Research on Sharing Mechanism of Regional Practical Teaching Resources in Cloud Environment

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Abstract: Studying the sharing mechanism of practical teaching resources in the cloud environment is conducive to the application and innovation of cloud computing technology as well as the richness of research fields of higher education. This study attempts to analyze the significance and current situation of the sharing mechanism of practical teaching resources in universities, industry, enterprises and scientific research institutes in the region, and put forward the problems that need to be solved in the process of sharing, which is of great practical significance to improve the efficiency of the instruments and equipment in colleges and universities.

1. Introduction

At present, the differences in objectives, communication and cooperation, resource allocation and sharing platform of the sharing subjects of regional practice teaching resources seriously affect their enthusiasm for sharing. With the development of cloud computing technology, it is critical to study the sharing mechanism of practical teaching resources in colleges and universities in the cloud environment, which is conducive to the application and innovation of cloud computing technology, the richness of research fields of higher education and the improvement of the efficiency of the instruments and equipment, and is of great practical significance to bring the radiation function of universities into full play.

2. Significance of research on the sharing mechanism of regional practical teaching resources

It is an undeniable fact that there is a shortage of regional practical teaching resources. How to use the limited resources to produce the highest efficiency is an urgent matter. To study the sharing mechanism of regional practical teaching resources is the needs of the development of the integration of industry and education in local colleges and universities, the needs of enriching practical teaching resources, and the needs of enriching the research field of higher education.

2.1 The needs of the development of the integration of industry and education in local colleges and universities

The Ministry of Education and Ministry of Finance in the application opinion of “higher school undergraduate teaching quality and teaching reform project” during the “twelfth five-year” clearly put forward that it’s essential to support the cooperation of colleges and universities, scientific research institutes, industry, enterprise and relative society departments, forming a group of off-campus practical education bases for college students to share. The Outline of National Medium and Long Term Education Reform and Development Plan (2010-2020) also puts forward that it is necessary to attach importance to the development and application of high-quality educational resources, vigorously build a platform for co-construction and sharing of resources that can be jointly developed, and establish an interactive public service platform for open educational resources, and finally realize the improvement of education quality. The Circular of the Ministry of Education and the Ministry of Finance, on the Issuance of the Trial Criteria for the Awards Evaluation of the Construction Projects for Vocational Education Training Bases Supported by the Central Government Finance, points out: it is critical to reward and support the construction of a number of vocational education training bases that can share resources and integrate teaching,

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training, vocational skills identification and technical services. The orientation of these documents is very explicit, that is, to build practical teaching resources that meet the requirements of modern enterprise development and regional economy, open to the society and share.

Cloud computing provides dynamic, scalable, and virtualized resources over the Internet based on the growth, use, and delivery model of relative services of the Internet. Since Google CEO Eric Schmidt introduced the concept of "Cloud Computing" at the Search Engine Conference (SES San Jose 2006) in 2006 for the first time, Cloud Computing technology has been driving different industries to change the original models, widely used in the medical, manufacturing, financial, energy, government affairs, scientific research and education, and other fields. One of the objectives of the Ten-Year Development Plan of Education Informatization (2010-2020) is to initially build a national cloud service platform for education, and to build a public service platform for sharing high-quality educational resources with cloud computing as the technical means, gradually building a service system for sharing educational resources covering the whole country. Therefore, it is imperative to use cloud computing as the technical means to realize the sharing of practical teaching resources.

Nowadays, some universities have built a large number of cloud experimental teaching platforms by using new ideas and methods, with the help of their own built campus network and the advantages of cloud computing in convenience, efficiency and low cost. However, how to solve the problems of serious dispersion of practical teaching resources and lack of sharing and application among schools, enterprises, universities and colleges in the region is also an important topic.

2.2 The needs of enriching practical teaching resources in local colleges and universities

It is of great practical significance to study and explore the sharing mechanism of practical teaching resources in the cloud environment for improving the efficiency of the use of instruments and equipment and giving full play to the radiation role of colleges and universities.

With the continuous expansion of enrollment and the sharp increase of students in Colleges and universities, the original practical teaching resources can't meet the teaching demands of experiments, training and practice, and it is essential to invest a lot of construction funds. However, the practical teaching resources purchased and constructed by colleges and universities are limited to the use of students in schools or even some departments, resulting in the idleness of practical teaching instruments and equipment. In addition, the lack of funds for running schools is also one of the key factors restricting the development of universities, especially local newly-established undergraduate colleges. Therefore, it is urgent to explore an effective way of sharing practical teaching resources among universities, enterprises and universities in the region through the study of the sharing mechanism of regional practical teaching resources in the cloud environment, which can not only save the cost of running a university, but also improve the efficiency of using instruments and equipment.

