

Cloud Computing—New Web-based Training Mode for Art and Design Teachers in College

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Abstract—With the development of the technology of cloud computing, its application in education field has become a hot issue. This paper discusses the building of cloud computing training mode for art and design teachers, and analyzes the urgency to train teachers as well as the advantages of cloud computing in web-based training mode. A new web-based training mode based on cloud computing is proposed for art and design teachers, which will play a valuable role in related research.

Keywords- cloud computing; art design; web-based training;

I. INTRODUCTION

Nowadays, the Art and Design Education is in the unprecedented development stage. It is the main teaching objective that training students' hands-on ability and innovative sense. The concept of teachers' education and knowledge which updated constantly is the key to the innovation on Art and Design Education. It is required that colleges should establish the "Double Type" Teacher Team which can satisfy the modern technology teaching and has rich practical experience[1]. The so-called "dual-qualified" teacher means college teachers should have extensive and solid professional knowledge as well as systematical and comprehensive theoretical knowledge; what's more, they should have a cornucopia of practical ability and know all kinds of new materials, techniques and methods.

How to cultivate more "Double Type" art and design teachers is the top priority of the all colleges and universities. However,[2] due to the shortage of training funds, it is not practical to select and send some excellent teachers to institutions for further learning every year. However, due to the shortage of training funds, it is not practical to select and send some excellent teachers to institutions for further learning every year. Many colleges, relying on modern information technology, develop and use online education resources, establish an open and dynamic network training platform and help teachers realize long distance learning and communication. This kind of network platform is extensive, effective, instant, and interactive and beyond space; it is fully affirmed/ accepted and it will make the teaching and training more scientific[3].

In the process of promoting online training, most colleges need to purchase a great deal of servers and related software,

design studios, develop training platform and maintain hardware, software and the network. In this mode, the training platform development cycle has disadvantages for example the long development time, high maintenance costs, besides it has several bad impacts, such as inconvenient share resources lack of flexibility and agility, lower resource utilization and ineffective training effect[4]. The Cloud computing technology which is advocated and advanced by Google, Yahoo, Hewlett-Packard, Intel, IBM and other leading IT companies provides a new model for the College of Art and Design teacher training[5].

II. THE DEFINITION AND CHARACTERISTICS OF CLOUD COMPUTING

A. Concept of Cloud Computing

Cloud Computing is a kind of emerging commercial calculation mode which distribute the computing tasks into a mass of resource pooling consist of computers. This enable the application to get the computing power, storage space, and all kinds of Software Service in need. "Cloud" means the network which afford the basic hardware, system platform or software program. This kind of resource exists as a distributive way in physics which can distribute and extend in need dynamically."Terminal" means the user. They can get the hardware and software resources through the Internet whenever and wherever possible, just like to pay for the utilities which can use it in need. But this has to pay according to the processor capacity, storage usage, broadband consumption[6].

B. Characteristics of Cloud Computing

The core idea of Cloud Computing is service, so the service accomplished by Cloud Computing is called "Cloud Service". The characteristics and its superiority can be shown below:

- Cloud Storage data. Users only have to store in the mass storage space Cloud Computing offered by Cloud Computing. It not only can save the cost and use the resources reasonably but also can make a integration and share according to authority when safety storage is ensured.
- The Cloud offer software service.Countless software programmes all placed in the server of the cloud, all

software is build beyond various kinds of standards and agreements, means the users can use them without even download them. And it's feasible if a lot of people collaborate through the Internet.

- To offer service whenever and wherever possible. The hardware configuration of terminal users had been simplified by the service which Cloud Computing offered, users can enjoy the Cloud Service easily only if the hardware device can connect to the Internet and login in the account number of the platform he uses.
- Fully meet user demand for the service. As cloud computing integration network resources, so it can provide users with personalized services according to the needs of different users, and with the increasing number of users, the integration of resources and the provision of services will be more user-friendly and easy to get.

C. Cloud computing and the combination of the field of education

With the progressive development and popularization of the cloud computing model, schools, educational institutions and personal information will be handled gradually migrated to the "cloud" on the network learning have a positive impact. Cloud computing minimized function to maximize the performance of personal computers in this mode.

