

# Researching on College Teaching Resources Database Construction Based on Cloud Computing

Lidan Feng

Liuzhou Railway Vocational Technical College, Liuzhou, 545036, China

Email: fldcreed@126.com

**Keywords:** Cloud Computing; Teaching Resources Storehouse; Resource Sharing

**Abstract.** This paper analyzes the existing problems on teaching resources database of colleges, expounds the features and advantages of cloud computing, besides, throw out some suggestion for college teaching resource database construction strategy and operation management mechanism based on cloud computing, provide new ideas for Construction of sharing platform of teaching resources in Colleges and Universities.

## Introduction

The construction of teaching resources is the basis of education information system engineering, due to the rapid development of information technology and the application of multimedia technology in recent years, education departments and local colleges and started the tide of construction of digital teaching resource, amount of information resources of network teaching platform risen sharply. But on the whole, teaching resources in different regions with many insurmountable technical barriers in information sharing and communication. But cloud computing as a new generation of technology, it can realize the distributed and heterogeneous resources in a unified management and scheduling, it also provide a new direction of development for promote the construction and sharing of digital teaching platform and for real people learning and the lifelong learning.

## The Existing Teaching Resources of Colleges and Universities Database Problems

Teaching resource database is based on computer network, digital teaching resources according to certain norms and standards to collect and integrate a variety of media materials, that is multimedia teaching system is to provide support services for teaching<sup>[1]</sup>. At present, there are problems of the colleges and universities in the construction of teaching resources as follows:

Teaching resources storehouse construction equipment investment cost a lot. Colleges and universities In the resource database construction often need to invest a lot of money to buy the software and hardware equipment. Because of the rapid development of information technology, the frequency and the hardware update more quickly, it is not only cause waste of resources, but also makes the project funding has become a heavy burden on the resources construction.

Resource data format without the establishment of a unified standard. The information that resource database upload comes from different departments and developers, because of the lack of data format standard. Many resources in the design development and did not from the point of view of teacher and learner needs, but only in order to pursue the visual effect and technology innovation, too much to select non universal media format to distribute resources, it cause most end users because of technical limitations and can't read or web resources, seriously affecting the resource library the sharing and learning support service.

The lack of effective management, interaction and sharing is not strong. The resource database platform can only centralized storage and management mode to meet local or a small number of users, when a large number of users simultaneously landing the platform, it often cause information congestion, unable to access the situation moreover, due to the different schools and different

disciplines by the application of the resource platform self system, also affects the effectiveness of teaching resources sharing and exchanges in a wide range of largely.

Resource platform follows-up construction work. Many colleges and universities ignore resource database tracking, evaluation of resources database construction and improvement of the later stage results, besides, they lack of rational planning of long-term construction for its promotion and application, updating the information of resource platform and maintenance work lag seriously.

### **The Characteristics and Advantages of Cloud Computing**

In recent years, cloud computing has been gradually deepening of Internet application at each corner as a new information storage and service mode, but in the academic circle on cloud computing is still not formed a unified definition, by synthesizing most literature, it can be described as:it is a calculation based on the Internet, it is based on the public standard and service,it is with the Internet as the center, according to user needs to provide safe, fast, convenient, easy expansion of the data storage and network computing services <sup>[2]</sup>. The characteristics and advantages of cloud computing are mainly in the following aspects:

It saves equipment costs. In the cloud computing model, a large number of hardware equipments and software services are placed in the "cloud" in the server, and all applications are following the specific standard and protocol processing in the "cloud". The user may at any time access to relevant resources and services through the Internet terminal according to the demand,the computer hardware configuration, equipment operation and maintenance expenses room construction spending is in charge of the cloud service provider, effectively avoid duplicate construction of hardware, network equipment, information system, which can greatly reduce the cost of equipment investment.

The powerful computing capability has. The cloud server can be unified dispatch hundreds of thousands or even millions of computers. It has high computational and storage capacity. Use of massive information storage high-speed Internet connection and is located in the "cloud", for a large number of simultaneous users submit request (query, calculation of response), rapidly and accurately complete the various business requirements. In addition,the highly centralized data management of cloud computing model and the strict access control mechanism can effectively avoid data loss, viruses and other problems,so it ensure security of the data.

It has very good generality and scalability. Cloud computing is not limited to a specific application, it can realize data sharing and applications among different devices. Besides, it can also meet the need of constantly updated application and different user scale growth, such as crossing platform data sharing, storing resource capacity etc. So its infrastructure is usually higher and more flexible and more efficient than the traditional single server.

Personalized service oriented user demand. Cloud computing can maximize the integration of internet source,simplifies the terminal hardware configuration and reduces the difficulty of application, provides the most simple way for users to access data, and according to the different needs of users to provide on-demand customized personalized service as well.

### **The Construction of Teaching Resources Database's Strategy Based on Cloud Computing**

Formulating the teaching resources standard. Under the cloud computing, sharing teaching resources need the very strong versatility of data, so we must formulate a unified standard specification, including the establishment of meta data standard and the standard of data interface, to realize the integration of resources.

