

Analysis of Network Teaching Resource Sharing and Interactive Teaching Application Based on Cloud Platform

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Abstract: With the rapid development and popularization of information technology, major universities are now committed to researching network teaching resource sharing and interactive teaching application development activities based on cloud platforms. The main reason is that this can change the hidden dangers of low integration and use of teaching resources, insufficient classroom teaching interactivity, and unscientific management and evaluation in the past, and make the overall education model of universities undergo systematic changes, further highlighting the central position of students as the main body. Therefore, this article will objectively elaborate on the current research status of online teaching resources and platforms at home and abroad, the shortcomings of the current application of network resources in Chinese universities, and the necessity of actively investing in the use of cloud platform technology in the development of educational informatization. Based on practical considerations, it will explore effective measures to use cloud platforms for network resource sharing and interactive teaching.

Keywords: Cloud Platform; Online Teaching; Resource Sharing; Interactive

1. Introduction

The so-called cloud computing is mainly an innovative technology project that regards computing power as a commodity for circulation. It has now been widely promoted and used in various fields and projects in China, especially in the field of higher education, which has effectively curbed the overall lack of education resources, uneven distribution, and low quality in the past. As for what kind of deficiencies are left behind in the internal network resources of Chinese universities, and how to use cloud platforms

for real-time sharing and interactive research guidance, relevant detailed content will be extended in the future.

2. Current Status of Development and Research on Online Teaching Resources at Home and Abroad

The types of educational resources in universities are rich and diverse, which can be further refined into different types such as high-quality, network, hardware and software facilities, and books and literature. Especially after the popularization of information technology, the number of teaching resources in universities has grown rapidly, and many universities have found it more difficult to manage their teaching.

2.1 Domestic Situation

By the end of 2009, more than 40 universities in Shanghai had begun to consider high-quality courses as critical online teaching resources, and more than half of them chose to develop and create networked teaching guidance platforms. Until June 2014, Youmuke Enterprise began to develop about 700000 courses in more than 200 universities nationwide through its comprehensive online education platform, with a cumulative number of visits even exceeding 2.4 billion [1]. In addition, some domestic enterprises are also striving to develop networked and open teaching platforms, such as Baidu Education, NetEase Open Courses, and so on.

2.2 Current Situation Abroad

A representative shared information platform, mainly including the United States Educational Resource Information Center, which has the richest information reserves and the most clicks in the world, as well as free and publicly available course programs at the Massachusetts Institute of Technology in the United States. At the same time, cloud computing developers such as IBM and EMC are also promoting and

implementing cloud computing solutions in American university campuses and internationally, striving to replace traditional distributed computing models with cloud computing technology and further reduce the cost of different academic research processes. Based on this, students can engage in diversified and large-scale cloud computing research activities through the internet [2], such as the East African Health Alliance cloud computing project, which is expanded through virtual computing laboratories, facilitating real-time remote access and observation of important teaching resources for students.

3. The Drawbacks of the Current Application and Management of Online Teaching Resources in Chinese Universities

Although there have been significant achievements in the development of online teaching resources both domestically and internationally, including various types of practical resources such as MOOCs, micro courses, and high-quality courses, there are still shortcomings in application management. The specific details will be as follows [3]:

3.1 Difficulty in Fully Stimulating the Initiative Awareness of Teachers and Students in Research

The design mechanism of most teaching platforms is too cumbersome, that is, blindly yearning for high-end and comprehensive, which makes many teachers and students feel very inconvenient in their daily operations, seriously reducing the subjective initiative of these groups to apply online teaching resources and platforms. In addition, some functions of the platform are difficult to meet practical teaching needs, especially in the process of grading student assignments. The platform can basically only play the role of document uploading and cannot assist teachers in timely online grading.

3.2 Online Teaching Resources have not Been Updated in Real-Time Based on Classroom Teaching Dynamics

Some university teachers are accustomed to uploading teaching calendars, guidance outlines, teaching materials, and other information in real-time according to the standards of their superiors. However, they do not actively update and process the online

materials after they are uploaded, nor do they timely investigate and grasp the learning status of students on these online resources. Over time, online teaching resources have become a simple static display library, insufficient to truly implement online teaching.

