Design and Implementation of University Network Education Platform Based on Cloud Computing

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Abstract. With the continuous progress of science and technology, the information society has also come. The emergence of cloud computing has made China's information platform more open, and at the same time, it has given unlimited opportunities for the development of all walks of life. The traditional single teaching mode in universities is no longer suitable for the development of modern students. In the internet plus era, universities built a network teaching platform to enrich students' learning methods. The use of the network teaching platform improved students' learning interest and stimulated students' learning potential. Cloud computing itself has obvious characteristics, which guarantees services under various measures. It is outstanding in scalability, virtualization and high versatility, and can be applied in different fields. People can get more educational resources through the network education platform of universities based on cloud computing, so as to make the education of universities exert greater value. Based on this, this paper mainly discusses the construction strategy of university network education platform based on cloud computing.

Keywords: Cloud computing, network education platform, Internet, teaching mode

1. Introduction
With the development of computer technology and network technology, most universities are using network resources to realize the sharing of educational resources [1]. Educational resources on the Internet are also very rich, such as teaching courseware, videos, teaching aids, books, etc., which have brought real help to the students of the school [2]. Cloud computing is the further development of distributed processing, parallel processing and grid computing, which makes data stored in the data terminal of the Internet, forms software and related services into shared resources in the Internet, and builds on various standards and protocols, and obtains related services through various hardware devices [3]. In the Internet plus era, the construction of network teaching platform in universities enriches the way students learn. The use of network teaching platform improves students' interest in learning and stimulates the students' learning potential [4]. Students can not be limited by time and space to use the network for learning, and teachers and students can also use the network teaching platform for communication, which plays a promoting role in improving the teaching effect [5]. Cloud
computing is also prominent in scalability, virtualization and high-throughput, and can be applied in different fields in the application process [6]. The emergence of cloud computing is of great significance for us to build an open, flexible and secure cloud education platform. College network cloud education platform is an education information platform that uses cloud computing technology to uniformly allocate and manage all education resources concentrated on one platform and provide them to users in the form of services [7]. The information data in the cloud education platform has the characteristics of security, sharing and synchronization, which can provide a new scheme and mode for the information construction of universities [8]. The network cloud education platform in universities can apply the services provided by cloud computing to all fields of higher education to assist the completion of teaching activities in universities, which is an extension of daily teaching activities [9]. China's universities use cloud computing technology to build some network education platforms, most of the information and data in the platform can be shared, and can also be uploaded synchronously according to the requirements of universities [10]. This is a new model for higher education, and also a progressive performance. With the popularization of the Internet, modern education based on computer networks has attracted more and more attention from educators and politicians. People can obtain more educational resources through the university online education platform based on cloud computing, so university education has greater value. Based on this, this article mainly discusses the strategy of building a university online education platform based on cloud computing.

2. Analysis of the advantages of cloud computing network teaching platform
Cloud computing university network education platform is a new education platform constructed under the influence of cloud computing technology, and its essence is to provide learners with a more perfect network learning environment and technical support. In the Internet environment, the purpose of cloud computing is to share computer hardware, storage devices, server clusters and other resources. Compared with full-time teaching methods such as undergraduate, junior college, adult and self-taught, online education in universities is less concerned by the society. Therefore, online education in universities is too limited in professional curriculum, and its source level is too single. Information database construction is the foundation of the construction of network teaching platform, as well as the foundation of realizing online testing and other functions, optimizing network resources and ensuring the advancement of network teaching platform [11].

Cloud education platform is a brand-new attempt in the field of education, which can effectively save the school's investment in education. The use of cloud education can enable teachers and students to acquire a brand-new educational concept. At the same time, cloud education platform can provide various resources to users through the cloud, breaking through the limitation of time and space, and making users more flexible in learning. The core elements and relationships of the model of co-creation and exchange of educational resources are shown in Figure 1.

![Fig.1 The core elements and relationships of the educational resource co-creation and sharing model](image-url)
College education network platform has many advantages under cloud computing. Firstly, it can effectively control the cost brought by hardware update. The requirement of cloud computing on terminal equipment is not very high. As long as there are networked computers, they can enter the cloud for a series of complex operations and applications. Cloud computing-based college network education platform should be able to discover and avoid network security problems in the information environment in time, and every device in the system should be able to use more efficient ways to prevent illegal intrusion activities and viruses in the network, so that the cloud platform is safer and more reliable in the running process. The original intention of online education should not be limited to these higher vocational colleges offering distance courses, but should be extended to the spontaneous learning platform of learners based on the network. With the advent of cloud computing, qiaqia can make up for the problems existing in online education in universities in China, and effectively integrate educational information resources.

Cloud computing plays an obvious role in collaborative work and resource sharing, and can meet the new needs of users. As long as users can access to the cloud, they can get the same working environment. After the integration of cloud resources, they can solve the problems of updating excellent courses and difficulty in compatibility. Cloud education platform can also narrow the distance between teachers and students, students can ask questions in the cloud at any time, and teachers can answer them, so that the quality of education can be significantly improved. The construction of cloud education platform is also a major innovation in China's education, which makes more breakthroughs in the educational concept of Chinese universities and abandons the deficiency of indoctrination teaching. Figure 2 is a path analysis model of university online classroom environment construction dimension and learning effect.

