

# The Dilemmas and Practical Exploration of Undergraduate Education Management in Universities in the Era of Big Data

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**Abstract:** In the context of rapid information development, massive data provides important support for society's technological development and innovation. The management of undergraduate education in universities involves various industries, and the traditional education management model is no longer suitable for the needs of management departments and educational institutions. Therefore, universities should combine the characteristics of education management majors and continuously promote the high-quality development of education management in the context of big data. However, from the current situation, there are still many shortcomings in managing undergraduate education in universities. In this regard, this article will start with the current difficulties in undergraduate education management, analyze and explore the practical path of undergraduate education management in universities in the era of big data to provide effective suggestions for developing universities.

**Keywords:** The era of big data; Education management; Information technology

**Online publication:** August 27, 2024

## 1. Introduction

The rise of big data has brought tremendous changes and opportunities to various industries. In education, the application of big data has put forward new requirements and ideas for higher education management<sup>[1]</sup>. In order to better adapt to the reform of higher education, undergraduate education management should also actively change its thinking and cultivate comprehensive talents that meet social needs. In the context of big data, universities have a deep understanding of students' learning and development needs, and through personalized customization of teaching management systems, dynamically adjust education and teaching plans to meet the diverse demands of students<sup>[2]</sup>. At the same time, universities should carry out educational management work purposefully and systematically based on students' learning attitudes and actual needs, promoting the sustainable development of educational management.

## **2. Opportunities and challenges for undergraduate education management in universities in the era of big data**

### **2.1. Opportunities for undergraduate education management in universities**

With the rapid development of information technology, big data has penetrated into various industries, bringing unprecedented opportunities for higher education management <sup>[3]</sup>. Big data not only provides abundant information resources for universities but also makes it possible to innovate their management models. Below, the study will analyze the opportunities that the big data era brings to university education management from three aspects: (1) providing an information exchange platform, (2) constructing a scientific data model, and (3) promoting students to formulate refined learning goals and plans.

#### **2.1.1. Provide an information exchange platform to optimize campus management**

In the era of big data, universities can leverage advanced technological means to build diverse student information exchange platforms, such as online forums, social platforms, etc. These platforms not only meet the information exchange needs of students with the outside world but also enable universities to timely understand students' ideological dynamics and behavioral habits to eliminate internal risks within a specific time and avoid some incidents from the source <sup>[4]</sup>. At the same time, universities can provide more convenient and efficient services for students and further optimize campus management by building a sound education management model, such as implementing the One Card system.

#### **2.1.2. Building a scientific data model to improve decision-making efficiency**

In the era of big data, universities can use information technology to build big data models and conduct in-depth mining and analysis of massive data. These models can help internal management departments in universities to have a clearer understanding of the school's operational status and explore potential challenges and areas that need improvement <sup>[5]</sup>. Based on these data analysis results, relevant management departments can formulate more scientific and reasonable decision-making plans, improve decision-making efficiency and effectively prevent risk issues in education management.

#### **2.1.3. Promote students to develop refined learning goal planning**

For students, applying big data analysis models is also of great significance. By collecting and analyzing student learning data, students can better understand their learning goals and develop scientific learning plans. Meanwhile, students can also use big data to predict potential risk issues and take effective measures in advance to prevent them <sup>[6]</sup>. This not only helps to improve the learning efficiency and quality of students but also promotes their comprehensive development.

### **2.2. Challenges to undergraduate education management in universities**

In the era of big data, university student education management is facing a series of unprecedented challenges. With the rapid development of information technology, massive amounts of information are generated and disseminated astonishingly. For college students, this environment not only provides them with abundant learning resources and communication opportunities but may also bring a series of negative impacts, such as information overload, misleading content, etc., which poses greater challenges to managing undergraduate education in universities <sup>[7]</sup>. In addition, in practical situations, many educational management personnel in universities have relatively weak abilities in information technology, which increases the complexity and difficulty of management. Therefore, universities should strengthen the training and cultivation of management personnel and enhance their information technology literacy and data processing capabilities to better respond

to the challenges of the information age.