Metadata is data about data, it is mainly to describe the data property information and used to support function such as indicating a storage location, historical data, resource search, file record. <sup>[3]</sup>.The constitution of metadata standard can contribute to the mass of information on the repository of classifying management and description, and establishing readable framework and index, so as to provide service support to call and download resources quickly and retrieve accurately for users. In addition, in order to ensure the management system among the different cloud servers can be used to

exchange and share data, it also needs to set up the standard of data interface, which make architecture specification, interface specification, communication protocol and data model.

Creating a cloud management platform integrated. At present, most colleges and universities in the teaching management in general use of several or even a dozen different management systems, such as "the educational administration management system management system", "curriculum examination management system", "the books management system management system". But the establishment of a cloud management platform can transmit the collection of each application system data to the cloud server acquisition, realize the interconnection of all kinds of data information management system of the campus, and in accordance with the dynamic priority allocation of resources application, thus, its efficient management mechanism, the function and the high levels of the virtual means provide strong support for collaborative work. Users can also according to the permission level in the resource pool quick query, access to different information of the management system and expand the human-computer interaction mechanism.

Resource library and Internet close suture. In the context of cloud computing, teaching resource library schools through a tight suture and the Internet, the user could not be limited from the storage capacity of the machine equipment, software environment constraints, whenever and wherever possible upload save the resource in the cloud server. Teachers, teaching assistants and students can participate in the construction, the renewal and the maintenance work of teaching resource library independently and easily, so that the sharing of resources to maximize the width and breadth.

Development of mobile technology and intelligent device, the scale of user of portable terminal device used in domestic mobile phone, tablet computer access to network has reached 356000000, mobile learning has become inevitable trend of reforming the way of the future. Because cloud computing has high flexibility, expansibility and based on the advantages of the Web operating system, the user only needs to connect to the Internet via mobile device client software, they can whenever and wherever possible access to cloud resources and information services, personalized learning environment, it is conducive to the establishment of the learning society.

## **Teaching Resources Management Security Mechanism Based on Cloud Computing**

### **1. To improve the teaching resource database operation and maintenance mechanism**

Improve resource management and service system, to ensure that the resources of information and data index directory will be updated, realize the institutional repository with other systems and environment with seamless connection, and concentrated control and manage the teaching resource library Cloud platform based equipment and the client software, and build a variety of emergency maintenance program in the same time, to solve problems in a shared environment and demands of cloud users in a timely fashion.

### **2. Standard the teaching resources examination and evaluation mechanism**

Establish relevant system to assess to the teaching resources of cloud platform development quality, sharing of results evaluation, establishes a set of evaluation of the quality of teaching resources construction model and the evaluation index system. Browsing hits and download times of resource can be included into the weight of evaluation index, and according to the weight of the quantitative calculation, to evaluate real-time star rating of resources automatically; at the same time, the users can also make a teaching evaluation for the application affect of resource, puts forward improvement suggestions and opinions to promote resources continue to improve.

### **3. Establish the mechanism of teaching resources and sharing incentive.**

In order to stimulate the teachers, students, social learning and other users to participate in the resources construction and renovation work, we can consider to use membership points system and exchange the mutual mode. Users can get the free resources or integral that system provided when they are in the repository platform registration, Reward the developers of high-quality teaching resources for and active providers, and guide students to make full use of teaching resources storehouse platform cloud implementation of teaching and learning, promoting the reform of education and teaching.

#### 4. Strengthen the protection of intellectual property rights

To strengthen the protection of intellectual property of teaching resources, the intellectual property rights management technology usually as follows: data encryption technology, electronic watermarking, digital fingerprinting technology, authentication technology, intrusion detection technology etc... In addition, we also can make the copyright information marked on the public resources of a prominent position, and explain the license to use the resources of specific conditions. When encourage to disseminate and share the resources information, safeguard the rights and interests should also strive to maintain intellectual creators, efficiency and fairness at the same time, it will create more knowledge and wealth of the community.

### **Conclusion**

Cloud computing is a burgeoning emerging as a shared infrastructure mode, by the standardization, coordination of dispatching and unified management of resources, it has caused great changes in the way people work and learning mode. The teaching resource library based on cloud computing, with its powerful computing, storage and service ability, Greatly promoted the construction of high-quality teaching resources sharing in Colleges and Universities, improve the utilization rate of resources and brought new development opportunities for the information construction of colleges and universities in china.

### **Acknowledgement**

In this paper, the research was sponsored by Guangxi higher education reform project fund in 2013 (Project No.2013JGZ200).

### **References**

- [1] Junchen Ma. Network Teaching Resource Database Construction under the Cloud Computing Environment[J].China Education Info, 2010 (09) 17-19.
- [2] Baixiang Sun. Cloud Computing -- the New Pattern of Higher Education Information Construction and Development [J]. China Educational Technology, 2010 (05)123-125.
- [3] Wikipedia [DB/OL].<http://zh.wikipedia.org/wiki>.
- [4] Fucheng Wang. The Research of College Teaching Resource Integration Based on Cloud Computing [J]. Fujian Computer, 2011(02)32-34.
- [5] Yanling Shang, Fangzheng Gao. Research on the Application of Cloud Computer Assisted Instruction [J]. Journal of Anyang Normal University, 2012 (05)126-128.