# The Application Analysis of Big Data Technology in the Educational Management of College Students

## Dongmei Wang

Chaoyang Teachers College, Chaoyang, Liaoning Province, China

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**Abstract:** In the era of big data, information technology has gained attention in all walks of life, which has impacted people's production, life and work, and also promoted the innovation and development of today's education. Under such circumstances, the educational work of colleges and universities will face more new challenges and opportunities. In the new era, the education management of college students needs to progress and innovate with the changes of the times, improve the previous education model, and achieve the unique development of education management. Based on the practical application of science and technology of big data, this paper analyzes the current application of big data technology in the education and management of college students, so as to find out the development path of college students' education and management under big data, which is a great way for the education of college students in the modern era development and reform provide the basis.

## 1. Introduction

With the advent of the era of big data, many aspects of our social life have undergone tremendous changes. A variety of new media and new platforms have continuously infiltrated into all aspects of our work and life, which has greatly improved our work efficiency and quality of life. At the same time, big data and informatization also have their own characteristics. Failure to understand and grasp their characteristics will cause us some problems. College students are knowledge-intensive and active groups, and their acceptance of online information technology is more flexible and faster. WeChat, Weibo, QQ, forums, and post bars have become an important tool for college students to acquire knowledge and social life. Big data In the era of college student education management, there will be a series of challenges. How to deal with these challenges is a question that college teachers should think about [1].

## 2. The Overview of Big Data Technology

Big data refers to data sets that have a very large amount of data and a very complex data type. Such data cannot be stored and managed with traditional databases. The main characteristics of big data are large data volume, complex data categories, fast data processing, and high data authenticity. The forms of data include structured data, semi-structured data, and unstructured data, such as videos, pictures, text, and web browsing records [1]. Big data technology mainly includes 5 aspects: visual analysis, data mining, predictive analysis, semantic engine and data quality management. Through data mining, find the influencing factors that affect a certain result, and build a corresponding data model. Through machine learning algorithms, continuously use the existing data to train model parameters, making the model prediction more accurate. Big data has several characteristics [2]:

Veracity: The information obtained by big data is continuous data, which is true and reliable, and the data analysis process is more accurate, which greatly improves the effectiveness and credibility of data processing.

Velocity: Fast speed is the most prominent feature of big data. In data processing, a new technical framework is applied to solve the limitations of traditional data processing models.

Variety: The traditional data types are mainly structured data. The storage is in the form of row data. Big data incorporates images, videos, text, audio, etc. into the processing object to achieve unstructured, semi-structured and structured integration of data processing.

Volume: Every industry produces a large amount of data in its daily work. In 2012, the total global data totaled 2.7ZB. It is expected that this data will soar to 40ZB in 2020.

Value: With the help of big data, it is possible to mine the implicit relationship between the data, so as to find the important information more accurately and quickly.

## 3. The Advantages of Big Data Technology in the Education Management of College Students

### 3.1 Control Gradually Changes to Prevention after Engaging in

Although in the long-term development process, most universities in China have formed a relatively complete emergency mechanism for education management in terms of student education management models in order to respond flexibly, deal with and intervene in crisis when emergencies occur. However, in reality, emergencies and crisis events are not fixed and have a certain randomness. For the emergencies and crisis events in the education of college students, the first-hand resources grasped by the school are learned through the submission of reports by students and regular inspection by counselors. The method of predictive assessment has a certain result lag, which leads to crisis events. The situation is already serious. In addition, schools sometimes fail to manage in this regard. Under the big data environment, both schools and teachers and students can rely on wearable devices, mobile smart terminal devices, Internet behavior records, social activity behavior records and other technical means to record their own thoughts and behaviors [2]. These will be in the form of big data information.

### 3.2 From Individual Politics to Overall Coordination

First of all, the advent of the era of big data has provided more efficient and efficient education management technology and concepts for the management of college students in China. These decentralized to integrated education management systems are having a profound impact on the new generation of college students in China. A new generation of young people think and restrict their behavior. At the same time, in the era of big data, it not only has a positive impact on the personal qualities of college students, but also can improve the ideological state of education managers of college students. Secondly, the education management of some colleges and universities in our country is "requested and appealed by leaders, but grass-roots education staff are in the form" [3]. Although some colleges, universities, and other party committees 'administrative and educational affairs departments have participated in it, the various school-work offices, youth league committees, and other organizations have also cooperated as required to maintain the normal operation of college students' education and management.

### 3.3 From Static to Dynamic Adjustment

As far as the current situation is concerned, most colleges and universities in our country are mainly based on the static work mode when carrying out student education management. All work processes are organized step by step, everything is based on rules and regulations, and procedures are strictly followed. Under this working mode, the school's student education management work has not made timely adjustments to the education management method according to the actual educational environment and the dynamic changes and needs of students [3]. There are certain loopholes in the flexibility of the management model. Most of the student behavior management, learning management, life management and other information materials involved in the process of student education management are student registration forms and other content that are filled in after the students enter the university. The school did not have any information on these materials and specific behavior data of students in the later period. The analysis and integration only played the role of recording student information, and did not generate more useful management value, which caused some functions of useful student information not to fully play [4]. However, in fact, an effective

student education management system and method should be flexible in response to specific circumstances and targets. Big data provides realistic possibilities for the reform of college students' education management work, so that colleges and universities can realize a dynamic management model in their own management process.

