Research on Innovation and Development of University Education Management from the Perspective of Big Data

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Abstract. In the context of the growing development of big data technology, university education management is facing unprecedented opportunities and challenges. The thesis aims to study the innovation and development of college educational management from the perspective of big data and propose corresponding innovation and development strategies. This paper first summarizes the development status of big data, and then deeply analyzes the influence of big data on university education, including improving management efficiency, optimizing resource allocation, and promoting personalized education. Then, the paper puts forward innovative strategies of university education management, including building data-driven decision-making mechanism, boosting informative education. Finally, through the case analysis, the practical application effect of big data is verified.

Keywords: Big data, University education management, Innovation and development, Data-driven, Educational informatization.

1 Introduction

1.1 Research Background and Significance

With the rapid development of information technology, big data has become an important resource in today's society and has a great influence on the various branches. The field of education, as an important position for cultivating talents and promoting social progress, has been profoundly influenced by big data technology. As an essential part of higher education system, the innovative development of higher education management is very important for boosting education quality and training innovative talents. Therefore, it is great value to study the innovation and development of university education management from the perspective of big data.

1.2 The Domestic and Abroad Research Status

Presently, the domestic and abroad scholars have conducted extensive research on the big data application in the field of education. Abroad scholars have recognized the potential of big data in the area of education earlier and put forward a series of education management models and strategies on the basis of big data. Scholars at home have also

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gradually focused on big data application in higher education management in recent years, and have achieved certain research results. However, there are still some shortcomings in the existing researches, such as few case studies on the specific application of big data in university education management, and insufficient discussion on innovative development strategies. Therefore, this paper aims to provide reference for promoting the standard of university education management and boosting the development of higher education through in-depth research on the innovative higher education management from the perspective of big data.

1.3 Research Content and Method

The research of the thesis mainly includes the development status of big data technology and its application in higher education, the analysis of the impact of big data on college education management and the discussion of the innovative development strategy of college education management on the basis of big data. In the light of methods of research, the thesis will adopt various ways, for instance, literature review ways and case analysis ways, combined with relevant domestic and foreign research results and the reality, to conduct in-depth study on the innovation and development of higher educational management from the perspective of big data.

2 Overview of Big Data Technology and its Application in Education

2.1 The Essential Concepts and Features of Big Data Technology

Big data technology refers to the collection, storage, processing, analysis and mining of massive data. [1] Its features primarily include large amount of data, data structure diversity, low data value density, fast data processing, reliability of data. These characteristics enable big data technology to deal with complex problems that traditional data processing methods cannot cope with, providing new impetus for all walks of life. In the field of education, big data technology can offer more precise and comprehensive information support for educators through the data on students' learning behaviors, educational resources, education management and other aspects, helping to optimize the distribution of educational resources and enhance the educational quality.

2.2 Application of Big Data in the Area of Education

At present, the application of big data in the area of education has molded into a definite shape. In the light of teaching, big data can assist teachers get a better understanding of students' learning and offer a basis to personalized teaching. In the light of management, big data can help universities optimize resource allocation and improve management efficiency. In the light of relevant research, big data can provide rich data for research and educational science. However, although big data application in the area of education has achieved certain results, there are still some challenges and shortcomings, for

instance, data quality issues and privacy protection issues. Therefore, we need to further study big data technology application in the area of education and overcome the shortcomings.

2.3 The Development Trend of Big Data in Education

With the continuous progress of data technology and the continuous expansion of application scenarios, big data application in the field of education show the following development trends: First, data-driven personalized education will become the mainstream, and students' learning behaviors and interest characteristics will be studied to provide customized studying paths and resources for each student; [2] Second, education management will be more intelligent and refined, optimize management processes and improve decision-making efficiency; Third, the protection of privacy and security of educational big data will receive more attention, and it is vital to build a reliable data protection pattern and technical means.

3 Analysis of the Influence of Big Data on University Education Management

3.1 Promote the Efficacy of Higher Education Management

The application of big data technology can significantly promote the efficacy of university education management. [3] By gathering and analyzing various education management data, such as student information, curriculum arrangement, teaching resources, etc., schools can more accurately grasp the reality of education management, and find and solve problems in time. Meanwhile, big data technology can assist schools achieve automated and intelligent management, reduce manual intervention and errors, and promote management efficacy and accuracy.

3.2 Optimize the Configuration of Educational Resources

The application of big data technology is helpful to optimize the configuration of college education resources. Through intensive analysis of students' learning needs, interest characteristics, teachers' teaching ability, research direction and other data, schools can more rationally arrange courses and allocate teaching resources to assure the full utilization and effective manipulation of educational resources. Besides, big data technology can assist schools find potential resources, such as excellent teachers, high-quality courses, etc., to offer strong assist to the long-range growth of schools.

