

The Constructions of Physics Teaching Resources Database Based on Cloud Hosting

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Abstract - In the information education background, a multimedia teaching resource database is the important foundation to ensure the effective E-teaching. A design scheme of physics teaching resources database has been put forward based on cloud hosting. In the scheme, the project background is analyzed, with the emphasis on the cloud and the embedded resource management functions in order to manage teaching resources. In the implementation, the experiences and suggestions in the process were provided by taking university physics as an example.

Index Terms - the teaching recourse database, cloud hosting, intelligent terminal, E-teaching

1. Introduction

Promulgated by the China Ministry of education in 2012 March "Ten year plan for the development of education informatization in 2011-2020)", "Information technologies have a revolutionary impact on the development of education, which has been attacked with much importance".[1] With the development and widespread of network, E-teaching has become one of the most important ways of educating and researching.[2] In view of this, it is necessary that we should construct a multimedia teaching resources database in order to meet students' various learning needs.

2. Background

A. *The lower technical threshold*

America National Institute of standards and Technology (NIST) definition: cloud computing is a pay per use pattern, as well as this pattern is available, convenient, on-demand network access to computing resources, configurable shared pool (resources including network, servers, storage, applications, services), and these resources can be quickly provided, which can be done by only small investment management, or very little interaction with the service provider. "[3]

Nowadays, an important research domain of educational technology is to reduce the difficulty in teaching resources construction, and the emphasis is on using the network teaching platform and resources management function. Cloud services will these aspirations into reality. If the public network space is treated as a space of education and teaching, its popularity and ease of use, will be of great vitality and attraction.

Teachers and students only need to design and provide the material that can be used without involving the technical problem generally. In other words, teachers and students can

use it like the office softwares to make the teaching resources of the different types of network.

B. *The popularity of many kinds of intelligent terminal*

In the last decades, although the network developed, the students are mostly confined to learn by the desktop computer in the cyber bars or network classrooms in the desktop. Nowadays many kinds of intelligent terminal have been appeared. Especially the intelligent mobile phone has basically replaced the traditional mobile phone. In China, mobile phone internet users have 0.42 billion, meaning that the handheld intelligent is popular. One can exchange informations whenever and wherever possible.

The public teaching space network depending on the cloud or QQ homepage space has developed a mobile phone version. In fact, the development of new network media Tencent etc has a profound impact on learning methods and learning habits of internet users. Tencent Inc public information display, till 31 Dec., 2012, the number of active users of QQ instant communication reached 0.80 billion, the highest online account number 0.18 billion as the official stated. [4] Tencent products have impacted the development and change of hundreds of millions of internet users in communication and living habits.

Student netizens are important participants in public network space, as well as a variety of information sharing and contributors. Some special network learning systems targeted for students are not used frequently, but more on browsing QQ space, social networking platform. Many students after 90 ages in middle school has opened a QQ account, and generally with daily login.

C. *The rich digital teaching resources of network*

Digital resources are necessary conditions for the construction of the database. [5] Digital learning resources being the sum of which the learning resources can be made use of the computer network, specifically refer to all the form of electronic data informations, images, sounds, videos, texts, animation and other forms of storage in the carrier optical, magnetic, flash and other non paper medium.

With lowering the threshold for multimedia production tools and technology, as well as more people to participate in the resources construction work, the amount of resources will be richer. In addition, integration of science and technology, overlapping and interdisciplinary, also makes all kinds of engineering case rich.

Only the digital resources digitization be can communicated or reproduced through the network. Today, with the development of information technology, everyone is the sharing of information, as well as the information manufacturer. However, if the database only relies on teachers to provide information, it is difficult to meet students' needs. Under the guidance of the teachers, the students can be involved in manufacturing and mining materials. Scientists and engineers in society will also be the important operator in the process.

3. Constructions of Database for Physics Course in University Based on Cloud Hosting

The reason of selection of university physics course as a test course is for its representative as a basic course in science and engineering courses. The need for auxiliary teaching design materials, such as audio and video, electronic teaching plan, project case, simulation program, in this course, can basically be reflected.

A. To obtain high quality material database resources

1) *Looking for engineering education material in daily life.* In fact, as long as we carefully observe life, pay attention to some related goods and physical principles of life; it is possible to obtain engineering education material wealth.

2) *Looking for the physical principle application material in complex engineering system.* A complex engineering system as itself is a material resource. It may be theoretical knowledge involved mechanics, thermodynamics, optics, electronics and other branches. If we were to break it up, we will obtain the corresponding material.

3) *Looking for engineering education material from the subsequent course of students.* University physics is a basic course for engineering students following courses, where the existence of cross nature and continue on the content.