3.3 Difficulty in Highlighting Personalized Features When Developing and using Existing Online Teaching Resources and Platforms

At present, the online teaching resources and platforms put into use by major universities can only play the functions of uploading and downloading resources. As for the design of virtual simulation laboratory templates, verification and certification of student homework plagiarism, real-time access and management of remote diversified platforms, etc., they have not yet been implemented. If left unattended for a long time, it will inevitably affect the interactive teaching level of the course.

3.4 Difficulty in Storing, Disseminating, and Accessing Large Amounts of Data on Campus Education Platforms

The online teaching platforms currently used by universities usually cannot upload, share, or access files larger than 1GB. Although some platforms do have the ability to upload large files, the entire transmission process takes too much time. At the same time, there are still many teaching resources that exist in the form of videos, which makes it difficult for other types of important teaching materials to be disseminated to students in a timely manner, resulting in a continuous decrease in the effectiveness of online teaching.

4. The Necessity of Actively Promoting the Use of Cloud Computing Technology in the Development of Educational Informatization

Cloud computing technology includes many advantages and features such as distributed and grid computing, and advocates the use of leasing methods to provide targeted information sharing services to the general public, which can ensure a significant improvement in the utilization of educational resources in universities, fully handle the many problems of hardware and software resource management under heterogeneous and

homogeneous conditions in the past, and most importantly, It can ensure the dynamic expansion and allocation of resources in accordance with the development trends of higher education. In 2009, China successfully held the first cloud computing assisted teaching advanced training theme event in Shanghai, with the core goal of vigorously promoting the development of cloud computing assisted teaching technology, so that various universities can increase their attention and application efforts. As for the necessity of actively introducing cloud computing technology in the development of educational informatization, it is mainly manifested through the following aspects [4]:

4.1 Convenient Real-Time Sharing of Educational Resources, Catering to the Future Development Trend of the Education Industry

Cloud computing technology can ensure timely integration of mass educational resources, which means that previously isolated educational resources are unified into the cloud, forming a comprehensive resource pool.

4.2 Helps to Reduce the Cost of Education Consumption and Avoid Excessive Waste of Resources

Cloud computing technology usually does not have high requirements for user access configuration. As long as users have broadband cloud computing access interfaces, they can operate normally for a long time without the need to add more high-end hardware and software resources, and thus will not consume too much cost. At the same time, cloud computing technology can also provide personalized customization services, and any commonly used program can be centrally supplied in the cloud.

4.3 Can Fully Stimulate Students' Desire for Self-Directed Learning

Cloud computing technology retains strong interactive communication capabilities, allowing students to engage in real-time interactive discussions in the cloud, achieving self-learning and progress. During this period, teachers have transformed from being learning promoters to guiding learners, that is, by carefully observing and certifying the dynamic

learning situation of students, and then providing targeted guidance to individuals.

4.4 Can Provide More Convenient, Diverse, and Sensitive Teaching Methods

The emergence of desktop cloud has comprehensively solved problems such as interactive learning between teachers and students, uploading large memory resources, real-time submission of assignments, and online classroom inspections in the past. After the development and use of server cloud, software and hardware virtualization, exam server system deployment, office automation and other functions can be fully utilized, and teachers and students can learn and communicate anytime and anywhere through the network.

5. Key Points to Pay Attention to When Using Cloud Platforms for Online Teaching Resource Sharing and Interactive Teaching

Up to now, major universities in China have collaborated with central and local governments to create specialized private cloud laboratories. At the same time, virtual computers with 2GB of memory, 500GB of hard disk, and 3.0GB of main frequency CPU have been configured for different professional guidance teachers, and virtual computers with 4GB of memory, 200GB of hard disk, and 3.0GB of main frequency have been configured for more than 2000 students in universities. In order to fully utilize the cloud platform to arrange and verify different homework content, universities still need to carry out comprehensive development and construction through the following types of details.

5.1 Fully Develop and Utilize Cloud Hardware Resources to Continuously Improve the Teaching Environment and Conditions

The computer center located within the university should not only be responsible for handling the daily teaching guidance tasks of its students, but also ensure efficient organization of teaching activities such as higher mathematics, computer level exams, and English listening throughout the school. In the past, universities used to spend a lot of money on purchasing computers in bulk every year. Now, all these functions will be ported to

cloud virtual platforms, and teaching conditions for different majors will be optimized and adjusted accordingly [4,5].

