS Zeitschrift für medizinische Ausbildung, 35(1).

[4] Miao, C., Yong-Jia, C., Er-Dong, D., Chang-Hang, D., Fan, F., & Kai-Min, G., et al. (2017). Teaching reform and practice of organic chemistry laboratory course based on “synthetic methodology”: taking preparation of ethyl benzoate as an example. University Chemistry, 32(7).

[5] Trent, J. (2018). ‘fitting in’ or ‘being different’ integration, separation, and identity construction during a teaching practicum in hong kong. Teacher Development, 22(4), 1-16.

[6] Jing, Y., Bian, Y., Hu, Z., Wang, L., & Xie, X. Q. S. (2018). Deep learning for drug design: an artificial intelligence paradigm for drug discovery in the big data era. The AAPS Journal, 20(3), 58.
[7] Akyeampong, K. (2017). Teacher educators’ practice and vision of good teaching in teacher education reform context in Ghana. Educational Researcher, 46(4), 194-203.

[8] Boyte, H. C. (2017). John Dewey and citizen politics: how democracy can survive artificial intelligence and the credo of efficiency. Education & Culture, 33(2), 13.

[9] Susan, N. S. (2019). The role of big data and machine learning in the integration and implementation of historical, current, and continuously gathered earth data. ACTA GEOLOGICA SINICA (English edition), 93(z1), 56-58.

[10] Syeda-Mahmood, T. (2018). Role of big data and machine learning in diagnostic decision support in radiology. Journal of the American College of Radiology, 15(3), 569-576.

[11] Foulquier, N., Redou, P., Gal, C. L., Rouvière, Bénédicte, Pers, J. O., & Saraux, A. (2018). Pathogenesis-based treatments in primary Sjogren’s syndrome?using artificial intelligence and advanced machine learning techniques: a systematic literature review. Human Vaccines & Immunotherapeutics, 1-18.

[12] Shu, K., Sliva, A., Wang, S., Tang, J., & Liu, H. (2017). Fake news detection on social media: a data mining perspective. ACM Sigkdd Explorations Newsletter, 19(1).

[13] Liu, H. (2018). The research of theoretical construction and effect of preschool wisdom education system in the background of big data. Cluster Computing(2), 1-7.

[14] Ali, N. M., Shah, H. A. R., Shukor, S. A., Mutalib, L. A., & Nor, M. M. (2018). The shariah and law education in Malaysia in the context of legal practice. Journal of Computational and Theoretical Nanoscience, 24(1), 398-400.

[15] Yong, L. I., & Bao-Wen, C. (2018). On the concept of education in the context of informationization and the optimization path. Medicina Oral Patologia Oral Y Cirugia Bucal, 13(7), E456-9.