

On the Reform of Computer Education in the Cloud Age

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Abstract: with the development of computer technology, China's demand for computer talents is growing, but the problem of uneven ability of computer talents in Colleges and universities still exists. In the era of cloud computing, a variety of innovative models such as network teaching and cloud computing services have emerged. Starting from the specific problems in the teaching of computer courses in Colleges and universities, combined with the characteristics of cloud computing in the cloud age, this paper puts forward some suggestions for the setting of the contents of computer courses in Colleges and universities, the reform of teaching mode and the change of assessment mode, and suggests that colleges and universities should build their own cloud laboratory to better serve the reform of computer teaching and the scientific research tasks of teachers And help students with computer practice.

1. Introduction

At present, with the rapid development of information technology and the popularization of related technologies, more and more new terms appear in our vision, such as big data, cloud computing, cloud storage and so on, which not only add impetus to the development of the times, but also provide important help for computer teaching. In order to improve the level of computer teaching in Colleges and universities, we should fully integrate cloud computing technology on the basis of traditional classroom teaching, and establish a computer teaching program to adapt to the development of the times. In the process of teaching, we should pay attention to the cultivation of students' practical ability, combined with cloud computing and other new technologies to better help students improve their computer practical ability.

2. The Significance of Computer Education in College Teaching

Due to the differences in the ability and quality of college students, the level of computer mastery is also uneven. Some students begin to study computer in University, while others have mastered computer skills and have strong computer learning ability in middle school. Taking our school as an example, after checking the computer level of graduating students, it is found that many students' computer practical operation level is low, most of them are only familiar with some software installed on the computer, and they are not familiar with common office software such as word and excel, which not only does not meet the requirements of modern enterprises for talents, but also fails to meet the requirements of universities for graduation Requirements for students' basic computer quality. At present, many colleges and universities have entered the era of information campus, e-government and information library and other information products also provide help for the rapid development of school information, computer ability should be valued by students, and enterprises begin to pay attention to students' computer skills when recruiting students. Therefore, it is necessary for colleges and universities to strengthen the cultivation of students' computer ability and improve the requirements of computer teaching.

3. Cloud Computing in the Cloud Era

Cloud computing refers to the remote provision of computing and other application services

through the network. Its role is to enable terminal devices to obtain powerful computer services through the Internet. Users can access the ECS through a browser or desktop application, and get the corresponding services. Cloud computing, which mainly relies on distributed computers, has the characteristics of network storage and virtualization, and is the product of the integration of traditional computer and network technology. Because cloud computing distributes computers on different distributed machines instead of local machines or remote servers, people can obtain the corresponding cloud computing services remotely through any terminal device after obtaining access rights. Therefore, the provision of cloud computing services is not particularly high for the end devices.

Cloud computing has many advantages: first of all, cloud computing can ensure the security of storage data, avoid data leakage, and realize the security monitoring of data. It does not need to spend too much cost while ensuring high reliability. Secondly, the event response speed of cloud computing is very fast. Because its computing relies on distributed computers, its service provision is not easy to make mistakes, and access forensics can be completed in a short time. Third, it has a high security, through the application of various advanced cryptographic algorithms can greatly reduce the possibility of password cracking. Fourth, the logs it records have almost no deadline requirements, which effectively protects the service resources. Fifthly, the firewall of cloud computing is often very powerful, which can improve the security of software. Sixth, the pre control mechanism can effectively reduce the vulnerability and make the security situation detection of services easier. Seventh, safety inspection reduces the overall maintenance cost. At present, cloud computing has gradually become the best tool for enterprises to improve service capacity and production efficiency. Its characteristics and service types are shown in Table 1.

Table 1 Characteristics and Service Types of Cloud Computing

Characteristic	Service type	Realization form
Virtualization Technology	Infrastructure as a service	Software as a service
Dynamic scalability	Platform as a service	network service
Deployment on demand	Software as a service	Platform services
High reliability		Internet integration
High reliability		Business service platform

4. Problems in Computer Teaching in Colleges and Universities

4.1 Passive Role of Students

In the computer classroom of colleges and universities, under the traditional computer teaching, students can only play the role of audience, and teachers can only passively accept the knowledge of students. In this case, students' interest in computer knowledge is not high, and the learning atmosphere is difficult to be active. In most cases, due to the lack of sufficient communication between teachers and students, it is difficult for teachers to understand students' deficiencies in time, resulting in some students can not keep up with the pace of classroom teaching, and students' computer skills are difficult to improve.

4.2 The Old Way of Lecture

Computer itself is a subject with strong operability, but it is not reflected in the teaching process of some colleges and universities. Teachers habitually use multimedia courseware to show the computer operation process, students can not directly practice these operations. In this case, students' computer practice ability can not be exercised. Students are not only unclear about how much computer related knowledge they have mastered, but also whether their understanding of related knowledge is wrong. As a result, students lose interest in computer learning.

