Research on the reform of artificial intelligence digitalization in colleges and universities

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Abstract: With the development of the times, the society pays more and more attention to talent cultivation. As an important place for talent cultivation, college teaching is very important. In recent years, the digitalization of artificial intelligence is the focus of technical development in various industries. Therefore, the reform and research of college teaching under the digitalization of artificial intelligence can better cope with the development of the industry. Based on the analysis of the present situation and existing problems of teaching in colleges and universities, as well as the development and application of artificial intelligence digitalization in all walks of life, this study explores the development and influence of artificial intelligence digitalization in colleges and universities, and provides a reference for the teaching reform in colleges and universities.

1. Introduction

With the development of the times, the demand and requirements of society for talents are getting higher and higher. As an important institution for talent training, the teaching quality and effect of colleges and universities are particularly important. According to the development of teaching in colleges and universities, the government has put forward a series of policies and measures aimed at improving the quality of training in colleges and universities, such as the implementation of "double-first-class" construction and the construction of characteristic colleges and universities, encouraging colleges and universities to optimize their specialty settings and curriculum systems and cultivate high-quality talents that meet the needs of society. The government encourages colleges and universities to strengthen innovation and entrepreneurship education and cultivate students' innovative spirit and entrepreneurial ability[1]. For example, the pilot reform of innovation and entrepreneurship education, the establishment of innovation and entrepreneurship scholarships and other government-supported first-class curriculum construction will promote the improvement of curriculum quality in colleges and universities. The construction of first-class courses aims to stimulate teachers' teaching enthusiasm and cultivate a number of high-quality courses with international leading level and meeting the needs of national development strategy[2]. However, there are some problems and challenges in college teaching, such as single teaching method, insufficient teaching resources and students' lack of practical opportunities[3]. The

application of artificial intelligence digital technology can bring new opportunities and solutions for college teaching. In recent years, the digital technology of artificial intelligence has been rapidly developed and applied, which has had a far-reaching impact on all walks of life. Therefore, it is of great significance to discuss the application and development of artificial intelligence digitalization in college teaching, which can better meet the needs of industry development and improve the quality and effect of college teaching. In order to better cope with the development of the industry, this study analyzes the present situation and problems of college teaching, and discusses the application and development of artificial intelligence digitalization in college teaching, which provides reference for college teaching reform[4].

2. The present situation and existing problems of college teaching.

With the development of the times and the improvement of the university system, university teaching has been continuously improved in discipline construction, which not only covers a wide range of disciplines, but also promotes the intersection and integration of disciplines. In terms of scientific research, the gradual integration of high and new technology in university teaching has continuously improved scientific research teaching, which provides a solid support for improving teaching quality, and at the same time provides students with better opportunities for practice and research to meet the needs of society for talents; In addition, colleges and universities gradually attach importance to practical teaching, and strengthen experiments, internships, social practice and other links, which is conducive to improving students' practical ability and adaptability. However, there are also some problems in the development of college teaching. According to the analysis of the above-mentioned status quo of college teaching, there are the following problems in college teaching[5]:

The lack of overall planning and layout of teaching leads to the lack of effective integration and coordination of teaching in various majors; In the teaching of colleges and universities, the links between various professional courses are not close enough and there is a lack of overall planning. As a result, it is difficult for students to effectively integrate and coordinate the knowledge in different professional fields in the learning process, and they lack the overall teaching planning and layout, which makes it impossible to form a complete knowledge system and affects their future career development. Therefore, colleges and universities need to make an overall teaching plan that runs through students' learning career from the overall perspective, so as to form an organic connection between professional courses and improve teaching effect, which is very important for college teaching[6].

Teaching fails to fully reflect the characteristics of our school and lacks personalized teaching plan and curriculum design; Different colleges and universities have their own characteristics and advantages. However, different colleges and universities have their own unique characteristics, which are not fully reflected in the teaching plan and curriculum design. As a result, it is difficult for students to get in touch with the knowledge and skills related to the school's characteristics during their school days, thus lacking competitiveness in the future job market. Therefore, colleges and universities should make personalized teaching plans and curriculum designs according to their own actual conditions and related high-tech development, and integrate their own characteristics and advantages into daily teaching, so as to improve students' comprehensive quality[7].

Teaching pays too much attention to the transmission of theoretical knowledge and ignores the cultivation of practical ability and innovative spirit[8]; Under the traditional teaching mode, colleges and universities often pay too much attention to the teaching of theoretical knowledge and neglect the cultivation of practical ability and innovative spirit. This teaching method has been unable to meet the demand for talents in modern society. Therefore, colleges and universities should change their ideas and strengthen the proportion of practical teaching in order to cultivate students' practical ability

and innovative spirit[9].