![Fig.2 Path analysis model](image)

3. Research on cloud computing network teaching system

3.1 Design of cloud computing network teaching system

The mature cloud platform providers to gradually host their business and deploy to the public cloud platform is a more important method, and the other is to integrate the network resources of universities in China. The function of network teaching platform design needs to be designed according to the actual needs of teaching, network teaching platform is a complete complement to teaching. The
modules of network teaching platform have common functions. Now, according to the needs of teaching reform, we need to add practical teaching modules, so that students can complete the corresponding experimental design on the network teaching platform. This plays an important role in improving students' practical skills and cultivating applied senior technical talents needed by enterprises. Cloud computing has a great reference for the construction of vocational education teachers, which can build teachers with rich knowledge and practical experience into a "cloud" of teachers [13]. The construction of "cloud" resources can strengthen the mobility of personnel among enterprises, universities and training institutions, realize the sharing of high-quality teacher resources, and promote the diversification of the composition of professional teachers. In terms of the construction of cloud platform for teacher resources, due to the relatively independent universities and training institutions in China, and the low mobility among teachers, the high-quality resources are only concentrated in local areas and have not yet achieved comprehensive development.

The interface design of the network teaching platform should be simple, convenient and flexible. In the process of learning on the online platform, teachers must follow up, guide students and answer questions online. This can increase students' interest in learning and improve their ability to learn independently. Figure 3 shows the measurement and functional structure of the intelligent information management system.

Cloud education platform virtualizes various resources and provides them to users through the cloud as services, which can be obtained at any time and on demand. It is real-time, reliable and flexible, and can provide various high-quality education services for teachers and students conveniently and quickly. When encountering difficulties in the learning process, students should be able to treat them with a correct attitude, and communicate with teachers and classmates in time to ensure that problems are solved as soon as possible. Therefore, it is very important to cultivate students' autonomous learning ability in online education. Compared with ordinary universities, distance education has many differences in teaching mode. Distance education makes full use of students' initiative and fully respects students' willingness to learn in different periods. By combining the ever-improving information technology with traditional education methods, it provides students with rich multimedia teaching resources and teaching activities in different forms, and assists with a variety of related learning support

![Fig.3 Measures and capability structure of the intelligent information management system](image_url)
services.

3.2 Structure design of cloud computing network teaching platform

The interactive, open and independent innovation of teacher resources under cloud computing can provide a good foundation for the all-round development of students. At the student level, the application of cloud computing technology can help students make their own learning plans and learning progress. Students need to learn how to learn, master certain learning methods and cultivate good interest in learning. Only in this way can they make a learning plan in line with their own situation, choose the learning content they need, and make more effective use of network education resources and related learning support services. If cloud computing technology is introduced into the field of network education, the characteristics and advantages of cloud computing, combined with the current university education resources, based on cloud computing network education platform, will achieve the purpose of eliminating the "information island". Good learning ability can enable learners to have the correct learning methods and skills, but also to ensure that learners successfully complete the learning tasks of each stage. Cloud education platform can not only provide students with a full range of channels to answer questions, but also further solve the problems of time, space and geographical restrictions faced by teachers and experts in answering questions.

With the support of multimedia technology, students can more easily extract their own knowledge content and control their learning progress more effectively. At the same time, it can also realize distance education, provide students with diversified learning resources and diversified teaching activities, give full play to students' subjective initiative, and facilitate students to solve learning problems. Figure 4 shows the kiosk architecture for the cloud service platform.

![Fig.4 Kiosk architecture](image)

The infrastructure of public cloud can be used by some larger organizations or units or organizations with the right to use public cloud, and the cloud services inside can also be sold by organizations or units with ownership. In the aspect of library resources, the application of cloud computing integrates the resources of the relatively independent and scattered network education platform into the cloud platform, thus realizing the resource management goal of turning the zero into the whole and facilitating the students' book access [14]. Cloud education platform is the application exploration of cloud computing in education field. According to the principles and characteristics of cloud computing, the capital investment of schools in infrastructure can be greatly reduced in the process of platform design and construction. The introduction of cloud education can change traditional teaching methods, teaching techniques, teacher training methods, students' learning, etc., and bring new teaching concepts to teachers and students. Cloud computing can further improve the efficiency of students' topic puzzle solving, so that students can immediately solve the puzzles and problems they face without teachers. The cloud education platform should fully consider the network security of the system in the running environment, and all the devices that make up the system should take effective measures to prevent illegal intrusion from the network and ensure the safe and reliable operation of the cloud platform.
4. Conclusions
In university education, the implementation of online education platforms plays an important role in improving the quality of education and the effectiveness of classroom education. The establishment of an online education platform supported by cloud computing is a new concept, which promotes the establishment of university digital campuses as an inevitable product in the educational information process. With the coming of information society, it is an inevitable way to use cloud education platform. Of course, using the cloud education platform is also an innovative development for the current college education. The cloud education platform can narrow the education gap, at the same time, it can make greater use of resources and bring the value of education into full play. Cloud education platform can not only solve the unfavorable factors in the development of education and narrow the educational gap, but also effectively improve work efficiency and rationally allocate educational resources, which is an inevitable outcome in the process of educational informationization. The design of the network teaching platform needs to be scientifically and reasonably designed according to the actual situation of the school. The selection of each module aims at improving students' comprehensive quality, comprehensively improving students' practical ability, and cultivating applied senior technical talents for the development of modern enterprises. In the future work, we will pay more attention to the effective combination of cloud education platform and digital campus, and provide effective reference for the improvement of platform functions and the feasibility of construction.

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