Research on Student Management in Higher Physical Education Institutions in Big Data Era

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Abstract. Big data, as a new technology, has attracted more and more attention from various industries. Also, big data is constantly penetrating into the field of education, injecting new impetus into the development of education. Currently, the impact of big data on education has also attracted wide attention for all countries. In the context of big data, it is necessary to face the impact of the new educational field. For higher physical education institutions, the advent of big data era is both an opportunity and a challenge. With regard to educational methods, role positioning, etc., higher physical education institutions need to make a series of transformations. Based on the author's learning and practical experience, this work first analyzed the concept and thinking of big data, and then discussed the characteristics of big data era for students' education management in colleges and universities, and finally put forward the strategies for coping with college students' management from the perspective of big data.

Keywords: Big data; Physical education institutions; Student management; Innovation.

1. Introduction

The continuous development of the Internet and related industries has further expanded the impact on students. The data types and quantity generated by various data terminals used by students have increased significantly, which offers the data base for the application of big data technology in colleges students' management and service [1-2]. Based on the deep mining and scientific analysis for massive data, big data seeks the implicit relationship and value behind the data, so that people can shift from speculation based on small sample data or preference selection based on perception to decision-making based on data analysis and rational evidence. In big data era, data analysis and data mining, as an information technology, is mainly driven by the growth of data accumulation and the demand for data analysis. Through the analysis of massive data, valuable insights can be obtained.

2. The Concept and Thinking of Big Data

Big data is defined as a new generation of architecture and technology designed to get more economic and effective value from data of large capacity, high efficiency, different types and structures. It is used to describe and define the massive data generated in the information explosion era, and name the related technological development and innovation. However, Viktor Mayer-Schönberger believes that big data is something that people can do based on large-scale data, and these things can't be done based on small-scale data. Either way, there are two relevant pieces of information to be gleaned from this: massive data, and what can be done with it (new technology). Big data is a change in thinking [3]. First of all, it no longer seek to research with as few representative samples as possible in the statistical sense, but to research with things related to or even secondary related to the things being studied. More importantly, the research object has changed from a limited sample to a whole. Secondly, it no longer pursue the accuracy of data in the attitude towards data, but value the quantity and complexity of data. Finally, it pay more attention to the relationship between things rather than to explore its causal relationship in the research concept.

3. The Characteristics of the Era for Students' Education Management in Colleges and Universities

3.1 The Change of Era Requires Colleges and Universities to Change Their Management Concepts

The biggest benefit brought by big data is the great increase of information availability, which offers more space for college students to obtain learning and entertainment resources, communication channels, self psychological satisfaction, etc. This will inevitably require college student workers to change from traditional "hard" education management to "flexible" management, and from unified management education to service guidance. To adapt to this change, college students' education and management workers are required to establish a comprehensive data awareness, and fully explore the laws and related factors contained in big data through Internet technology and campus information technology. It is necessary to discover the potential laws and major problems in the "sleeping" data in time. These rules are used to guide and serve students subtly, to prevent and guide the problems found in advance, and to ensure the healthy growth of students and successful success.

3.2 Popularization of Big Data Methodology Leads to Management Innovation

Based on the understanding of the "potential value" contained in the massive data, big data application started from Google's successful flu prediction practice in 2009. Big data has been fully applied in all aspects of business change and medical, technological, astronomical, historical, etc. In a sense, it is obvious that big data has become the methodology for people to understand and change the world in the information society. This methodology pushes the traditional causality theory to the relevance theory [4]. By mining and analyzing the relevance effect in the development process of things, these relevance laws are used to guide the management practice, thus avoiding the traditional law verification process with too long cycle and effectively improving the timeliness of management work. In the management of college students' education, making full use of big data technology, mining the information contained in various application systems and students' social data of digital campus can offer decision-making basis for students' education management services. This will inevitably make the management more humanized and accurate.

3.3 Data Fragmentation Increases the Difficulty of Information Utilization

Big data is characterized by large amount of data, many types and sparse value, but fast generation and failure. With the rise of IT technologies such as cloud computing, social media, mobile Internet, Internet of things, etc., college students generate a lot of fragmented data in their daily study, life and society. These data are scattered in various application systems and social media, which are difficult to be integrated and have low value for independent use. However, they contain a large amount of valuable regular information after full integration, mining and analysis, which is urgently needed for students' education and management in colleges and universities. Discovering these regular information inevitably requires the college student education management department to improve the "data capacity", and to be able to process large amounts of data in a high speed, responsible and sustainable way. so as to obtain campus public opinion more effectively and accurately, analyze students' interest points, and carry out accurate and effective student education management and service work. In this way, campus public opinions can be obtained more effectively and accurately, and students' interest point can be analyzed. Thus, students' education management and service work are carried out accurately and effectively.