Encapsulates all the information and resources into a "cloud service" at any time, from any location, via cell phone, PDA (Personal Digital Assistant, personal digital assistant) or laptop to use in the form of "cloud services" view online "cloud" electronic lesson plans, instructional videos, and a variety of electronic library resources at any time into the simulation environment for simulation. This allocation and management of resources needed what college teachers network training platform[7].

III. CLOUD COMPUTING ADVANTAGES OF TRAINING AT THE UNIVERSITY OF ART AND DESIGN TEACHER NETWORK

A. The lower cost of cloud computing

Network training mode based on cloud computing college teachers can take full advantage of the old computer, a cheap netbook and smart phone access cloud services according to the needs of the lease and purchase of the "cloud" services, you can get a small amount of rent improve the hardware environment, and without regard to the problem of technical updates and product upgrading, equivalent to always have the latest technology hardware.

In theory, university invested in training platform zero, significant savings in input costs and maintenance costs.

As everyone knows, the high price of design software, updated quickly, while cloud computing can provide a large number of design application software customization services for the university network training platform, through the software services. Teachers access cloud services, no account shall be taken software copyright issue, whether it is the latest version, etc. they can enjoy the low-cost

application software, which the cloud computing provides. Then reduce greatly of the input costs on maintenance and upgrading of the operating system and application software.

B. 2. Cloud computing can promote teachers' research and professional skills

Cloud service users :The artistic teachers ^o		
Linked internet equipments ^o		
Artistic resource and image applied procedure ^o		
Learning resource and service(open and copyright) ^o	creation and editing Communication and content management ^o	Research cooperation ^o
TXT ^o	Create and edit image ^o	Discuss with others about professional skills ^o
Digital library ^o	Word processing ^o	Subject release and cooperation ^o
Video database ^o	Audio, video capture ^o	Creative design cooperation ^o
	Release platform: blog, wiki ^o	Homework release and cooperation ^o
	Produce and edit teaching course ware ^o	Resource sharing management ^o
Comment platform ^o		
Public cloud and private cloud -software services, database and knowledge base ^o		

Figure 1. Cloud provide training integration service

From cloud computing can provide training required for the integrated software services (See figure 1), so that teachers access more updated learning resources faster, improve learning efficiency, shorten the cycle of teacher training.

In addition, in cloud computing, art teachers can explore learning the latest cutting-edge expertise with the senior expert at any time. Following the scientific frontier transmission developments and exploring the teaching related issues with the experienced teachers. Updating and improving the teaching quality. It can also construct scientific collaboration platform, strengthening the academic research to promote the communication of achievement[8].

C. Cloud computing provides individualized model for the management of knowledge.

Personal knowledge management refers to a process that the individuals use tools to establish a system with all kinds of the materials and the information they owned, then they will transfer these matters into more valuable knowledge through continuously collecting, perfecting, digesting, absorbing, and innovating. And at present, the personal knowledge management often chooses to use some specialized personal knowledge management software to

categorize, edit, storage, search and share the information. Cloud computing provides a new pattern for the management of the personalized knowledge. Some of the applications based on the cloud computing – there are some typical examples such as the Google files, Baihui network, blog, space etc. while carrying out the network teaching, they can efficiently go on the personal knowledge management in the classification, editing, searching, storage and sharing of the knowledge information. On the knowledge classification, they also provide some general classification methods. Users can also establish personalized knowledge classification system according to their own needs and their actual situation; In the content edition, they can online edit knowledge whenever and wherever by writing a blog post and the log space; In the information searching, they can position the information fast through creating some indexes, bookmarks[9], according to the different arrangements of display the information content in different ways; In the Data storage, The data are stored in the "cloud servers" end safe and reliable. Storage capacity is not restricted; In the sharing of application of knowledge ,the information is stored on the network's "cloud" end, then it can be shared with others at any time, any place, and in a variety of ways to get knowledge and the information content.