B. Using 360 cloud acting as the storage space

360 clouds, the product shared by Qihoo Inc, is a kind of file storage with large memory capacity, security, free visiting, portability, and stability. The storage space and the flow of 360 clouds are no limited, so it can be regarded as the storage space and the center of information distribution. With the advent of cloud, cloud is used as a model for cloud storage, cloud computing can be said to be applied to real life one of the common application pattern. [6]

The 360 cloud operations provided by windows, file folders is the most basic storage unit in practice. The basic mode of file organization is the hierarchical folders: the first, then the second, then the third, n sub folders, where n is what can allow in theory. Besides the containing structure, the parallel structure is also used widely. Fig.1 shows us the schematic topology for files storage.

When we use the cloud to create a database, we should draw the schematic topology between files, then we according to the topology of the graph to create the corresponding hierarchical folders. Obviously the final level folder is to store files.

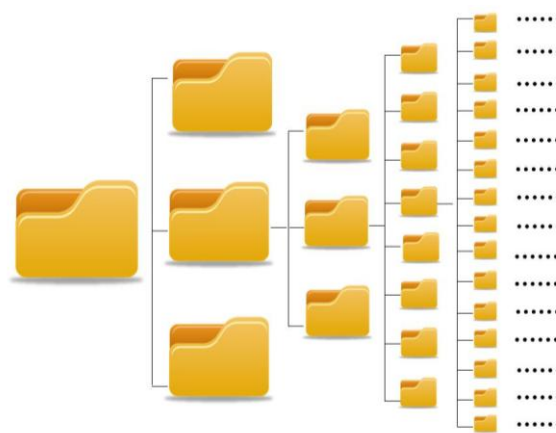


Fig.1. Schematic topology for files storage

C. The use of database resources

E-learning community is an important form of learning in the Internet space. Its role is mainly reflected in the following three aspects: the cognitive information support, interpersonal support, and common development. 360 clouds allow users to create file sharing group, all users in the file sharing group would constitute a "learning community". As a teacher you can create multiple file sharing group, students are then invited to join the corresponding sharing group, thus we will find the formation of a "learning community".



Fig.2. Screenshot of resources released from home page in the QQ space

360 clouds at present cannot directly to release resources in the form of web-page. We noticed such a fact that QQ is one of the most popular instant communication platform used by students. "My Clip Blog " module in QQ spaces supports text editing, inserting pictures, audios and videos links, so it can be regarded as the home page in order to release informations. [7]

The teaching files, videos, animations, experimental video resources, are first uploaded to the network cloud. Through the embedded file sharing features, the hyperlink can be made, and then the link is edited to a log in QQ space. In this way, it is convenient for students to access and download it.

D. Daily maintenance of the database

According to the needs of maintenance of the database, we can invite senior students with the subject experiences as the assistant manager. The teacher can use the module named "vote" in QQ space to track the students' learning status. The related problems were made of questionnaire, and various options were collected for selection. According to the students' answers, teachers can adjust material release strategies, timely answering questions for students.

In order to realize the sustainable renewal of resources, designers can upload videos in 360 clouds, and then make resources be set to "share", and invite the students to be the 360 cloud users to share video resources. [8] Usually students through intelligent terminals such as mobile phone realize playing online. Students are encouraged to shoot micro-videos concerning physical phenomena by using intelligent terminal, and a physical problem in life, and as well to record micro-film. Students can use a variety of intelligent terminal to upload resources to the database.

4. Good Effects

The effect of the operation using the database based on cloud hosting in practice, need to be evaluated from teachers, students, managers, the construction of lifelong education etc...

A. Another new teaching bridge for teachers

From the view point of teachers, the database becomes the second classes that can be fully utilized. In some special sections of the content, the model can be realized, which named "the virtual classroom is dominant, and the real classroom enhances it". [9]

B. Another new knowledge channel for students

From the perspective of students, the database becomes the second class, which is obviously beneficial supplement to the traditional classroom teaching, and through which it is possible to browse the learning content whenever and wherever, download files, and watch online video, online test, informations feedback, etc...

C. Another new channel saving expenditure for managers

As long as the education departments strengthen guidance and certain material encouragement, at the appropriate time, the in-depth development of the database can be achieved, and the auxiliary teaching platform by network public space construction will be able to achieve all or part of the functions of professional network course platform with little cost.

D. Help build lifelong teaching platform

Lifelong learning is an inevitable trend of social development. The partner relationship between teachers and

students can be maintained for a long time, and the teacher can well understand the dynamic graduate students. Through this channel, teachers can understand their encounter or using in the physical knowledge to make the teaching knowledge more closely associated with the engineering practice, as well as students can also continue to get the guidance from teachers through this channel.

5. Conclusions

Compared to the professional teaching resource database in commercial, the database based on cloud hosting has the features, such as popularity, free of charge, easiness to use, convenient sharing. For the direct stakeholders, teachers, students, school managers, all three will benefit from it. In this way, a point of information technology in education and teacher skills closely can be observed. With the further development of educational information, various embedded management functions by much easiness to use and sharing of continuous improvement, the constructions of the database based on cloud hosting has broad prospects and can be worthy researched.

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