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Analysis and Application of Educational Big Data Based on Student Behavior Analysis

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Abstract

With the rapid development of education informatization, the construction of university digital campus is accelerating, and the types and sources of educational big data are increasing. The analysis of students' learning behavior based on educational big data has gradually entered the field of vision of educators and researchers. Big data will play a very obvious role in the reform of school education. Big data has obvious advantages in improving the quality of school management and teaching and improving the evaluation methods of students' education. With the continuous progress of educational information technology, using learning behavior analysis technology to collect students' learning habits, learning process, learning results and other data can provide the basis for teachers' teaching evaluation and guidance, thus achieving accurate evaluation and guidance and improving the quality of education and teaching. This paper analyzes the value of big data generated by students' campus behavior, and then analyzes students' behavior, realizing the informationization of students' management means, improving the scientific level of students' education management, and promoting the construction of intelligent digital campus.

Keywords

Big data; Informatization; Analysis of students' behavior; Teaching quality.

1. Introduction

In the Internet era of rapid technological development, various new technologies are constantly changing the lives of the general public. Big data technology has been widely used in people's study, life and work, and has developed rapidly [1]. With the continuous development of information technology, technologies such as Internet of things, cloud computing and big data have been widely used. With the continuous construction of University Digital Campus and "smart campus", the data accumulated in the campus information environment is also gradually expanding, and a relatively complete campus big data environment has been formed [2]. The traditional campus management concepts and data analysis methods can not meet the growing needs of data processing. In order to realize the efficient management and sharing of campus data, make full use of students' school behavior data to build a digital campus and smart campus, and improve the level of campus informatization, it is necessary to adopt data mining methods to optimize students' management, analyze their behavior laws according to students' behavior characteristics, and timely guide students' behavior to develop in a comprehensive and healthy direction [3]. With the continuous progress of educational information technology, the use of learning behavior analysis technology to collect students' learning habits, learning process, learning results and other data can provide a basis for teachers' teaching evaluation and teaching guidance, so as to achieve accurate evaluation and guidance and improve the quality of education and Teaching [4].

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With the continuous development of information technology and the continuous increase of various service management platforms in the campus, the accumulated data has increased in a large amount, including students' consumption law, living habits, learning and other behavior data, which has formed a relatively complete campus big data environment [5]. How to efficiently manage and share campus data, optimize student management by using big data mining and analysis ideas and methods, and provide clearer and detailed data services for students' campus life through analysis results is one of the problems faced by the construction of campus service system [6]. Due to the uneven construction time and different technical architecture of campus application systems, the problems of complex data types and low data quality are brought about, and the continuous growth of data scale poses severe challenges to data storage and analysis [7]. This paper analyzes the big data value generated by students' campus behavior, then analyzes students' behavior, realizes the informatization of students' management means, improves the scientific level of students' education management, and promotes the construction of intelligent digital campus.

2. The Role of Big Data Technology in the Analysis and Early Warning of Students' Campus Behavior

2.1. Improve the Accuracy of Analysis and Early Warning

Teachers' teaching behavior can cause, maintain and promote students' learning behavior, and teachers' teaching behavior should be based on the analysis of students' learning behavior. Learning behavior is the basic unit of learning analysis. The analysis and research of learning behavior generally takes behavior and the causes of behavior as the research object from the perspective of behavior science and behavior system. With the continuous development of information technology, the data generation of digital campus is mainly realized through two channels: teaching activities and educational management process, and a large amount of structured or unstructured educational data is generated. In the educational information society, the generation of various electronic devices and the development of learning software enable students to learn anytime and anywhere, which has broken through the limitations of traditional classrooms and books. Therefore, the content of learning behavior analysis is also relatively wide [8]. After the application of big data technology, it can effectively make up for its shortcomings by comprehensively collecting and analyzing data information related to students' campus behavior. Compared with the education data obtained by traditional methods, education big data has stronger real-time, continuity, comprehensiveness and naturalness, and uses different applications to analyze and process data with different complexity and depth. With the continuous advancement of educational informatization, it is gradually possible to identify, collect, process and analyze students' learning behavior by using technologies such as big data mining, correlation analysis and regression analysis. The comprehensive application of big data technology in the field of education means that more learning process information is captured and analyzed, which is conducive to promoting more scientific learning behavior evaluation.

2.2. Dynamic Management and Analysis of Early Warning Data

Traditional data storage and processing methods do not have high timeliness and cannot keep up with the changing speed of students' campus behavior, which just provides an opportunity and possibility for the application of big data technology. After the application of big data technology, it can dynamically track and monitor the early warning data of students' campus behavior analysis, so as to discover the anomalies in the data in time, actively implement intervention and avoid the occurrence of bad behaviors. Educational big data collects all data related to teaching activities generated by teachers and students in the whole teaching

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activities, and can automatically record all situations in learning activities [9]. Through deep mining and analysis of educational big data on students' learning behavior, teachers can clearly understand each student's learning progress, accurately analyze students' learning behavior, make comprehensive and objective evaluation on students, timely feedback the problems presented in students' learning process, and give play to the guiding function of evaluation. At the same time, teachers can summarize the gains and losses of teaching and learn lessons through the problems expressed by students' learning behaviors, so as to provide support for teachers' teaching decision-making and teaching guidance.