IV. DESIGN FOR ART TEACHER TRAINING NETWORK PLATFORM BASED ON CLOUD COMPUTING

A. Platform architecture

As shown in Figure 2, art teacher online training platform architecture based on cloud computing is divided into 4 layers:

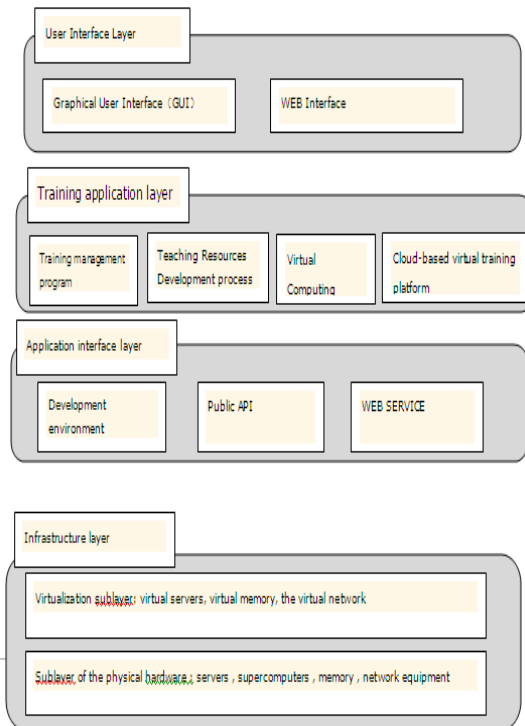


Figure 2. Training cloud architecture

- **Infrastructure layer:** Providing compute, data storage and network communications resources for senior, is providing laas, divided into the physical hardware sub-layer and the virtualization sublayer. Where physical hardware sub-layer of real physical hardware, including servers, storage and network equipment. Virtual sublayer is built on top of the physical hardware sublayer, Management of the underlying hardware virtualization technology, Up virtual computing, data storage and network communications resources, Composed of various types of virtual machines, Current mainstream virtual machine software VMware, XEN, Virtual PC and Virtual-Box.
- **Application interface layer:** Build infrastructure layer oriented developers for developing cloud-based training applications software development environment and common API, for PaaS. Public API to developers, can be provided in the form of Web Service, Such as the Amazon Web Services, Thus eliminating the developers many system management operations. Developers can also use the public API to develop their own Web Service.
- **Training application layer:** Provide a wide range of teaching applications that provide education-oriented SaaS. Contains: For training platform, management system, office systems, and operating systems; For teaching resources developed image processing software, courseware production and presentation software; Virtual computing environment, the bottom design resources for teachers; The cloud-based virtual research platform.
- **User interface layer:** Providing two interfaces for users to access education cloud by Client: traditional graphical user interface (GU) I and a Web-based interface. The help of Web 2.0 technology, education cloud services provided mainly for the B / S structure, so users only need to use a browser will be able to access the service.. Traditional GUI will be used as an adjunct to the Web interface, used for the Remote Login education cloud virtual machine access to the underlying resources[10].

The infrastructure layer is the basis of the whole structure, the use of virtual machine technology to introduce a virtualization layer between the hardware and software. Virtual layer the introduction of independent applications running environment, shielding the dynamic nature of the hardware platform, distribution and heterogeneity, supports the sharing and reuse of hardware resources, and for each user to provide personal independent, isolated computing environment, and at the same time, provides administrators with centralized management of hardware and software resources. The application interface layer on a variety of virtual resources package, eliminating developers many details of system management, convenient, rapid development provides the foundation for cloud computing-

based applications. The education application layer using the application interface layer provides the API to develop all kinds of software, relying on the underlying provision of compute, storage and network resources to run. All software running in the cloud, users simply use ordinary PC (even mobile devices such as PDAs and mobile phones) in the user interface layer, and a browser can use all kinds of software, enjoy cloud computing provides mass storage and unlimited computing power. The same time, the user data stored in the cloud, so there is no need to worry about data loss.

V. CONCLUSION

In short, cloud computing to build the hardware environment, software resources development, the implementation of online teaching and personal knowledge management four aspects of the new operating mode. Revolutionary innovative ideas for the college training. I believe that with the development and improvement of cloud computing technology, cheap, convenient, safety features will make more and more colleges and universities training migrate to the end of the "cloud".

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