4. Coping Strategies for Student Management in Higher Physical Education Institutions in Big Data Era

4.1 Big Data Analysis Platform Combined with Internet of Things, Internet + and Other Technologies

As a large-scale integrated system, education involves many departments and many different personnel, including teaching, scientific research, management and other departments, students, teachers and administrative personnel. Due to the large number of departments and complex personnel, there are certain differences in data acquisition in different regions and schools, which will cause the complexity of data sources and data collection difficulties. Students in physical education colleges and universities spend a large part of the year competing and training outside. Students management workers can obtain data resources through their mobile phones, MicroBlog, WeChat, QQ, etc., thus analyzing big data, mastering their hobbies and characteristics, and implementing human management and services. Big data analysis involves people and things. People include students, teachers, parents and managers, and things include information system, server, mobile phone app and data acquisition module [5]. Big data is composed of these platform modules that offer data collection, which can finally generate data clusters such as individual education big data, curriculum education big data, school education big data, etc., as shown in Fig. 1.
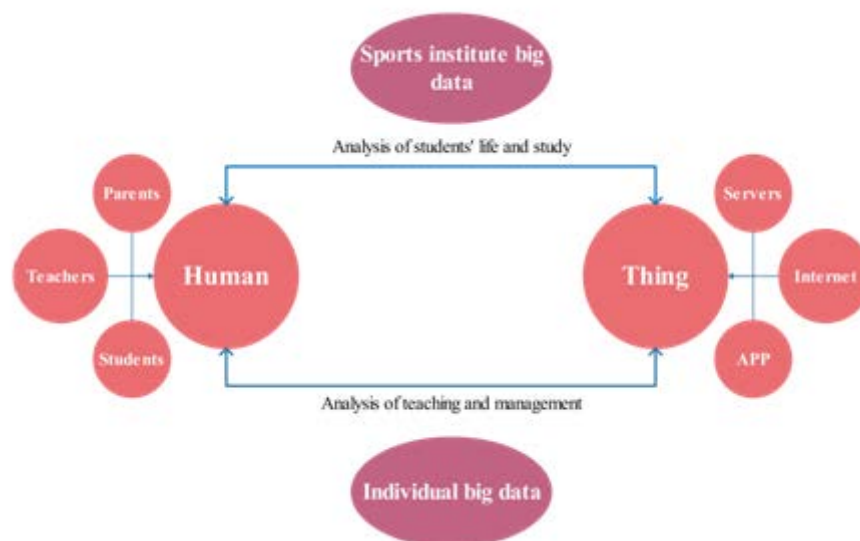

Fig. 1. Component module of big data analysis platform

4.2 Integrating Resources and Constructing Big Data System in Colleges and Universities

Each department has its own information management system. These systems bring a lot of convenience to management, but also bring the disadvantages such as weak cooperation among various departments and insufficient resource sharing, etc. Big data technology can fully integrate the scattered data of social institutions, school departments, departments, classes, etc. By building a shared data platform, it can effectively connect various systems and realize information integration. This kind of analysis for big data can overcome the decentralization of thinking and realize the systematization of educational management decision [6-7]. At present, the existing technical means in colleges and universities can only analyze a small amount of information data, and the analysis technology of big data has not been used. However, there is no doubt about the value of the development and utilization of big data. Colleges and universities need to invest human and financial resources to build big data platform, integrate and analyze various information resources to meet students' learning and personalized development needs.

4.3 Building Big Data Analysis Team and Improving the Information Literacy for Student Management Personnel in Colleges and Universities

In the tide of big data development, all kinds of personnel in colleges and universities are facing the challenge of improving information literacy. Colleges and universities should realize that information technology support is the foundation of school development in big data era. Schools can build an information-based education environment and an information-based service team in combination with their own positioning [8]. First of all, an information construction team with big data analysis ability should be established. With the development of the Internet, every student will produce varies data every day. When the data reaches a certain level, they can carry out meaningful data mining. This high-quality technical team must master the technology of scientific storage and management on the big data platform, master the methods and tools of data analysis, and build a student management system based on data analysis. Secondly, it is necessary to train and develop a student management staff who can skillfully use the education law and big data technology. Such personnel need to have strong information literacy and keen insight into data, be able to set up the concept of insight, actively collect and analyze the relevance of data information, and effectively use these related information in student work.

5. Conclusion

The popularization of information technology and the wide application of new media not only promote the rapid development of higher education information, but also bring a variety of structured or fragmented data in all aspects of students' learning, communication and life. The generation of massive data has brought students' education management in colleges and universities into big data era. "Big data", as a new ability to recognize the world in the information society, offers a new method and technical system for people to understand the world and transform the world. This work analyzed the challenges and opportunities brought by big data era to students' education and management in physical education colleges and universities, which is of great significance for the students' workers to grasp the regularity and enhance the pioneering. At the same time, the application of "big data" to student management in physical education colleges and universities will be conducive to changing service concept, improving the management and service mode, and promoting more accurate and effective student education management services.

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