4.3 Different Receptivity

The difference of students' ability to accept knowledge is also a big problem in computer teaching. Although the computer course has been set up in junior high school and senior high school, the

computer is still not included in the scope of college entrance examination. There is still a big difference in the frequency of computer contact between urban students and rural students. This difference is not obvious in college entrance examination, but it becomes more obvious in the study of computer related knowledge in University. The difference of students' receptive ability enables some students who accept computer knowledge quickly to complete related learning tasks and build strong learning confidence, while the students with poor receptive ability may gradually give up further computer learning because they can't keep up with the progress

5. The Reform of Computer Teaching Methods in Colleges and Universities in the Era of Cloud Technology

5.1 Curriculum Reform

At present, the main teaching contents of the university computer course system include operating system, programming language, distributed computing principle, hardware knowledge, computer network and other contents. These contents are mainly in the traditional teaching mode of classroom teaching, not only the class hours are tight, but also the practice opportunities that the school can provide for students are few. In the era of cloud computing, relevant teaching can be carried out in the form of online courses. Students can learn various computer related courses remotely through the cloud platform, and can adjust the learning progress according to their own actual situation. Teachers provide more status students with answering questions and practical guidance services. In addition, in the era of cloud computing, we should also increase the teaching of cloud computing and other related knowledge, teach students to use computers to build virtual machines, build their own cloud platform, and carry out systematic practical teaching of computer knowledge such as C ++, database principles combined with cloud platform practice projects.

5.2 Teaching Mode Reform

The traditional computer teaching mode is mainly based on “case teaching”, and the teaching mode combined with cloud computing should adopt project driven teaching or collaborative teaching mode. These modes are difficult to realize in the traditional classroom case teaching mode. However, with the increase of computer resources and the change of teaching concept in Colleges and universities, the main contents of computer knowledge teaching in Colleges and universities can be left to the students to carry out on the network independently, and more time can be put in the computer practice teaching. Moreover, due to the particularity of cloud computing services, students can participate in the teaching practice of cloud computing remotely, so as to obtain better practical experience. In the cloud computing environment, practical teaching can not only provide the fairness of teaching, but also improve the initiative of students, improve the collaborative ability and innovation spirit of students, and lay a solid foundation for the future employment of students.

5.3 Examination Reform in the Cloud Age

In the background of the cloud era, the reform of teaching methods is not enough. Colleges and universities should also reform the assessment methods of students' computer practical ability, so as to correctly evaluate students' mastery of theoretical knowledge and practical ability, so that teachers' teaching has a more clear direction, and students can more clearly understand their own deficiencies in computer related knowledge and operation. In addition to the written examination of computer knowledge, the practical operation ability of students to the computer should also be investigated in combination with specific projects, such as the content of students' database design, the ability of students to build virtual machines, etc. At the same time, the assessment should also pay attention to the performance of students at ordinary times, and require students to complete practical projects seriously at ordinary times, and complete the learning content on time. In the arrangement of examination content, we should try to choose the classic items commonly used in enterprises as the examination content, so that students can initially have the ability to work in enterprises after passing the examination, and reduce the burden of students in the employment examination.

5.4 Hardware Resources of Cloud Laboratory

Due to the high requirements of practical teaching on experimental resources, it is very important to build a cloud laboratory and improve the cloud hardware resources of colleges and universities. Improving the cloud lab is not only conducive to the sharing of school teaching resources, but also conducive to the change of students' learning style. The main ways to improve the cloud lab are as follows:

The construction of the school cloud laboratory is based on the purpose of Internet sharing, openness and the requirements of serving the experimental needs of the school. When building a cloud laboratory, the school should first meet the scientific research needs of the school, provide powerful cloud computing scientific research services for the teachers of the school, then meet the needs of enterprises for talent training, provide students with full practical training opportunities, and finally meet the needs of students' learning and interest improvement, and reasonably arrange teachers or graduate students to guide students' computer practice And teaching to improve students' computer practice ability.

In this context, the University cloud laboratory should consider opening to the outside world, allowing enterprises to participate in and use the University cloud computing server for related business activities, and the maintenance of the server should also be partially handed over to students, so as to realize the extensive cooperation between the University and enterprises. On the one hand, the hardware resources of the laboratory should not be too backward, which can reduce the use experience of students and enterprises. On the other hand, the hardware resources of the laboratory should have enough space for upgrading and expansion. When the hardware resources are insufficient, it can meet the requirements of scientific research and learning through the expansion of hardware.

In the era of cloud computing, most colleges and universities have reduced the purchase demand for servers. Colleges and universities can rent corresponding cloud computing services from service providers when they need them, and do not need to worry about the maintenance of server hardware, so as to greatly reduce the operating cost of servers. The management of the server no longer needs to be carried out in the laboratory, only through the remote connection of the terminal with access rights, the function and settings of the cloud server can be adjusted, which not only reduces the maintenance energy consumption of the cloud service, but also improves the maintenance efficiency, and provides a greater contribution to the information technology teaching.

6. Conclusion

To sum up, this paper analyzes the actual situation of computer teaching in China, and puts forward its own views on the reform of computer teaching combined with cloud computing. In the era of cloud computing, the school needs to build a special cloud laboratory according to the actual situation to provide practical basis for the scientific research and talent training of the school. In the process of school teaching reform, we should integrate the teaching advantages of various subjects, combine the advantages of the cloud computing era, use new teaching concepts such as network teaching and project driven teaching mode to promote the actual teaching reform, so as to provide high-quality soil for the cultivation of computer talents in China.

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