Lack of intersection and integration with other disciplines limits the cultivation of interdisciplinary talents; Interdisciplinary talents have always been the focus of the development of various disciplines, which is an important way to promote professional development[10]. However, in the teaching of colleges and universities, there are still problems of insufficient intersection and integration with other disciplines. It not only restricts the cultivation and development of interdisciplinary talents, but also affects the improvement of students' comprehensive quality. Therefore, colleges and universities should constantly strengthen exchanges and cooperation between different disciplines, promote the intersection and integration of disciplines, and provide a better teaching environment for cultivating interdisciplinary talents with comprehensive quality. By setting up interdisciplinary course and encouraging students to participate in interdisciplinary projects, we can cultivate students' comprehensive quality and innovative ability. At the same time, universities can also carry out cooperation and exchanges, share high-quality educational resources, and jointly promote the cultivation and development of interdisciplinary talents[11].

The management concept is backward, and the traditional management process is followed; We can't make a teaching plan according to the actual needs of students from the reality of the school. At the same time, the management system of colleges and universities is not perfect, the implementation is not enough, and there are problems of weak standardization. Backward management methods lead to low work efficiency and bring great inconvenience to teachers and students. In addition, the management team is uneven, and teaching managers are generally ignored, lacking professional requirements and wages[12].

3. The development of artificial intelligence digitalization and its application in all walks of life

The definition of Artificial Intelligence (AI) is a new technical science to study and develop theories, methods, technologies and application systems for simulating, extending and expanding human intelligence. It is a combination of computer science, psychology, philosophy and other disciplines, aiming at understanding the essence of intelligence and producing a new intelligent machine that can respond in a similar way to human intelligence. Its research fields include robot, language recognition, image recognition, natural language processing and expert system, etc. The goal is to make the machine competent for some complex tasks that usually require human intelligence. Although artificial intelligence is not human intelligence, it can think like human beings, even surpassing human intelligence.

Artificial intelligence refers to the ability of machines to complete a series of complex tasks by simulating human intelligence, while the digitalization of artificial intelligence mainly refers to the technology of computers, Internet, cloud computing, big data, etc. The whole process includes converting continuously changing inputs, such as drawing lines, into separate units, which are represented by 0 and 1 in computers, and this conversion is usually performed by analog-to-digital converters(Figure 1)[13].

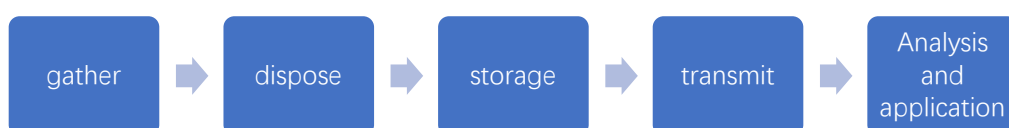gather → dispose → storage → transmit → Analysis and application

Figure 1: Digitization process of artificial intelligence

The development of artificial intelligence digitization is synchronized with the progress of

computer technology. From the exploration of whether computers can think like people in the 1950s, to the promotion of the Internet in the 1990s, and to the integration of big data, cloud computing and artificial intelligence technology in the 21st century, artificial intelligence digitization has been widely used in many fields, such as finance, medical care, education, manufacturing and so on. In the financial field, the digitalization of artificial intelligence can carry out risk assessment, and can also analyze the fluctuation of stock market and stock price, improve the accuracy and efficiency of decision-making through data operation, and enable investors to grasp the timing of market decision-making more accurately. At the same time, artificial intelligence can also help investors to formulate personalized investment strategies to achieve the optimal allocation of assets and maximize returns (Figure 2); In the medical field, by analyzing a large number of medical image data, normal and abnormal data are automatically distinguished, thus improving the accuracy of diagnosis (Figure 3). At the same time, natural language processing technology can be used to automatically analyze the medical record text to assist doctors in diagnosis. In the field of education, traditional education evaluation is usually carried out by teachers, which is subjective and requires a lot of time and energy. Artificial intelligence can provide students with more objective, accurate and efficient learning evaluation through intelligent learning evaluation, can assist teachers in teaching and realize students' personalized learning, and can provide students with personalized learning paths and learning resources according to their learning situation and interests. In addition, digitalization of artificial intelligence can promote interdisciplinary integration and innovation, for example, by analyzing students' learning history, subject interests and learning styles; In the manufacturing field, it can realize automatic production, quality control and supply chain optimization, quality control and overall optimization of supply chain. By introducing artificial intelligence technology, many links in the manufacturing process can be automated, thus improving production efficiency and reducing costs. For example, robots on automated production lines can complete various repetitive tasks, and intelligent monitoring systems can detect abnormal situations in the production process in real time and adjust them automatically. The development of artificial intelligence digitalization has gone through many stages from early exploration to logical reasoning, connectionism, machine learning and big data, and integration with other fields (Figure 4), and has achieved remarkable results, which has continuously promoted the progress and development of society[14].

