

Optimization Approaches for Higher Education Management in the Era of Big Data

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Abstract: With the rapid development of the world economy, big data has emerged, representing the world's innovative development and widely recognized by society and the public. Especially in the era of computer and internet, information data is an important component of cultural production and economic growth, and it is applied in daily production in the form of new production factors. Education management is crucial in the development of universities. In the context of big data, the problems of education management in universities are becoming increasingly apparent, and there is an urgent need to optimize and reform education management. In the era of big data, the education management of college students is at an unprecedented height. How to apply big data technology to the education management of college students has become an urgent task for current universities. Based on this, this article analyzes the optimization approaches for university education management in the era of big data from the following aspects.

1. Introduction

In practical life, people delve deeper into statistical data, which is conducive to effectively promoting social production reform, and human historical development has entered an emergency plan. The development of big data technology has a direct impact on the flow of funds related to technological development, and on the other hand, it has brought certain interference to the management of higher education. The quality of education has significantly improved, and the value and role of educational values have become more prominent. Essentially, educational management is an essential part of modern higher education. The application of big data technology improves the efficiency of daily management work, enriches management content, and provides an important driving force for deepening reforms in universities.

2. The Importance of Higher Education Management in the Era of Big Data

Big data refers to a collection of large-scale and complex types of data, which specifically includes related technologies such as data collection, storage, cleaning, and mining. The data collection mainly includes data collection through sensors, and collection and management of mobile devices and various network data information based on web crawlers. With the progress of the times and the continuous improvement of modern technology, a large number of sensors have emerged in the market, creating favorable conditions for data collection. Due to the obvious

advantages of big data technology itself, relevant departments should fully apply big data technology and make use of its advantages, deeply explore the application strategies of big data technology, fully understand and take effective application measures to solve the problems that arise in technology application, and on this basis, fully leverage the value of big data technology to provide important impetus for social and economic development. Therefore, in the era of big data, the management of higher education is of great significance.

2.1 There has been significant innovation in the education methods of universities

Firstly, big data technology has brought about changes in the management system of higher education. In the management of higher education, it is common for traditional work models to have rigid systems, low efficiency, and inability to flexibly respond to unexpected work situations. The application of big data technology is beneficial for universities to comprehensively collect, process, and analyze student information, effectively carry out educational management work based on the actual situation of students, and lay a solid foundation to innovate the education management system of universities. Secondly, clarify the subject status of students in learning. In traditional university education management, the status of students is relatively passive, and most of them are responsible for education management by class teachers, counselors, student organizations, and class cadres, which cannot fully reflect the status of students themselves. The effective application of big data technology in university management has once again clarified the student-centered education concept, encouraged students to actively participate in educational management work, enhanced self-management awareness, and improved their cognitive abilities, thereby effectively improving the efficiency of university education management work.

2.2 Promote universities to accelerate the construction of smart campuses

In the era of information, digitalization, and knowledge-based explosion, the development of young people is relatively confused under the influence of the information frenzy. In this situation, based on the management of higher education, universities effectively serve student teaching management. The development of big data technology is conducive to building real-time interactive relationships between university management personnel and students, deepening the development of personalized education, and accelerating the construction of smart campuses. On the one hand, universities should apply big data technology to reasonably integrate data on student learning and life, coordinate resources from various departments, and deeply integrate different educational management carriers to enhance interactive efficiency. This kind of interaction is not limited by time and space, achieving leapfrog development from online and offline, on campus and off campus, and virtual reality, continuously expanding the scope and coverage of education management, and gradually forming an integrated university education system. On the other hand, by applying big data technology, university administrators can systematically analyze relevant educational management information, accurately grasp the actual needs of students, leverage big data technology and fully leverage its advantages, comprehensively analyze the reasons for individual learning differences, and develop educational management plans based on the actual learning dynamics of students, ensuring that educational management work is consistent with student learning needs.