5.2 Utilize the Storage Function of the Application Cloud Platform to Create a Professional Course Resource Sharing System That Covers the Entire School

Universities must urge every professional teacher to upload the latest course resources collected, including teaching calendars, guidance outlines, teaching guidance plans, guided courseware, experimental content, homework, etc., to a unified cloud platform, forming a comprehensive cloud platform teaching resource library, which facilitates students to search, watch, and download learning anytime and anywhere. In this way, it is possible to quickly solve the conflicting problems of traditional online teaching platforms and resources being too single, unable to achieve interactive sharing and quick access between teachers and students.

5.3 Set up an Experimental Teaching Center Based on Cloud Virtual Simulation Function

After the introduction of information technology in various majors in Chinese universities, the teaching mode between teachers and students has also undergone systematic changes. For example, students crave computer desktops filled with personalized features to facilitate diversified experimental operations and learning research; and teachers need to freely switch between different types of teaching guidance environments during courseware production and classroom explanations, which include customized and rapid teaching needs that traditional decentralized management models cannot meet. By comparison, cloud desktops can fully meet the above standards, which is to assist college students in freely learning and researching through the Internet, based on the open operation of a wall free university teaching system.

6. Effective Strategies for Universities to Cooperate with Cloud Platform Network Resource Sharing and Interaction Functions in Teaching Practice in the Future

In order to fully leverage the advantages of cloud platforms in professional teaching, this

article will explore the control details of innovative interactive classroom teaching based on two types of courses: wireless network technology and Linux into technology. The main content is as follows:

6.1 Developing Practical and Innovative Online Course Resources

Firstly, design a sufficiently comprehensive and reliable teaching calendar and guidance outline to ensure that relevant professional students can grasp the key content of this course in the first time, and then flexibly adapt to various guidance modes arranged by the teacher, without affecting the overall progress of the course explanation.

Secondly, create electronic lesson plan resources to provide real-time observation and reference for relevant professional teachers and students.

Thirdly, provide a focused explanation. Ultimately, it is to present the key and difficult issues in the course vividly through video recording and playback, attracting students' attention and activating their research initiative. Fourthly, explore and exchange ideas. It requires teachers to set clear interactive discussion questions based on the current actual teaching progress, implementation effectiveness of lesson plans, etc., so that students can brainstorm and effectively solve the key and difficult problems in the curriculum.

Fifth, integrate more types of resources. By providing diversified multimedia resources such as images, animations, audio and video, as well as guiding materials, the classroom teaching content can be improved in a timely manner.

Sixth, assign homework reasonably. It is to require teachers to assign homework in a timely manner through the cloud platform, clarifying the detailed arrangement of homework and the directions involved, as well as the rules for subsequent grading and submission deadlines [5].

Seventh, conduct experiments in a standardized manner. Provide electronic texts such as experimental operation manuals, arrangements, requirements, and report writing standards on the cloud platform, which students can carefully read in advance and fill in and submit according to the requirements in the future.

Eighth, provide detailed exam self-test content. After each chapter is explained, upload batch related exercises and self-test questions on the cloud platform to ensure that students practice all content in a timely manner and conduct self-learning status checks.

Ninth, set up a cloud virtual desktop. This approach can enable each student to cooperate with the computer to start their personal virtual desktop cloud, further processing the experimental operation tasks in the course in the cloud desktop, and learning to write and test relevant programs correctly.

6.2 Adjusting the Existing Teaching Organization Mode of the Course

Relevant researchers need to cooperate with the advantages of cloud platform technology to develop a more innovative, practical, convenient and fast course teaching organization model. The specific processing content is as follows:

Firstly, clarify the timing to ensure that skill training can be conducted in groups as soon as possible. During this period, students are required to complete relevant operations on the virtual platform within the specified time, including the use of the latest teaching resources and participation in teaching practice training.

Secondly, arrange flexible time reasonably, that is, encourage students to autonomously make appointments on the required mobile interactive platform, where special skill training and demonstrations can be conducted.

Thirdly, properly assign extracurricular homework. Teachers must ensure that they occupy less time for students to complete key content explanation tasks in each class. Afterwards, students need to independently use the platform for comprehensive learning, and independently handle the homework assigned by the teacher through a series of relevant literature searches and supplements [6].