Figure 2: Concept map of the development of artificial intelligence in the financial field

Figure 3: Concept map of the development of artificial intelligence in medical field

Figure 4: Development concept diagram of artificial intelligence in manufacturing field

4. The development and influence of artificial intelligence digitalization in college teaching.

4.1. The development of digital artificial intelligence in college teaching

The core connotation of artificial intelligence digital university teaching can be summarized as intelligence, intellectualization and intelligent evaluation. Specifically, using the adaptive and personalized characteristics of artificial intelligence technology, we can design teaching content that can meet different students' needs and hobbies, so as to improve teaching effect and students' participation. In addition, through the interactivity and real-time of artificial intelligence technology, intelligent teaching methods can be designed to improve the interactivity and effect of teaching; Using its automatic and intelligent characteristics, we can design an intelligent evaluation system that can improve the efficiency and accuracy of teaching evaluation. This core connotation can promote the reform and innovation of teaching in colleges and universities, improve the quality and efficiency of teaching, and cultivate more high-quality talents with innovative ability and practical spirit[15].

Digitalization has promoted the change of traditional education and teaching mode, and network

teaching and mixed teaching have become the new normal state of education. Artificial intelligence technology, such as adaptive system, AI assistant and automatic answering tool, makes the teaching process more autonomous, humanized, accurate and personalized. This not only helps to realize differentiated teaching, but also helps to realize personalized learning. With the support of artificial intelligence, colleges and universities are looking for new teaching and learning methods. For example, some experts advocate the implementation of "situational learning", so that students can truly experience various situations in learning and deeply understand different cultural and social environments. "Man-machine collaborative learning" is also a relatively common new model. Artificial intelligence technology can provide students with tailor-made learning resources and paths by analyzing learners' situation, learning diagnosis and evaluation. It helps to solve the dual needs of "individualization" and "scale" of education and learning, and also helps to reduce the digital divide and promote educational equity; In addition, in order to meet the needs of the development of artificial intelligence, colleges and universities should set up corresponding academic institutions or research institutions to teach artificial intelligence knowledge and courses. And realize the deep integration of artificial intelligence and multidisciplinary. This will not only help to apply artificial intelligence technology in college teaching, but also help to enhance the academic status and influence of colleges and universities in the field of artificial intelligence.

4.2. The impact of digital artificial intelligence on college teaching

The influence of digitalization of artificial intelligence on teaching in colleges and universities is mainly reflected in personalized learning, intelligent assistant teaching, automatic evaluation, intelligent resource recommendation, enhancing learning experience and improving educational fairness, etc. The influence is helpful to improve teaching quality and efficiency and promote educational fairness and development, and its specific effects are as follows:

Personalized learning: Digitization of artificial intelligence can help schools and educational institutions collect and analyze students' learning data, including information on academic performance, study habits, hobbies and so on. Through in-depth analysis of these data, teachers can better understand the learning characteristics of each student, so as to provide them with more targeted education programs. And with the support of learning algorithms and models, AI can quickly identify students' weaknesses and strengths, and provide corresponding learning content and teaching methods accordingly. This personalized teaching design enables students to master knowledge more efficiently, which is in sharp contrast with the traditional one-size-fits-all teaching method. In addition, the platform can recommend learning resources and activities suitable for students according to their learning data and interests, and provide personalized learning experience. At the same time, the platform can also provide real-time learning feedback and suggestions to help students adjust their learning strategies in time.

Intelligent Assisted Teaching: Digitalization of artificial intelligence can assist teachers in teaching management, answering questions, evaluating and other tasks, reduce teachers' burden and improve teaching efficiency. For example, intelligent speech recognition can help students practice oral English, and intelligent question bank can provide students with more learning resources.

Automatic evaluation: Digitalization of artificial intelligence can save teachers' time and energy and improve the accuracy and efficiency of evaluation by evaluating students' homework, exams and exercises.

Intelligent resource recommendation: Digitalization of artificial intelligence can recommend relevant courses, books, materials and other resources for students according to their learning needs and interests, and help students to better expand their knowledge.