Social service is one of the functions of colleges and universities. The construction of regional shared practical teaching resources can not only support practical teaching such as professional experiments, practical training, and practice, but also give full play to the advantages of practical teaching instruments and equipment in colleges and universities, serving small and medium-sized enterprises and universities in the region. With the help of cloud computing technology to realize the sharing of regional practical teaching resources, universities can be set up as technical service centers of small and medium-sized enterprises in the region and training service centers of communities, giving full play to the functions of colleges and universities in serving the society, and maximizing the radiation role of colleges and universities in the region.

2.3 The needs of enriching the research fields of higher education

The research and exploration of the sharing mechanism of practical teaching resources in cloud environment is not only conducive to the application and innovation of cloud computing technology, but also conducive to enriching the research fields of higher education.

With the rapid development of IT technology and Internet, cloud computing technology, which is more in line with people's higher needs, will be the new trend of information technology

development. Science and technology often promote education reform, and the development of cloud computing technology inevitably promotes the application and innovation of information technology in the field of education. Thus researches on the sharing mechanism of practical teaching resources based on cloud environment are conducive to the application and innovation of cloud computing technology.

The cooperative sharing of practical teaching resources in colleges and universities is the inevitable outcome of the development of higher education and social economy to a certain stage. The cooperative sharing of practical teaching resources among colleges and universities, between schools and enterprises and between colleges and departments in colleges and universities in the region is bound to become increasingly close. Combining cloud computing technology with higher education, from the perspective of practical teaching resources, to study cooperation and sharing among universities, enterprises and departments in the region will further enrich the research fields of higher education.

3. Research status of the sharing mechanism of regional practical teaching resources

By consulting the relevant research results at home and abroad, it can be found that there are abundant theoretical researches on cloud computing education application and resources sharing, while the content of research and exploration of regional practice teaching resources sharing based on cloud computing technology is relatively small.

3.1 Research status of cloud computing application in education

At present, the research on Educational Application of Cloud Computing mainly focuses on three aspects: the changes of learning mode, the construction of teaching resources and the informationization of education.

First, changes of learning mode. Zhou Li and others put forward a collaborative learning design scheme based on cloud computing. They believe that blog forum and QQ service platform have their own advantages, which can make them form large cloud learning community and micro cloud learning community. Huang Chengyun, Gao Hongqing and Sun Jianhua discussed the influence of cloud computing on mobile learning from the theoretical level in “Design of Mobile Learning System Based on Cloud Computing” and put forward the advantages of developing mobile learning based on cloud computing [1]. Based on the above research results, Gao Hongqing constructed a mobile learning model based on Hadoop, with which students can feedback information such as the problems encountered in learning and the need for learning resources to administrators and teachers. In addition, teachers can put forward suggestions and requirements for students’ learning situation, urge students to learn, and meanwhile administrators can constantly improve the system according to users’ comments.

Second, construction of teaching resources. Zhang Jiagui and others put forward the general plan of building digital teaching resources based on cloud computing according to the trend of information development, trying to create a teaching resources cloud that can be co-constructed and shared by colleges, enterprises and society to meet the needs of teachers, students, employees and social learners for autonomous learning.

Third, informationization of education. Sun Baixiang explained the role of cloud computing in the construction of educational informationization in four aspects: providing a new construction model of informationization hardware environment, providing a new development model of informationization software resources, providing a new implementation model of informationization network teaching and providing a new model of informationization personal knowledge management.

3.2 Research status of resources sharing

Currently, the research on resources sharing mainly focuses on the theory, mode and scope of resource sharing.

Firstly, research of resources sharing theory. There are researches on resources allocation

subjects, resources integration effect and resources sharing incentive. Xia Liping put forward in “Reflections on the Subject System of Higher Education Resource Allocation in China” that colleges and universities are the direct executors of internal resource allocation, while social subjects, as an important part, provide funds and external resources for the healthy development of higher education [2]. Wang Bingqi and others through the government, universities and society game process research, found that in the three game process, completed the allocation of university teaching resources [3]. On the basis of analyzing the internal problems of universities, Dai Nianhong found that the phenomena of emphasizing management over academia and emphasizing scientific research over teaching prevailed in universities, which would have a great impact on the distribution of teaching resources. He proposed that universities should pay equal attention to academia, science and education, encourage teaching and give consideration to efficiency and fairness [4]. Based on the analysis of human, financial and material resources in Colleges and universities, Gao Huige put forward the corresponding policies and institutional suggestions on incentives, management, channels and finance. [5].