Fourthly, timely organize professional practical operation ability assessment activities. This requires creating a reliable course testing project on the cloud platform in advance, ensuring that each course is assigned nearly 4 projects, and the focus of the project questions is to exercise students' hands-on operation skills. During this period, students must submit engineering reports, source programs, test

reports, summary reports, and other materials based on actual teaching progress.

Fifth, create cloud virtual desktop templates closely related to different courses. The desktop templates here can be basically refined into Windows 7 basic templates, Windows programming templates, Linux programming templates, and so on. As for the tasks of students, they are manually selected and entered into the virtual computer of relevant templates according to the homework and experimental requirements assigned by the teacher, and then complete different types and levels of learning tasks.

6.3 Create a Mechanism that Can Effectively Track, Verify, and Provide Feedback on the Effectiveness of Course Explanations

In order to better practice and apply the online teaching function of cloud platforms, as teachers and students of different majors in the campus, they need to continuously consume a lot of time and energy to learn the key points of platform operation. During this period, teachers will complete daily teaching plans and guide process modification tasks through regular interactive learning and sharing of relevant core resources; Students can create closely connected collaborative learning and communication mechanisms based on cloud platforms. As for the key points of constructing feedback and tracking mechanisms in the process of collaborating with cloud platforms for network teaching resource sharing and interactive teaching, they are as follows:

Firstly, do a good job in tracking and investigating. Carefully observe whether the learning platform is being used properly, ensure timely detection of problems in student applications, and organize relevant thematic discussion activities to ensure the best improvement plan is provided in a timely manner.

Secondly, combining the dynamic feedback results of student learning, updating teaching resources and changing tasks, and developing a more scientific and humane teaching guidance mode.

Thirdly, verify the process of students using cloud platforms. This includes the completion rate of homework, the number of posts and replies, etc., to verify the level of professional

knowledge construction of students and do a good job in the evaluation and certification work in the later stage.

Fourth, communicate separately. Teachers are required to communicate and experience cloud platform applications with each student in a timely manner, ensuring an understanding of their technical application capabilities. Subsequently, we will concentrate on cultivating an elite team and mobilize the enthusiasm of other students to participate in and experience the cloud platform through elite education methods, demonstrating the expected exemplary role.

6.4 Establishing a Brand New Student Performance Evaluation and Certification System

Course grades are a common concern among university teachers, students, leaders, and parents. Note that in the past, many university course grades have shown a certain degree of stability and singularity. In terms of compulsory courses, regular grades account for 20% and final grades account for 80%; In terms of elective courses, the usual grades account for 40%, while the final grades account for 60%. This assessment model is obviously not scientific and reasonable enough, which can easily cause students to have a strong sense of laziness, manifested as not actively attending classes, not being able to submit homework in a timely and complete manner, and frequently engaging in cheating behavior during exams [6].

Faced with the many negative situations mentioned above, as a qualified guidance teacher, it is necessary to strive to make cloud platforms a key entry point. On the one hand, meticulous supervision and management of the dynamic process of student course learning should be carried out to ensure that students can cooperate with cloud virtual desktops for homework processing, experimental operations, and daily self-testing, effectively avoiding the repeated derivation of plagiarism behavior; On the other hand, adjustments should be made to the existing course grade structure system, refining basic indicators such as homework completion status, attendance frequency, quiz scores, participation in engineering training, completion of experiments, and final exam results. At the same time, the final exam proportion should be adjusted to around 40%.

In this way, the learning enthusiasm and ability of college students will be greatly improved.

5. Conclusions

In summary, in the past, Chinese universities often encountered various loopholes in the process of sharing online teaching resources and interactive teaching due to large file memory, failure to update internal computer programs and configurations in a timely manner, which was not conducive to timely sharing of the latest educational experiences and auxiliary resources among teachers in various fields. Moreover, due to limited reference information provided, it reduced the motivation for students to learn independently. Therefore, it is hoped that in the future, various universities can vigorously introduce cloud platform technology to ensure that teachers and students can use lower configuration computers to access the latest teaching auxiliary resources in the platform in real-time, and increase the exchange of ideas and experiences between each other. Over time, it comprehensively stimulates students' initiative in learning, improves the learning efficiency and quality of each major, and cultivates qualified talents for various industries and fields in society.

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