

Education information management system based on Cloud Computing Technology

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Abstract. To overcome the shortcomings in the stage of education and teaching management in college and effectively transform the education mode, in this paper, cloud computing as well as big data technology are combined with college education and teaching management to promote the education and teaching management informationization. Therefore, on the basis of learning useful experience in the past, this paper realizes the effective docking of cloud computing, big data technology and university education and teaching management informatization from multiple dimensions, and then clarifies the requirements for the informatization of college education and teaching management. Moreover, these problems existing in the informatization link are explored in the context of the actual situation. Thereby, on this basis, the steady progress of informatization work can be promoted from the level of attention and technical equipment upgrading.

Keywords: cloud computing; promotion of information technology; Administration

1. Introduction

The deepening process of the economic development mode and scientific and technological innovation in China has proposed new requirements for the teaching mode of colleges. However, as restricted by traditional educational thinking as well as teaching methods, the educational and teaching activities in institutions of higher education can not really satisfy the basic needs of the use of human resources in terms of classroom organization form and talent training effect. The appearance of cloud computing as well as big data technology sped up the informatization process of Chinese higher education. Thanks to the advanced information technologies, the management mechanism of higher education is further optimized, and the teaching methods, teaching resources advancement, teachers' training, as well as informationization of student management are improved. Moreover, it promotes the management efficiency of institutions of higher education, enhances their healthy and sustainable development, and strengthens the development advantages and comprehensive strength of Chinese institutions of higher education. Taking cloud computing and big data technology as the main framework, in this paper, the informatization of university education and teaching is comprehensively promoted, and a new direction is provided for the transformation of Chinese institutions of higher education.

2. Analysis on education management information management system

Cloud computing is a model for adding, consuming, and delivering Internet-based related services, typically involving virtualized resources on the Internet. Big data aims to collect data that conventional software tools cannot be used to capture, manage and process within a specified time frame. Moreover, big data refers to a massive, diverse, as well as rapidly growing information asset that needs to enhance decision-making by using new processing models. Cloud computing technology as well as big data can effectively respond to the actual requirements for teaching and education in institutions of higher education. When seeing from a practical perspective, the data information produced by institutions of higher education in carrying out various educational and teaching activities and student management activities presents the characteristics of fragmentation. Such fragmented data information has low-value density. If information processing has no reasonable and efficient means, the college education and teaching management informatization will be greatly hindered, increasing

the information management cost, which will bring extremely negative impact on college education and teaching management informatization.

China's college education and teaching shoulder dual responsibilities, including scientific research as well as teaching, making the information processing in institutions of higher education show obvious continuity characteristics. Institutions of higher education need to conduct continuous data statistics and analysis on data information in order to guarantee the steady progress in the education and teaching management informatization. When seeing from the perspective of short-term information storage as well as long-term data analysis, the paper injects new power into the educational and teaching management activities of institutions of higher education and realizes educational informatization.

The process of Chinese education and teaching management presents more obvious multidimensional characteristics. Various student groups in higher education lead to a certain variability in the state of school operation and management. The diversity of higher education students leads to the difference in school management. For example, with the help of statistics on the frequency of book borrowings by students, it can clarify students' reading interests. By analyzing the use of student cards, it can provide timely feedback on students' family economic status. These data reflect students' learning and living status from different aspects, and provide fast and efficient processing of multi-dimensional information on education and teaching management. Based on this, school teachers and administrators can keep abreast of student dynamics and provide a necessary reference for subsequent student management work.

3. Function of information technology in the management of higher education

This paper sorts out the requirements and existing problems of teaching management informatization in institutions of higher education, clarifies the major requirements of management informatization, optimizes the main informatization process of teaching and education management, provides directional guidance for the practical application of cloud computing as well as big data technologies, and improves the informatization scientificity and effectiveness of teaching and education management.

Obviously, the informatization process of teaching and education management in universities doesn't only apply computer technology, multimedia technology, cloud computing technology, as well as big data technology, but it is constrained by collecting, storing, and analyzing education and teaching information data. The Outline of National Medium and Long-term Education Reform and Development Plan (2010~2020) ("the Outline") clearly puts forward that by 2020, a modernized education system will be built up to push forward the informatization process of teaching and education management in universities and strive to build China into power in human resources. The Outline also makes more concrete requirements for management informatization. The informatization of teaching and education management in universities should pay attention to the objective needs of college development, and take the collection, collation, analysis, storage, transmission and use of college information data as the key point, thus forming the information sharing and interaction within the college. In this way, it can reasonably allocate education and teaching resources, stimulate students' potential and promote their healthy development, combine the informatization of teaching and education management in universities with current economic development as well as talent training needs, and then enhance the healthy and sustainable development of institutions of higher education.