Secondly, mode of resources sharing. After decades of development, China's higher education has gradually explored and established various types of resource sharing modes on the basis of drawing lessons from foreign advanced experience. For example, the scale of the university town agglomeration, University Alliance and so on. Through the analysis of the strategic alliance model of colleges and universities, Yang Rongwei draws a conclusion that colleges and universities should choose the appropriate sharing model and formulate a reasonable sharing system in the process of university resource sharing according to their own actual situation [6]. Zhou Qiaoling and others believe that education, as a public consumer product, can form university educational resources from two aspects of consumption and production [7]. Rao Peng, by analyzing the correlation between property right system reform and higher education resources, believes that the innovation mode of industrialization should be adopted to reduce the impact of the system on higher education resources [8].

Thirdly, range of resources sharing. Wu Lei and others concluded that university resource sharing mainly includes human resources, material resources, comprehensive resources and intangible resources [9]. Academic Common Market, which originated in the United States, is essentially the sharing of curriculum resources among universities. Through sharing, it can not only reduce the duplication of low-level and low-benefit majors, but also better support the universities that have set up the majors. Chen Zhiqing and others introduced the resource sharing methods of Japanese University libraries, pointing out that Japan has a large number of interlibrary lending systems of academic information centers, integrated catalogue systems of academic information centers, and electronic journal alliances, which can give full play to the advantages of academic sharing in Japan [10]. In order to promote the sharing of digital learning resources in the field of higher education, the World Economic Cooperation and Development Organization (OECD) has implemented the Open Educational Resources Program, which provides digital information and resources to teachers, students and social researchers free of charge and reduces the barriers for learners to access resources through the Internet.

4. Problems to be solved in the sharing mechanism of regional practical teaching resources

Regional practical teaching resources sharing is a development direction of practical teaching resources construction in Colleges and universities. It is one of the effective ways to improve the investment efficiency of practical teaching resources construction funds and solve the low utilization rate and shortage of experimental instruments and equipment in Colleges and universities. However, there are many problems to be solved in the process of construction and development.

4.1 The Target Differences of Sharing Subjects

The sharing subjects of practical teaching resources have different goals for sharing practical teaching resources. The primary goal of colleges and universities is to cultivate talents and transfer knowledge and technology while that of enterprises is to seek profits and maximize profits. Even

different colleges and universities, what's more, have different objectives. Some colleges and universities share practical teaching resources to improve the technical skills of talents, while others pay attention to technical research and development. In the process of sharing, when the goals of both sides deviate or even contradict, there will be sharing obstacles.

4.2 Communication and Cooperation of Sharing Subjects

The sharing subjects' different value orientations towards sharing practical teaching resources can easily lead to contradictions between the two sides. When the two sides lack sufficient communication, their understanding of sharing will deviate, which will lead to the decrease of sharing initiative and enthusiasm. And insufficient communication also brings ambiguous rights and obligations in the process of resources sharing, which may result in the termination of sharing.

4.3 Resources allocation of sharing subjects

Unfair distribution of practical teaching resources to the sharing subjects restricts the depth of sharing. And inadequate communication between resource builders and users often causes unspecific sharing mechanism, and gives rise to problems such as unequal resources distribution and benefits allocation in the process of implementation, which will inevitably bring disadvantages to resources sharing.

4.4 Technological problems of platform for resources sharing

The technology of sharing platform restricts the breadth of practical teaching resources sharing. Due to the geographical influence of both sides, it is impossible to concentrate on one place to carry out construction, which inevitably results in the discreteness of practical teaching resources. Therefore, it is essential to build a platform through technical means and integrate the discrete practical teaching resources in the region to expand the scope of sharing.

5. Conclusion

The sharing of practical teaching resources is the ineviTable outcome of the development of higher education and social economy to a certain stage. The sharing of practical teaching resources among universities, enterprises and departments is bound to become increasingly close. It is critical for colleges and universities to focus on the development of cloud computing technology, study the sharing mechanism of practical teaching resources in the cloud environment, find a unified goal of sharing among different sharing subjects, build an effective communication channel, solve the problems of resources allocation of sharing subjects, and build a sharing platform to integrate the discrete practical teaching resources in the region.

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