

The Application of Big Data Technology in the Analysis of Higher Education Optimization Management

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Abstract: In order to understand the application of big data technology in the optimization management analysis of higher education, an application research based on big data technology in the optimization management analysis of higher education is put forward. This work is the first to explore the application of big data technology in the learning management of college students, which aims to understand and update design concepts, improve higher education, and support and support the continuous improvement of education and technology management. Everything around and in the development of higher education. Second, a 60-item questionnaire for counselors working in selected text colleges, including three issues: first, behavior management, second, access management skills, and third, management strategies. According to the test results, after data mining, the academic performance of the university's students is above 0.6, which is higher than the average. Among them, the value of character management is the greatest, so it has important applications in student work. Studying the use of big data technology in the management of higher education students is better for reforming higher education and promoting educational development. Support the growth of higher education through big data, big scope, and high-value big data-specific data properties.

Keywords:Big data technology; Optimize management; College students

1 Introduction

With the increasing demand for information in today's society, digital governance has become an important consideration for the development of ordinary people in China. Now, the development of big data in many business and social business shows the difference. At the same time, these benefits are recognized by government agencies and business management. In recent years, the development of our country has seen new changes and changes in the management of computer information in universities. At the same time, in the process of development and innovation, the application of information gradually changes into the mature development stage and development process. For the school, student management is the most important thing. Traditional learning management models are difficult to monitor due to limitations in data collection methods. The emergence of big data has made it easy to collect this information, and big data has created new areas of academic management and university work. Collecting the necessary information is now easier than ever. It is possible to provide the system without the need to register and monitor education as before. Accounting is time-consuming, labor-intensive, and error-prone. Big data and infrastructure schools have

many points of exchange. Using big data helps administrators understand and monitor schools so they can make informed decisions. At the same time, they can use big data to understand students' thoughts and guide teachers to think about students' problems[1-2]. As one of the representative tools of the information age, big data technology has brought unprecedented opportunities and challenges to higher education management. By collecting, storing, and analyzing large-scale educational data, universities can gain a more comprehensive and in-depth understanding of students' learning behavior, the utilization of educational resources, and various aspects of the educational process. These data can not only be used to track students' academic performance, but also to predict students' needs, identify potential problems in advance, improve teaching methods, and ultimately optimize the management and operation of higher education. This study aims to explore the application of big data technology in the optimization and management analysis of higher education, and to answer the following questions: How to effectively collect and process large-scale higher education data? How can these data be utilized to improve students' learning experience and academic achievement? How to optimize resource allocation to improve educational efficiency? By analyzing existing literature, case studies, and practical applications, we will attempt to provide a set of big data analysis methods and best practices applicable to higher education management, in order to provide valuable references and references for university managers, policy makers, and researchers. As shown in Figure 1:

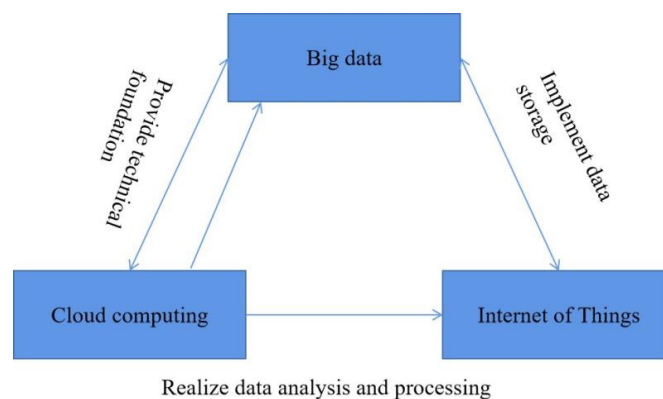


Figure 1 Big Data Technology

2 Big data in the management of college student opportunities

There are still many problems in the use of big data in the management of college students, and in order to improve the management of students, these problems should be identified and research in depth according to the facts and needs of college students. administration. on the fine-tuning of large information technology application systems and application processes, and the study of information technology applications in higher education. As shown in Table 1:

- (1) Improve awareness of big data and gain a clear understanding of big data.

Building and improving big data knowledge is the first and foremost to support the deep use of big data, which includes:

1. University materials are teaching materials. Historical data, real data and external data of universities will help to improve the education of universities through the full use of information technology, which will improve the competitiveness of science students.

2. The use of big data technology in the management of college students is a change of thinking and change, which shows the thinking of analyzing the truth, and it is not a correction of traditional educational ideas and methods.

The use of big data technology in student management is not simple data analysis, but the use of tools and big data technology to control and use the information expenditure of higher education through the knowledge of the circulation of everything. to gradually improve all aspects of management. Constantly promote innovation and change in educational theory and management of colleges and universities, improve the key challenges of colleges and universities, and better understand the work of colleges and universities[3].

(2) Improve big data production for management students in higher education.

The use of big data in student management should be based on a big data platform that contains all the details of event data. A big data platform provides students with access, storage, maintenance, analysis, and computing functions to manage big data management. Only by building a good data platform can we go deep into the use of big data, and it is not recommended to use big data if the data source is available or the platform is not complete and easy. Therefore, we must first create a large database to support software development and student management development in colleges and universities.

(3) Strengthen the large IT professional team.

Creating big data is a professional task that requires all links and systems to be connected and functional, and requires rules, commands and professional design. Therefore, in order to promote the effectiveness of big data in student management, first of all, it is necessary to ensure the reliability of technology himself, that is, create and support a team of experts with powerful tools and management. Colleges and universities strengthen the development of skills, improve data mining, collect data and knowledge of data, and use information technology. well with resources in higher education management; Based on wisdom, we will continue to promote the research and practice of big data in higher education management[4-6].

