Practice and Innovation of Informatization Teaching in Colleges and Universities under the Background of Big Data

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Abstract: Under the background of big data, information-based teaching in colleges and universities has had important development. From the perspective of theoretical correlation, big data is closely connected with university information teaching. In terms of practical strategies, we can optimize the allocation of teaching resources based on big data, make the use of resources more reasonable, use big data to improve the teaching process and teaching quality, and improve the learning evaluation system with the help of big data to make the evaluation more scientific. The innovation path includes teaching model innovation, creating more dynamic classrooms, teaching management innovation, improving management efficiency, teaching evaluation innovation, so as to measure teaching effect more comprehensively and accurately, and promote the development of informatization teaching in colleges and universities.

Keywords: Big Data; University Information Teaching; Practice and Innovation

Introduction

With the development of Internet information technologies such as artificial intelligence and big data entering the 2.0 era, information-based teaching has also been endowed with more and more characteristics of the 2.0 information age. With this, human society is facing the challenge of innovation in all aspects, and information technology such as big data has increasingly become an important tool to promote innovation and change in the industry. In the field of higher education in China, the teaching mode is also undergoing a major reform. "Big data + education" not only promotes the deep integration of big data into the education reform, accelerates the continuous innovation of personnel training mode, but also further promotes the storage, sharing and analysis of educational resources.

1. Theoretical correlation between big data and informatization teaching in colleges and universities

With the help of big data analysis theory, we can gain insight into students' academic behavior pattern and reveal their learning tendency and habit by analyzing multiple data such as their duration, frequency and answer performance in online learning [1]. Information communication theory plays a key role in this process. Big data technology has revolutionized the transmission of teaching information, made personalized recommendation possible, and ensured that students of different levels can receive educational resources suitable for them. It is also necessary to combine educational psychology with big data [2], and we can adjust teaching methods according to students' psychological characteristics and emotional fluctuations, so as to enhance teaching effectiveness.

2. Practical strategies of informatization teaching in colleges and universities under the background of big data

2.1 Optimize teaching resource allocation based on big data

Through the collection and in-depth research of students' behavioral data, such as their tendency towards majors, frequency of visits to courses and homework submission, students' preferences and learning needs can be more accurately grasped [3]. Based on the actual participation level and learning effectiveness data of the course, teacher resources can be allocated more scientifically to ensure that excellent teachers can teach those courses that are in high demand and difficult for students [4]. Big data can also help us integrate educational resources inside and outside the campus, such as online course platform and electronic book resources, to create a rich and personalized educational resource library, so as to reduce resource waste and improve the efficiency of resource use [5].

2.2 Using big data to improve the teaching process

By analyzing the data of students in the network learning system, teachers can gain insight into their absorption efficiency and proficiency of various knowledge points. By observing students' pause and replay behavior when watching teaching videos, teachers can infer which parts students find difficult to understand, and adjust the order and depth of teaching content accordingly [6]. Through in-depth mining of classroom interaction data, teachers can grasp students' activeness and performance in discussions, adjust teaching strategies in a timely manner, and make teaching activities more in line with students' learning needs, thus improving the overall effect of teaching [7].

2.3 Improve the learning evaluation system with the help of big data

Different from the single evaluation method that only relies on final grades in the past, huge data resources can bring a more macro evaluation perspective. These data cover many details of students' learning process, such as the time consuming and accuracy of online homework, the activity and quality of classroom interaction, and the frequency of use of extra-curricular learning resources [8]. Big data can also continuously monitor the learning process of students and conduct in-depth analysis of the development trend of their learning ability, which not only helps teachers optimize teaching methods, but also assists students to customize personalized learning plans, thus improving the scientific and accurate evaluation [9].

3. Innovative path of information-based teaching in colleges and universities under the background of big data

3.1 Teaching model innovation

With the rapid development of data technology, the educational means reform of higher education institutions has ushered in an unprecedented development opportunity. With the power of data, personalized teaching plans can be implemented, and through in-depth analysis of students' learning habits and knowledge level, an exclusive learning path can be tailored for each student, such as providing learning materials and exercises suitable for their abilities [10]. The hybrid teaching model combining online and offline has made great progress, and the real-time feedback of big data is used to optimize classroom teaching and the allocation of online resources [11]. VR, AR and other cutting-edge technologies are cleverly integrated into teaching practice, and big data is used to evaluate students' technological adaptability and application effect, aiming to create an immersive learning environment, stimulate students' thirst for knowledge, and cultivate their innovative spirit and practical ability [12].

3.2 Innovation of teaching management

In the field of curriculum scheduling, through in-depth mining of key data such as course popularity index and time preference of teachers and students, the intelligent configuration of curriculum schedule is realized to effectively reduce time conflicts [13]. In the teaching monitoring link, the use of big data technology to real-time track the teaching reality, collect key indicators such as classroom communication and student concentration, and conduct an all-round assessment of teaching quality to ensure that problems are detected and dealt with early. In the construction of teacher team, according to the data of teachers' teaching effectiveness and students' feedback, the path of teacher training and further study is precisely planned, and the improvement of teachers' professional skills is strengthened.

3.3 Innovation of teaching evaluation

The previous evaluation system was mainly based on summary, but in the era of big data, we can integrate formative and summative evaluation [14]. Through multi-dimensional data tracking of students in the learning process, including progress tracking, homework feedback and online time, we can monitor students' learning status and skill progress in real time [15]. The sources of evaluation have become more diverse, not just teacher evaluations, but also student self-evaluations, peer evaluations, and indicators such as teamwork and self-learning ability extracted from the data. The expression of evaluation results is also more intuitive, through data visualization means, so that teachers, students and parents can intuitively grasp the learning situation, so as to point out the way for teaching optimization.

4. Conclusion

Through in-depth exploration of the theoretical correlation between big data and informatization teaching in colleges and universities, implementation of practical strategies and innovation paths, college teaching has undergone profound changes in resource allocation, teaching process, evaluation system and other aspects. This series of changes not only improve the quality of teaching, but also help to train innovative talents to adapt to the development of The Times. In the future, we should continue to tap the potential of big data, and continuously optimize the teaching mode, management mode and evaluation mode, so that the informatization teaching in colleges and universities can develop in a more scientific, more efficient and more personalized direction with the help of big data, and inject continuous vitality into the education cause.

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