Nowadays, universities have gradually configured multimedia teaching systems and management systems, and these systems include two major categories. One is that universities can buy educational systems from software development companies based on their own educational and teaching needs. Such types of education and teaching systems can greatly meet the objective requirements of teaching, research, student management, and teacher training work in universities. However, these systems are not sufficiently personalized in function and not strongly targeted, which can hardly

satisfy the actual requirements of university teaching and education management. Meanwhile, in the other systems, universities utilize their available technical capabilities and tools to design their own system operation mechanism based on their usage requirements, so that the actual usage requirements can be met by the relevant software system. However, such a software development method requires high technical means, personnel quality and development investment. There are certain loopholes in the software framework, and the practicality is greatly reduced. At the same time, subject to the traditional thinking of operation and management methods, the management operation system based on the informatization is still imperfect. The emergence of these situations has greatly hindered the informatization process, thus causing a great negative influence on universities' healthy development.

4. Apply cloud computing in information-based educational management

To completely show the strengths of cloud computing and big data technologies in the management informatization process and realize the reasonable deployment of college education resources, and based on the characteristics, requirements as well as main problems existing in the computerized teaching and education management in institutions of higher education, a comprehensive technical application scheme is formulated to vigorously apply cloud computing technology as well as big data technology in the computerized education and teaching management in institutions of higher education.

University leaders play a leading part in the process of university education and teaching management informatization, because they can reduce the difficulties in the education and teaching informatization, effectively handle with the problems in the current stage of management informatization, thus fully meeting the basic requirements of the management informatization. To this end, school leaders need to start from the reality, change the thinking of work, attach importance to the role of the informatization, and gradually set up a perfect information responsibility system. Therefore, under the framework of information-based responsibility system, an effective data and information interaction model should be established in various departments of the university to achieve an optimal allocation of human resources, thus creating a good external environment to realize the information-based education and teaching work of cloud computing as well as big data technologies.

When introducing cloud computing as well as big data technologies, institutions of higher education should constantly update and optimize the information equipment from the perspective of hardware and software. During this process, institutions of higher education should attach importance to the actual demands, clarify the specific problems, adopt targeted countermeasures, and carry out the technological upgrading. When applying cloud computing as well as big data technologies, institutions of higher education should increase security system construction, appropriately enhance financial investment, and establish an effective response mechanism. In this process, technical personnel should focus on their actual status, in order to comprehensively assess the security risks faced by the informatization. Therefore, a complete security system should be established for college education and teaching management to achieve virus detection and defense, strengthen security authentication, and facilitate the application of cloud computing as well as big data technologies in the informatization process.

To guarantee the application principle, the network environment should be further improved and the use efficiency should be enhanced to ensure sufficient and effective use. On the basis of strengthening management, bottlenecks in network resource application should be eliminated and effective sources of educational resource information should be expanded. Network management and monitoring software should be configured to further improve the network operating environment and efficiently enhance the education and teaching management informatization. Meanwhile, it is indispensable to strengthen technical training, enhance the network management mechanism, and improve the supervision and control of abnormal network traffic, viruses and hacker attacks.

5. Conclusion

To comprehensively enhance the effectiveness of personnel training in and student management in Chinese institutions of higher education, and make institutions of higher education play a positive part in teaching and education of institutions of higher education while continuously optimizing the management structure, they should take the existing technical means as the support, regard advanced technologies such as cloud computing and big data technologies as the main grasp to promote the informationization progress by virtue of systematic and efficient technical means, and realize and optimize teaching methods, teaching means and classroom organization forms. After summarizing the characteristics of the college education and teaching management informatization, this paper sorts out the problems existing in the informatization process, draws on previous beneficial experience, and rapidly integrates cloud computing as well as big data technology with the informatization.

References

- [1] Zhao Ziyun, Zuo Mingzhang, Deng Guo Construction of education information public service platform based on cloud computing [J] Modern educational technology, 2012, 22 (12): 4
- [2] Yuan Lei, Cheng Mei, Liu Dan, et al Current situation and development trend of cloud computing education application in China [J] Modern distance education research, 2011 (6): 5
- [3] Wang Yang, Yan Yuanting Design and implementation of cloud computing education service platform based on P2P technology [J] Computer education, 2010 (16): 4
- [4] Chen Liang Case sharing of educational application architecture design based on cloud computing [J] China Distance Education monthly, 2015
- [5] Zhang Zhihong Research and implementation of cloud computing platform management system [J] Telecommunication engineering technology and standardization, 2012, 25 (4): 5
- [6] Wang Kun, Zhao Qun, Fan Shi, et al Exploration of educational cloud computing security management system solution [J] Automation technology and application, 2016 (3): 4
- [7] Cai Yong Design and implementation of cloud computing operation management system [D] Suzhou University
- [8] Cai Yong Design and implementation of cloud computing operation management system [D] Suzhou University, 2015