3.3 Promote the Development of Individualized Education

The application of big data technology is vital in promoting the growth of personalized education. Through intensive gathering and analysis of the data of students' studying behaviors, grades, hobbies and other aspects, the school can provide personalized

learning programs and resource recommendations for each student to meet the various requirements and characteristics of students. This can enhance studying interest and enthusiasm of students and promote the teaching effect.

4 Innovative Development Strategy of Higher Education Management on the Basis of Big Data

4.1 Build a Data-Driven Decision Mechanism

To leverage strengths of big data technology, universities need to build data-driven decision-making mechanisms. This means that colleges and universities should enhance the gathering, sorting and analysis of various educational data to carry on a scientific and systematic data decision-making process. Through data analysis, universities can more precisely appreciate the status quo and problems of education management, and offer strong backing to decision-making. Meanwhile, universities should build trans-department and cross-field data sharing mechanism, break data islands, and make full use of data resources. [4]

4.2 Promote Information Technology Application in Education

Education informatization is an important application field of big data technology in college educational management. Colleges can increase the input in informatization structure and improve the informatization level. Specifically, colleges can strengthen the structure of campus networks, promote online education platforms. [5] Meanwhile, colleges should also make use of big data technology in order to study students' learning behaviors and needs, and provide more personalized and accurate services for online education. In addition, universities can also improve management efficiency through information technology means, such as the use of intelligent office systems, data visualization technology and other ways to optimize management processes.

Enhance Data Safety and Privacy Protection.

In the era of data-driven decision-making, the problem of data safety and privacy conservation has become increasingly prominent. Universities should pay attention to data safety and privacy conservation when making use of big data technology for educational management. Colleges must build a sound data security management system and technological safeguard procedures to assure the security and integrity of educational data. Meanwhile, colleges also need to strengthen the conservation of personal intimate information, comply with relevant legislation and regulations and ethical norms, and prevent data leakage and abuse.

5 Case Study

5.1 Case Selection and Sources of Data

To prove the practical application effect of big data in the innovation and development of higher educational management, this paper chooses a university as the case study object. Nowadays the university has actively boosted the informatization of educational management and the implement of big data, and accomplish remarkable consequences. The data of this study mainly come from the university's education management database, online education platform and student information management system.

5.2 Case Study Process and Results

By means of deeply mining and studying the university's education management data, big data technology is vital in improving management efficiency, optimizing resource allocation and promoting personalized education. For example, the school makes use of big data technology to study students' learning behaviors and provides personal studying programs and resource recommendations for different students. Meanwhile, the curriculum and instructing arrangement were optimized through data analysis, and the teaching quality and student satisfaction were improved. In addition, the school also uses big data technology to rationally allocate and effectively utilize resources of education, promoting the usage efficiency of resources of education.

5.3 Case Revelation and Experience Summary

Through the analysis of this case, we can draw the following enlightenment and experience: First, universities should strengthen the promotion of big data technology, and make full use of its advantages in educational management; Secondly, colleges should establish a sound data collection, processing and study mechanism to offer strong assist to decision-making. Finally, universities also need to focus on data safety and privacy conservation to ensure compliance and sustainability of big data technology.

6 Conclusion and Prospect

6.1 Research Conclusions

Through the study on the development and innovation of higher educational management from the perspective of big data, the thesis deeply analyzes the impact of big data technology on higher educational management and the development and innovation strategy. It is found that big data can significantly promote the efficiency and quality of higher educational management, optimize the allocation of educational resources, and stimulate the advancement of personalized education. Meanwhile, the thesis also brings forward innovative development strategies such as building data-driven decision-making mechanism, promoting education informatization process and

strengthening data safety and privacy conservation. Through case analysis, the practical application effect in the innovation and development of higher educational management is verified.

6.2 Research Deficiency and Prospect

Although this study has made some achievements, there are still some shortcomings. For example, the specific application ways and scenarios of big data technology still need to be further studied; At the same time, this study mainly takes a university as an example for case analysis, and the research scope can be expanded in the future to carry out comparative studies on different types and levels of universities. Looking into the future, with the continuous improvement of big data technology, its application in higher educational management will be more extensive and in-depth. Prospective study can further pay attention to the innovative application and practical experience summary of big data technology, so as to provide more powerful support for the development of higher educational management.

7 Conclusion

From the perspective of big data, this study deeply discusses the strategies and paths of development and innovation of higher educational management. Through theoretical analysis and case studies, we recognize the vital potential of big data technology in improving the efficiency of educational management, optimizing resource allocation and enhancing personalized education. Meanwhile, we are also aware of the need to pay attention to data safety and privacy conservation in the course of enhancing big data applications. Looking into the future, with the continuous improvement of big data technology, the application in higher educational management can be more extensive and in-depth. We hope that more colleges can positively seek and practice the innovative model of big data education management, and contribute wisdom and strength to promote the educational quality and management level. Meanwhile, we also hope that relevant departments can enhance the development and research and promotion of big data technology, and offer strong assist to the innovation of university educational management.

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