### **3. The current dilemma of undergraduate education management in universities**

#### **3.1. Management work is relatively lagging behind**

In actual university education management, due to the difficulty and complexity of student management, some education managers have experienced lagging work and inadequate management, which greatly affects students' learning experience and effectiveness. Firstly, the arrival of the big data era has led to significant changes in universities' education and teaching models. The advancement of technology has driven the digital transformation of education management. Still, it also requires education management workers to be keenly aware of social changes and adjust and optimize education management work promptly <sup>[8]</sup>.

Due to deficiencies in the informatization construction of educational management in some universities, such as incomplete educational resource database systems and insufficient degree of informatization co-construction and sharing of educational resources, educational management work cannot keep up with the pace of the times and cannot meet the needs of students. In addition, students in the era of big data have higher requirements for educational management work. They hope to learn more conveniently and efficiently and expect schools to provide more personalized and accurate educational services. However, due to the lag of some universities in the construction of educational management information, the needs of students cannot be met, resulting in an unsuitable situation.

#### **3.2. Insufficient efforts in cultivating educational management talents**

The era of big data has improved efficiency and quality in higher education management. However, it has also raised the requirements for training education management personnel. There are shortcomings in the training of educational management talents in universities, which, to some extent, restricts the further development of educational management informatization <sup>[9]</sup>.

Firstly, the complexity of big data information has increased the difficulty of processing higher education management work. Faced with massive amounts of data and information, educational management personnel lack professional processing and analysis abilities, leading to difficulties in management work and may result in incorrect decisions and adverse consequences. Secondly, the channels for universities to obtain information and data are gradually diversifying, which requires university administrators to process information scientifically. However, due to the inconsistent standards of deep management work on various online platforms, there are both positive and incorrect aspects in the massive amount of data and information, leading to deviations in many universities' management work. For college students who are in a critical stage of psychological development, it will seriously affect their physical and mental health.

#### **3.3. The awareness of educational management in universities is shallow**

In recent years, there has been a lack of awareness among the education sector in the construction of educational management informatization in the era of big data, which has led to an increase in risks and a decline in management quality in educational information management work. In the era of big data, the informatization construction of education management plays a crucial role in improving education quality, optimizing resource allocation, and promoting education modernization <sup>[10]</sup>. However, due to the shallow awareness of education management in universities, problems such as unclear data management systems, scarce technical equipment, and information data security risks have emerged in specific management practices, resulting in the insufficient application of big data technology in university education management.

## **4. The practical path of undergraduate education management in universities**

### **4.1. Develop precise management plans to promote high-quality development**

In the era of informatization, universities should transform traditional educational concepts and develop precise educational management plans to better respond to diverse students and constantly changing educational environments and promote high-quality education development. Developing precise education management plans requires taking the actual needs of students as the core, starting from various aspects such as teaching management, learning management and life management, and establishing a scientific, precise and personalized education management system. In addition, as the main battlefield for talent cultivation, universities should take the lead in achieving high-quality development and delivering more talent to society <sup>[11]</sup>. Carrying out reforms in higher education management supported by big data can effectively promote the high-quality development of universities.

Firstly, develop a management plan. Due to the difficulty and complexity of undergraduate education management in universities, many managers are prone to various problems. As educational administrators in universities, it is necessary to have a clear understanding of how to scientifically plan, guide and coordinate the lives and studies of college students. Developing a management plan has become the first issue that needs to be addressed in the management of undergraduate education in universities. The development of management plans in universities must be student-centered and student-centered, based on the service concept of serving students and meeting their basic needs. Through information technology exploration and collection of various resources, scientific and effective education management plans must be formulated, making universities' education management plans and methods more precise and targeted <sup>[12]</sup>.

Secondly, strengthen information technology. With the development of new-generation information technologies such as big data and artificial intelligence, various industries in China are actively promoting information construction. In education, undergraduate education management in universities should also adapt to the development of the times and strengthen information technology in student management work <sup>[13]</sup>. The application of information technology in education management can comprehensively improve the quality and efficiency of higher education management, ensuring that big data technology can provide assistance and services for higher education management.

Thirdly, enhance the quality of students. The teaching objectives of universities no longer only emphasize students' theoretical knowledge but are dedicated to cultivating their innovative thinking, practical skills, and sense of social responsibility. Therefore, the new education management model should emphasize the comprehensive development of students and encourage them to participate in extracurricular practice, volunteer service and other activities based on their actual needs. In addition, undergraduate education management departments need to introduce more assessment systems in education evaluation, such as student participation, teamwork ability, and interdisciplinary knowledge. Through comprehensive quality education, students can better cope with future career challenges and grow into talents with more comprehensive qualities.