Enhance learning experience: Digitalization of artificial intelligence can provide more

opportunities for students to interact and participate, such as virtual reality, online discussion, interactive games, etc., thus enhancing students' learning experience and interest.

Improve educational equity: Artificial intelligence technology can provide students with more learning opportunities and learning resources, and students can enjoy high-quality educational resources no matter where they are and what their family conditions are, thus improving educational equity.

4.3. Specific practice case analysis

According to the above research contents, this study combines man-machine collaborative learning, network education and mixed teaching mode to carry out experiments. The whole class is taken as the experimental group, with 53 students in each class, while the control group has 53 students in different classes. Before the new teaching practice, the ability of the students is tested by using college papers, and the final scores of the whole experiment and the control group are evaluated and analyzed after the whole course, and the data are analyzed. According to the research results, a questionnaire survey was conducted among 53 students in the experimental class. A total of 53 questionnaires were distributed online and offline, and the overall recovery rate was ninety-seven percent. According to the overall data analysis, more than 67.5% students were satisfied with the new teaching methods, and 84.3% students wanted to join the new teaching activities again. Perform tabular data analysis on the above contents (Table 1):

Table 1: Data Analysis

project	Experimental group (53 people)	Control group (53 people)
Pre-experimental ability test	Average score: X1	Average score: X2
Final grade after experiment	Average score: Y1	Average score: Y2
Satisfaction with new teaching methods	More than 67.5%	50.3%
Willingness to participate in new teaching activities again	84.3%	42.5%

5. Suggestions on teaching reform of digital colleges and universities based on artificial intelligence.

The digitalization of artificial intelligence has a far-reaching impact on the teaching reform in colleges and universities, especially in the establishment of interdisciplinary integration teams and high-tech research and development teams, and its development potential is huge. In the teaching of colleges and universities, knowledge among different disciplines is often independent of each other and lacks effective integration and exchange. The digital technology of artificial intelligence can integrate the knowledge and resources of different disciplines, form an interdisciplinary teaching system, and promote the cross-integration between different disciplines. At the same time, the digital technology of artificial intelligence can also provide students with more abundant and diversified learning resources and paths to help students better master knowledge and skills. In addition, it can promote the research and innovation of high technology, which is an important means to improve the teaching quality and effect in college teaching. The digital technology of artificial intelligence can provide more convenient and efficient ways and methods for high-tech research and innovation. For example, using artificial intelligence technology can automatically analyze and process a large amount of data and information, and improve the efficiency and accuracy of research and development; Using digital technology can simulate and test various experiments and schemes, and

reduce the cost and risk of research and development. According to the above research, this study will provide suggestions for teaching reform in colleges and universities based on the digitalization of artificial intelligence (Table 2):

Table 2: Suggestions on teaching reform of digital colleges and universities based on artificial intelligence

Specific suggestions	Suggested content
Formulate specific implementation strategies and system planning.	Colleges and universities should make long-term development plans, clarify the specific goals and paths of artificial intelligence digitalization in teaching, scientific research and management, and ensure the orderly progress of all work.
Invest a lot of money to support it	Colleges and universities should increase investment in the digital construction of artificial intelligence to ensure that the digital transformation of teaching, scientific research and management is supported by sufficient funds.
Establish interdisciplinary integration team and high-tech R&D team.	Colleges and universities should establish interdisciplinary teams composed of experts in education, artificial intelligence, data science and other fields to jointly promote the application of artificial intelligence digitalization in teaching.
Strengthen teachers' training on the digitalization of artificial intelligence.	Colleges and universities should strengthen the training and guidance of teachers, help them master the use of artificial intelligence digital tools, and improve the teaching quality.
Expand international cooperation.	Colleges and universities should strengthen exchanges and cooperation with their international counterparts, learn from advanced digital education experience of artificial intelligence, and enhance their education level and international influence.
Optimize the overall curriculum	Colleges and universities should combine the development of artificial intelligence technology, adjust the curriculum, increase courses and practical activities in related fields, and cultivate students' innovative ability and practical ability.

6. Conclusion

In the development of digital technology of artificial intelligence, college teaching can gradually improve and optimize teaching methods and means through continuous exploration and practice. Colleges and universities improve teaching efficiency and effect by strengthening the research and application of artificial intelligence digital technology and introducing advanced technology and equipment; Strengthen cooperation and exchanges with enterprises, provide students with more practical opportunities and resources through school-enterprise cooperation, and the application and development of artificial digitalization in college teaching is of great significance and role. Through continuous exploration and practice, colleges and universities can gradually improve and optimize teaching methods and means, improve teaching quality and effect, cultivate more high-quality talents, and contribute to the sustainable development of society.

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