## 3.4 From One-Way Indoctrination to Mutual Interaction

Some scholars have proposed that any system in the world is constantly changing from disorder to order. The key is not the balance of development, but the synergy between the various subsystems involved. Under this effect, it will form Corresponding self-organizing structure. At present, most of China's colleges and universities show a trend of "internalization" in the management of students. That is to say, after decades of development, the model of student education management has basically formed and has the characteristics of modelization. Shows self-replication, stagnation, and difficulty in changing with the development of the times. This "internalized" management mode mainly reflects the characteristics of unidirectionalization, pressure and stability in the process of college student education management. Because universities attach great importance to the stability of student management, the pressure on student education managers is increasing day by day, and there is no certain standard as a reference, and there is no bottom in the specific implementation of the management work center [4].

## 4. The Problems of Big Data Technology in the Education and Management of College Students

Big data technology has brought many positive influences to the daily life of college students, but for the time being, there are still many problems in the application of big data technology in the management of college students that need to be continuously improved.

## 4.1 The Data Application Mechanism is Not Sufficiently Developed

At present, big data technology involves all aspects of people's daily life, and has been applied and developed to varying degrees in various fields. People have also resonated with the social values they created. However, traditional educational thoughts and traditional education models make universities pay insufficient attention to big data technology, and their true practical value is not reflected, eventually leading to weaker awareness of big data in college students. Therefore, the application management of big data in colleges and universities is prone to problems such as less investment, weak mastery of technology, and lack of strategic guidance [5]. This also largely prevents the rapid development of college education management.

## 4.2 Insufficient Efforts in Data Standardization

The education and management of students in colleges and universities is a very complicated process. In this process, the cooperation of the teaching affairs system, student information system, and student employment information system in the school is required to better manage students. It is precisely due to the cooperation of multiple parties in the process that the degree of dependence of universities in management is too high, which directly causes data to be more restricted in consistency and uniformity [5]. Insufficient and accurate student management data has also hindered the acceptance of effective links between data. As a result, the work efficiency of university management is greatly reduced.

## 4.3 Data Islanding is Common

Data islands are mainly caused by the fact that the channels for obtaining data from various departments managed by universities are too independent. In view of this phenomenon, because the data islands are scattered, they cannot fully play the active role of big data in student management. Therefore, colleges and universities should establish relevant mechanisms to combine these data islands to form a whole, so that the original islands are scattered [6]. The integration of the data has

brought back its original positive role, and it has also made it impossible for universities to carry out their management work effectively.

## 4.4 The Structure of Student Management Data is Complex, and the Application Technology of Big Data is Difficult

From the perspective of specific big data, the sources of information data for middle school students in colleges and universities are relatively wide, and the value is high. Student data can be specifically divided into structured data, semi-structured data, and unstructured data. The so-called structured data is mainly used to represent certain information with the specified unified number and symbol types. Generally, it refers to the student data [6]. The student number and name used, etc.. Corresponding to this, the meaning of unstructured data refers to relevant information that cannot be represented by numbers and special symbols, such as video and audio; semi-structured data are all elements of school construction.

## 5. Application of Big Data in University Student Information Management

Big data provides new elements for the development of student management work, and also puts forward new requirements for student information management work. In order to give play to the role of big data in student information management work, it is necessary to reform ideas and methods.

## 5.1 Innovative Ideas

Thought is the precursor of action. In the information management activities of college students, we must establish the concept of big data management, build an "Internet + education" management model according to the requirements of student management, and exert the value, diversity and scale of big data. Construct a comprehensive big data information management platform, scientifically collect and process student information, and change from the traditional manual management mode to intelligent direction, thereby further improving the energy efficiency of student management [7]. For colleges and universities, it is necessary to build a data sharing system based on the number of students and professional settings, and form a joint force between various departments.

## 5.2 Optimize the Top-Level Design of the System

The perfect information management system is composed of hardware and software (campus network). Although universities have spent a lot of energy on the construction of hardware equipment, some hardware systems still cannot meet the application requirements of the big data era. To this end, it is necessary to update the hardware equipment with the times, improve the network reception capacity, ensure that the campus network can carry the massive information in the era of big data, and provide other value-added services while meeting the needs of teachers and students, so as to achieve information resource development and hardware investment [8].

## 5.3 Create University Engineering System

The content of student management work is complex and involves all kinds of information of students during the school period. This type of information is complex and diverse in structure, and is distributed in multiple departments. Colleges and universities need to build a unified metadata platform and develop a standardized data management system [7]. Data can be seamlessly integrated, strengthen the top-level design, and promote information exchange and sharing. An information sharing platform is built on the basis of cloud computing, providing a secure network environment and efficient server resources for student management, and creating a unified management pattern of resource sharing, information sharing, and maintenance [9].

## 5.4 Optimize Life Management Decisions

In the information management of college students, life management is a key content. An excellent university student should be able to "learn to survive", "learn to do things", and "learn to live". In traditional life management activities, paper submission is often adopted. This static management

mode is difficult to feedback the problems existing in students' lives from various aspects. The application of big data can effectively make up for the above shortcomings. At present, in order to facilitate the life and management of students, colleges and universities have comprehensively implemented the campus card [7]. The campus card records the student's life track. Combining big data and card data can provide accurate decision-making for students' life management. In the specific process, including "information collection", "data integration", "data processing", "result application" [9].

## 6. Summary

An integral part of the internal management of student management at universities, in order to improve the quality of management, leaving information management strategy, establish a sense of big data, combining it with the student information management, building big data management system, to enable students to information management working towards a healthy and scientific development track.

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