3. The Current Situation of Higher Education Management under the Background of Big Data

With the rapid development of the world economy, big data has emerged, representing the

world's innovative development and widely recognized by society and the public. Especially in the era of computer and internet, information data is an important component of cultural production and economic growth, and it is applied in daily production in the form of new production factors. In practical life, people delve deeper into statistical data, which is conducive to effectively promoting social production reform, and human historical development has entered an emergency plan. The development of big data technology has a direct impact on the flow of funds related to technological development, and on the other hand, it has brought certain interference to the management of higher education. The quality of education has significantly improved, and the value and role of educational values have become more prominent. Essentially, educational management is an essential part of modern higher education. The application of big data technology improves the efficiency of daily management work, enriches management content, and provides an important driving force for deepening reforms in universities.

3.1 Weak awareness of big data technology application

At present, big data technology in university teaching management is in its early stages, and teachers and students lack the concept of applying this technology, nor fully recognize the significance of technological application. When applying this technology, the lack of a unified data model, comprehensive technical equipment, and information data security issues have led to a lack of clear application targets. Some universities lack standardized data management, and the flow of all factor data seriously affects the application of this technology, resulting in poor flow effects. The primary task facing university education management is how to effectively apply big data technology.

3.2 Lack of a sound management mechanism

The smooth implementation of education management in universities requires the improvement of management mechanisms, which is an important guarantee and a crucial link in the application of big data technology. However, in practical work, universities have not yet formed a sound education management mechanism, and the established indicator system is too simple or management decision-making is subjective. In this situation, it is urgent to improve the management mechanism in the management of higher education, optimize the collection, statistics, and analysis of relevant data, in order to improve the efficiency of management work.

3.3 Slow informationization construction of educational management work

Firstly, in the management of higher education, there is a large space for the construction of information resources. For example, in the construction and management of university libraries, on the basis of effectively maintaining and managing traditional reading resources, we will accelerate the construction of digital book resources. Only by synchronously promoting this work can we create a good educational environment for college students. For example, applying information technology to manage student information, grades, teachers, teaching quality evaluation, resource construction, and student sources. Secondly, there is a shortage of talent in information management, and the level of education management informatization is relatively low. Although some universities have invested a large amount of funds to purchase modern information equipment, due to a lack of professional management talents, information equipment is useless.

3.4 Serious differentiation of information data within universities

In the management of higher education, the functions of various departments vary, and different departments have different channels to obtain information with different contents. In this situation, the data resources of universities are relatively scattered and the phenomenon of "information silos" is more serious. Due to the different standards of information data within the school, the limitations of collaborative management work are evident. In addition, Ge universities have their unique characteristics and different types of databases, but the lack of unified standards for university data and the serious phenomenon of repetitive construction greatly increase the difficulty of mathematical information analysis and integration work^[1]

4. Approaches to Optimizing Education Management in Universities in the Big Data Environment

4.1 Enhancing awareness of the application of big data technology

In the era of big data, university teaching should also follow the trend of the times and enhance the awareness of "big data" application. Effectively applying big data technology to practical teaching management and making it a teaching focus, comprehensively integrating university informatization and network technology in combination with the actual situation of the university, and improving the ability of universities to collect, organize, analyze, and apply big data. Therefore, university leaders should fully understand the significance of the application of big data technology and increase publicity efforts, such as holding regular meetings to highlight the importance of this technology for teaching management work; Or regularly visiting lectures to strengthen big data thinking and fully leverage its impact on teaching work. The entire process of education management deeply applies big data technology, fully leverages its influence, and ensures better service to higher education management.

4.2 Establish a sound education management system

Universities need to build a big data service platform mechanism based on big data technology, it is necessary for universities to effectively promote education management work and establish service mechanisms, adhering to the principles of norms and standards to provide accurate, complete, and secure data. At the same time, open platforms effectively absorb various social resources, promoting the win-win development of schools, students, and society.