3. Analysis and Early Warning of Students' Campus Behavior Based on Big Data Technology

Traditional student behavior management is often experienced and path-dependent management. Nowadays, with the application of big data, we can actively grasp the characteristics and laws of students' campus behavior, and make judgments and predictions accordingly. Therefore, mining the practical value of educational data in teaching management, teaching and learning, and developing an early warning management platform for students' campus behavior analysis based on big data can process and analyze educational big data according to school teaching quality, students' daily behavior, students' safety control and psychological counseling, and assist the macro decision-making of school management. With the continuous development of information technology, students' learning is not limited to classroom teaching, but also assisted by some network platforms. Correspondingly, the data sources of students' learning behavior include not only the learning conducted through formal classes, but also online learning platform and informal learning based on network. The structure of the student management system is shown in Figure 1.

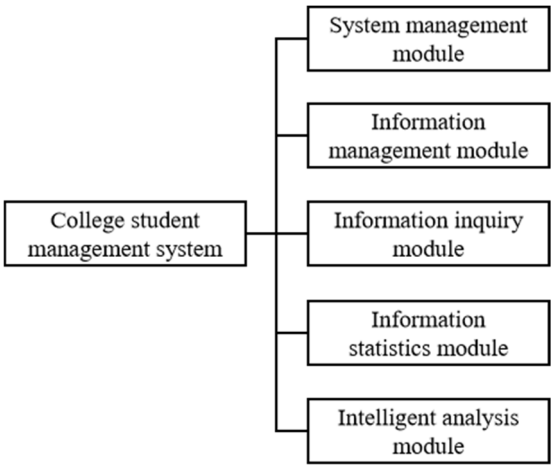

Figure 1. System structure

Because of the complexity of dynamic data collection methods and environmental factors, it is necessary for multiple data collection terminals to work in different environments, and different behaviors affect performance data in each environment. Comprehensive and accurate data are needed to support the accuracy of the algorithm. Data integration is to sort out the learning behavior data obtained by various ways, encode the data uniformly, and classify the data into students' learning methods, learning habits, learning processes and learning results according to certain standards, and then process the data. Data analysis is to use or build a certain data analysis model to analyze the learning behavior data, explore the relationship between multiple behavior data variables, and present the analysis results in a visual way [10].

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For some simple learning behavior data, we can build models according to relevant knowledge and analyze them according to established models. By monitoring the network behavior, we can analyze the hot topics of the students who use the network, and analyze the students' attention to current political sensitive issues according to the frequency of the highlighted political words. Teachers and student managers can analyze public opinion based on these data. The framework of student behavior prediction and early warning model is shown in Figure 2.

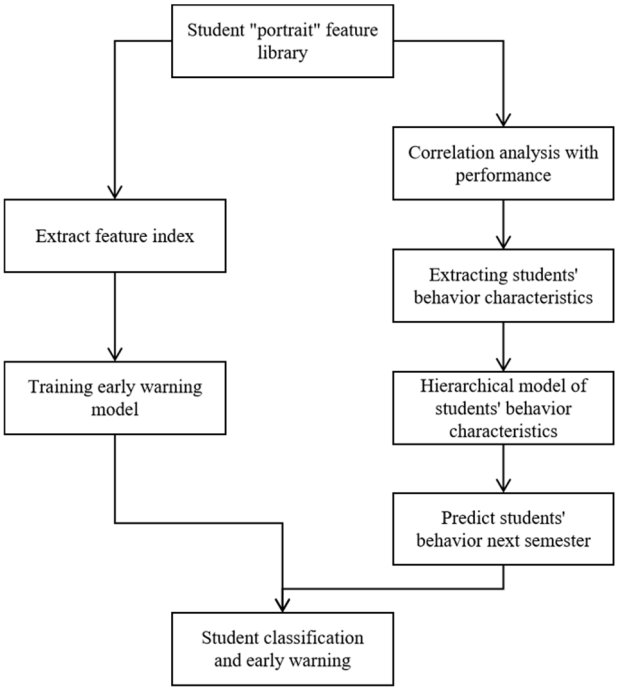

Figure 2. Student behavior prediction and early warning model

After the collection, processing and analysis of students' learning behavior data, it is the application of learning behavior data. The results of learning behavior analysis based on educational big data have great application value for educational researchers, teachers, parents and students. When building an early warning platform for analysis and management, the tool for collecting, processing and analyzing students' behavior data in the campus environment on a large scale is Hadoop, which makes big data closely related to the student management system and forms the overall framework of the platform. Based on the hierarchical model of student behavior, the grades of students are determined according to their personal information, and the samples of senior students participating in student behavior prediction are extracted accordingly. Educational big data makes the process examination possible, which can transform students' diverse learning behaviors into quantifiable data information, and provide a basis for teachers' teaching evaluation. Teachers can learn about students' learning process and learning behavior through the educational big data counted by technical means, which is convenient for horizontal and vertical evaluation of students, so as to achieve accurate evaluation and play the developmental function of evaluation.

4. Conclusions

On the basis of big data, the developed early warning system for students' campus behavior analysis can effectively monitor students' behaviors, warn students' bad behaviors in advance, and achieve the purpose of prevention in advance. This paper mainly expounds the integration and analysis of relevant data based on big data of student work, and finally forms a complete data analysis and service platform of student behavior. Educational big data makes the process

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examination possible, which can transform students' diverse learning behaviors into quantifiable data information, and provide a basis for teachers' teaching evaluation. Teachers can learn about students' learning process and learning behavior through the educational big data counted by technical means, which is convenient for horizontal and vertical evaluation of students, so as to achieve accurate evaluation and play the developmental function of evaluation. The platform system can dig deep into students' behavior and psychological problems, help school administrators to make macro decisions on teaching management, assist teaching production safety management and control, and realize a series of early warning functions such as early warning index model, early warning information generation and early warning information push, so as to truly realize intelligent digital campus.

Acknowledgments

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