Table 1 Application Path in College Student Management

Enhance the awareness of big data	Enhance the core competitiveness of colleges and universities	Realize the educational function of colleges and universities
Big data platform construction	Deepening the application of big data	Promote student management.
Team building	Data mining	Talent-driven

3 Experimental study on cluster analysis of optimal management of college students' education

(1) Data Collection

The process of managing 60 quantitative assessment forms for counselor work can be divided into the following steps, including the selection of participants and consideration of reliability and effectiveness:

Participant selection: The personnel who choose to participate in this work should have a certain background knowledge, understand the operation of the College of Literature and the responsibilities of the counselor. Counselors may be selected by the leadership of the College of Arts, the counselor team, or other relevant department heads.

The selection of participants should take into account their experience, qualifications, level of attention to students within the Faculty of Arts, and professional knowledge related to the content of the work assessment form.

Design of a quantitative work assessment form: The assessment form should clearly define three indicators: management attitude, management ability, and management strategy. The indicators for each aspect should be specific and clear, so that participants can understand and evaluate.

Quantitative indicators (such as scores, percentages) or qualitative indicators (such as descriptive language) can be used to measure the performance of each aspect.

Data collection: Participants should evaluate the work of counselors based on the indicators in the assessment form. This can be done through various methods such as observation, recording, student feedback, and counselor self-evaluation. The data collection process should ensure anonymity and confidentiality to encourage participants to provide genuine feedback.

Data analysis and summary: The collected data needs to be analyzed, scores calculated, or qualitative feedback summarized. Statistical software can be used to process data to ensure the objectivity and accuracy of the results. The score of each counselor should be weighted based on the weight of each indicator to obtain the overall score.

Reliability and effectiveness considerations: When designing an assessment form, consideration should be given to the reliability of the indicators, that is, whether reusing the assessment form under the same conditions will result in similar results. To ensure the effectiveness of the assessment form, that is, whether it accurately reflects the work performance of the counselor. Reliability and effectiveness can be evaluated by testing the internal consistency, repeated measurement, correlation, and other methods of the assessment form.

Feedback and improvement: After analyzing the results, feedback should be provided to participants, including their strengths and suggestions for improvement.

The design and process of assessment forms should also be regularly reviewed to ensure that they reflect the changes and needs of the College of Arts, and necessary improvements should be made.

Ultimately, this process can help the College of Arts evaluate the work performance of counselors and provide targeted suggestions and guidance for improving and enhancing their management abilities. By carefully designing and executing, the reliability and effectiveness of the assessment form can be ensured, thereby better supporting students and promoting the development of the School of Arts[7-8].

(2) Transmission of data

Based on the four questions above, first calculate the rating value. So it will be about data transfer. Using different systems to change the data is important to change what is difficult to measure truthfully, and only using score levels to measure disagreeable behavior. Accordingly, the above results are divided into good, good, reasonable, bad, bad, and sorted by grid values in [0,1], and their values are considered as "1.2,0.65,0.45". ,0.2,0" respectively. Those. Average knowledge of all objective measures. For example, energy management = (Participation in classroom meetings after the assessment of students in the classroom) / 3.

(3) Mining information

Clean and organize the data and then only get the data as shown in Table 2 for example.

Table 2 Data Mining Technology

Management attitude	supervisory capability	Managing energy efficiency	management strategy
0.56	0.6	0.047	0.48
0.58	0.6	0.25	0.45
0.46	0.46	0.30	0.32
0.48	0.69	0.58	0.63
0.7	0.8	0.73	0.74

(4) Implementation of the algorithm

According to the data mining requirements, the first three of the 50 performance parameters are considered as sample data mining, and the required data points are classified into close groups, mostly by Euclidean distance. The mean vector of each group is prepared by the algorithm and recursively works as a new basis. Given a given data set $D = \{X_1, X_2, X_n \dots\}$, find k groups, usually $(C_1, C_2 \dots, C_k)$. After analysis, it can be seen that $k = 3$, so the VC programming algorithm is used: the first three groups are samples; When making changes to group C_k ; Create a group; do for $k = 1, \dots, n$; $C_k = \{X \text{ belongs to } D\} (D(R_k, x) \leq D(R_j, x))$ for each $j = 1.k, j \neq k$; end; Group new position; $k = 1, \dots, n$; For n , do; $C_k =$ the last vector point at the center of R_k .

(5) Consolidation

By analyzing 60 samples, 15 group 1 (good), 31 group 2 (average), and 4 group 3 (bad) groups were obtained (including the number of samples in each group) received. Group 1 sample data has 35 samples except 1 sample data, so $14/50 = 28$; Similarly, group 2 is $30/50 = 70$; Group 3 $3/50 = 7$. Considering only the data center, the average score for management behavior is 0.600, the average score for management ability is 0.576, the average score of

management is 0.548, and the average score is for management performance. 0.575 a. Those. After data mining, the student's GPA at this university is higher than 0.6, which is higher than the average ranking. Among them, the value of behavior management is the highest, so it is important for students to work. Management has the lowest score, so it is necessary to adjust the management process, improve communication with students, and learn the positive opinions of students[9-10].

4 Conclusion

At a time when information technology and the business community are developing rapidly, the role and responsibility of big data in the business community is not limited to the work level only. For the church, it is a new way of thinking and growing. In the era of big data, the management of college students' education has begun to face new opportunities and challenges. Changes in university education and changes in the characteristics and activities of university students in the new era show the necessity of using big data in management of school education. Big data is a management change that can improve the level of academic management in universities. The vision for improving school management in a big data environment is clear. In short, in the new era, there must be information and materials necessary for the development of students' skills, and different materials must be used to obtain useful information for the continuous improvement of student performance.

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