### **4.2. Accelerate the construction of smart campuses and achieve comprehensive integration of resources**

A smart campus is achieved through modern information technology to digitize various resources within the campus, including the teaching environment, teaching resources, campus management and campus services. The construction of smart university campuses is conducive to helping educational management achieve comprehensive integration of resources. Information technology is very important in constructing smart campuses and providing important technical support. Therefore, universities can use smart campuses to promote the comprehensive integration of campus resources, and undergraduate education management departments

can also effectively integrate various resources with student education management, providing convenience for students' learning and life. With the support of smart campuses, undergraduate education management in universities can break through various limitations, achieve effective integration of reality and virtuality, on campus and off campus, online and offline in student management, expand the scope and coverage of education management, and establish a new integrated pattern of education management <sup>[14]</sup>.

In response to the "student attendance management system," undergraduate education management departments in universities can use smart campuses to set up electronic attendance systems. The traditional attendance method requires teachers to call names individually, which wastes time and is prone to errors. Introducing a smart campus system, students can complete attendance by swiping or clocking in, greatly reducing teachers' workload and facilitating the unified management of student attendance by management departments.

### **4.3. Building a university management platform and optimizing management models**

The campus management platform provides network and information collaboration for universities through functions such as information sharing and educational guidance, helping universities strengthen their educational management work. The university education management platform supported by big data mainly covers the following five functions:

- (1) The collection and integration of management resources, such as student information, course arrangements, and teaching activities;
- (2) Educational information, which includes functions such as analyzing learning situations, teaching plans, and publishing educational policies <sup>[15]</sup>;
- (3) Security management, such as data backup, user permission control, and other functions;
- (4) The intelligent campus card function, which uses information technology to help students better adapt to campus life, etc.;
- (5) Efficient collaboration, which can achieve information sharing and collaboration among management teams, and improve management efficiency.

With the assistance of management platforms, undergraduate education management departments in universities can effectively integrate resources and ultimately achieve management goals. For example, regarding "course management," teachers can use the management platform to better understand students' previous academic and daily performance. Then, by analyzing the results, establish a clear and scientific organizational structure. At the same time, students' performance can also be rated, organized, and documented. It helps to comprehensively analyze students' learning and living conditions, laying a foundation for future management work. Building a management platform helps undergraduate education administrators in universities to develop and improve course management systems, and to do a good job in analysis and statistics.

### **4.4. Build a high-level management team and cultivate awareness of big data**

The smooth implementation of educational management work is directly linked to the comprehensive literacy of educational management personnel. Due to the integration of information technology and education, China has put forward higher requirements for the comprehensive literacy of university education management personnel. The work involved in educational management is relatively complex and requires strong information literacy to cope with various challenges in educational management. However, some universities still have a significant gap in the reserve of education management personnel. With this dilemma, universities must actively introduce composite talents with big data awareness and high-level education management experience and form

a high-level management team. With the advent of the information age, undergraduate education management personnel in universities should cultivate awareness of big data, actively integrate big data technology into undergraduate education management, and further improve various data in student education management based on the actual teaching situation in universities. Undergraduate management staff in universities can better understand big data technology through training meetings, information management lectures, exchange meetings and other means, thereby strengthening their awareness of big data technology in their daily work. For example, undergraduate management departments in universities can carry out “exchange lecture activities,” introduce external management talents to give lectures and allow management personnel to participate in lectures. Through training and exchange, they can help internal management personnel strengthen their awareness of big data, continuously improve their ability to collect, analyze, and organize data, and provide guarantees for the development of undergraduate education management in universities.

## 5. Conclusion

In summary, facing the impact of the big data era, undergraduate education management in universities has also ushered in new opportunities and challenges. Although many universities vigorously promote the integration of information technology and undergraduate education management, due to a lack of experience and resources, the undergraduate education management departments in universities are still in the exploratory stage. In response to this issue, universities should actively explore the practical path of education management work using big data technology. A high-quality education management system should be established by formulating education management plans, optimizing education management models, strengthening big data awareness, and other methods. While continuously improving work efficiency, it should help students achieve comprehensive development and support the development of education in universities.

## Disclosure statement

The author declares no conflict of interest.

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