Universities need to establish a family school social collaboration mechanism. In the big data environment, universities actively carry out educational management work, and schools, families, and society work together to comprehensively integrate resource sharing information. Therefore, universities should establish a reasonable mechanism for family school social cooperation, deeply explore educational resources and expand the scope of educational networks, in order to add vitality to educational management work.

4.3 Accelerating Information Construction and Effectively Cultivating Information Management Talents

Universities need to invest heavily in promoting the construction of digital information technology. In the management of higher education, there should be sufficient funds to ensure the digital library, smart classrooms, multimedia equipment, teaching computers, information management systems, and dedicated network resources, and to increase investment in the rapid

construction of information infrastructure. Improving the level of infrastructure informatization construction can effectively innovate education and teaching. The development of big data technology has enriched the teaching content of schools, and traditional teaching resources clearly do not meet the diverse learning needs of students. Therefore, universities should fully apply big data technology to explore rich teaching resources, ensure effective promotion of educational management work, and promote students' comprehensive development.

Universities should also strengthen the cultivation of information technology talents and enhance the comprehensive literacy of education management personnel. In the management of higher education, management personnel are important executors, and therefore their comprehensive qualities directly affect the actual work results. In the management of higher education, employees should have high comprehensive literacy. Firstly, universities should organize professional knowledge and skill training to improve their educational management level and information literacy. In this process, reasonable evaluation methods and standards are set to effectively screen outstanding education management personnel and improve management efficiency. Secondly, universities should regularly organize educational management personnel to visit and learn, establish communication and learning platforms, or use information platforms to organize training classes, teacher salons, or lecture competitions, laying the foundation for improving the comprehensive literacy of management personnel. Finally, establish a special fund for talent cultivation, increase investment, attract excellent teachers, hire high paying experts and scholars, and help improve the work ability of management personnel. In addition, it is necessary to create more opportunities to ensure that teachers participate in communication and learning. In the context of big data, universities can establish "talent exchange" channels to ensure that education management personnel have the opportunity to learn more new knowledge and skills, and to enhance their comprehensive literacy by leveraging their strengths and avoiding their weaknesses.

4.4 Systematic decision-making and planning

In the era of big data, university education management faces great opportunities, which requires university education management personnel to fully apply big data technology for systematic planning. Firstly, universities should establish a planning and decision-making mechanism to build a comprehensive platform. In the management of higher education, multiple groups and rich levels of interaction should be utilized to strengthen the optimization of governance structure, and the decision-making process and process should actively include graduate students, undergraduate students, managers, academic staff, teachers, and administrative supervisors^[2]. Based on the concept of sustainable and collaborative development, universities should accelerate the improvement and rational planning of governance structures, effectively build platforms for coordinating and planning various resources, ensure a positive distribution network and interest nodes, and promote departments and organizations to effectively use information technology to carry out various work. Based on a common decision-making system, the education management department comprehensively integrates information data to deeply explore its functions and improve the efficiency of resource application. Secondly, university education management personnel should clarify their target positioning and establish a scientific framework system. Education management personnel can fully reflect the standards and formatting characteristics of data from different aspects. Simply put, in the management of higher education, relevant personnel should clearly construct a development framework and path, establish standard forms of data resources, and arrange data maintenance, use, and collection in an orderly manner to ensure full sharing and development of application data materials. In the construction of standard structures, universities should dynamically collect and integrate various types of data, and use standardized

education resource agreements to ensure that university education management data is consistent with big data application standards.

5. Conclusion

In summary, big data technology is widely used in various fields of society, and university education management work should also actively innovate in line with the trend of the times. Universities should have a deep understanding of the characteristics of big data technology, clarify the current situation of education management work, establish big data thinking, effectively build information sharing platforms, innovate teaching models, accelerate the cultivation of information management talents, build intelligent campuses, further optimize student management models, address specific problems, ensure that efficient education management work has richer content and forms, and lay a solid foundation for improving the level of education management.

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