

# Research on Teaching Resource Platform Based on Cloud Computing ——Take PHP Programming as an Example

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## ABSTRACT

In the Internet + era, curriculum forms should be diversified. The teaching resource platform based on cloud computing can realize many functions such as teaching resource sharing, teaching interaction and enterprise participation. It is of positive significance to the theoretical research of curriculum reform, the improvement of teachers' professional level and the participation of enterprises in education and teaching.

**Keywords:** *Cloud computing, Teaching platform, PHP programming, Teaching.*

## 1. INTRODUCTION

With the advent of the "Internet +" era, the construction of national vocational education resource bank has been gradually accelerated. How to combine excellent network teaching resources with traditional classroom teaching is an important attempt of current vocational education reform. The combination of high-quality digital teaching resources and traditional teaching forms complementary advantages, thus improving teaching efficiency. With the enrichment of online learning resources, teaching activity gradually changed the way learners knowledge acquisition, due to the diversification of all kinds of teaching organization mode, the use of online learning technologies and platforms each are not identical, with the help of a professional education cloud platform high quality teaching resources, to integrate various flexible teaching methods of blended learning theory as the foundation, effective organization of the curriculum of PHP programming mixed teaching mode.

Construction of vocational education cloud platform to "PHP programming" course as an example, from the practice of hybrid teaching research, the reform of traditional multimedia teaching mode, with the help of Internet + green ecosystem to realize higher vocational education informationization, use advanced information technology, the structures, a new type of digital teaching environment, the use of different digital means to carry out the higher vocational teaching and innovation of

higher vocational teaching informationization. Practice in knowledge content, teaching design, teaching methods, teaching evaluation and other aspects. With the help of the "smart vocational Education cloud" platform, it organically combines online and offline learning and promotes the study of new teaching concepts and models for students' continuous learning and self-learning.

## 2. RESEARCH CONTENT

With the continuous advancement of education informatization, it is an important issue of national concern to narrow the digital gap in education, promote the sharing of high-quality education resources, and build a cloud service system of digital education resources covering the whole country. The Outline of the National Medium - and long-term Plan for Education Reform and Development (2011-2020) and the ten-year Development Plan for Education Informatization (2011-2020) emphasized: strengthening the development and application of high-quality educational resources. Strengthen the construction of network teaching resource base. The higher vocational teaching resource integration model based on cloud computing can provide safe and open technical support for resource construction and teaching resource system serving the society.

## **2.1. Project Research Purpose**

The cloud platform of higher vocational teaching resources based on cloud computing can realize the aggregation of massive information on the new technology platform, and provide the majority of teachers and students with an intelligent business and service platform, enabling real-time resource interconnection and interworking on campus whenever and wherever possible. It provides new ideas and methods for modern teaching and makes full use of the resources provided by network information technology. It creates a new generation of virtual campus and a new learning environment for learners, realizes real-time sharing of data from different regions, unifies and integrates the relatively independent and dispersed network system within colleges and universities, and makes rational use of school resources. Interactive teaching resources based on cloud computing model can be obtained in the PHP programming course better application, the two complement each other: the first cloud computing access needs the support of network technology, and the PHP program design course can provide high-speed access to technical support, secondly cloud computing interactive mode can be applied in broadband course, realize the cloud computing resources interaction model in the practice of professional course, promote the construction of informatization campus, provide wide development space for the teaching resource construction.

### ***2.1.1. The Interactive Mode of Teaching Resources in Cloud Computing Can Realize Resource Sharing and Establish Teaching Interaction***

Each university has its own advantageous disciplines and has excellent teaching resources. Each school applies its superior courses for college-level, provincial and even national quality courses. The same curriculum is repeated, resulting in a waste of resources. However, within colleges and universities, all kinds of resource databases are scattered and disconnected from each other, forming one after another "resource island", which is not conducive to information sharing, but also inevitably leads to similar or repeated construction of resources. Using cloud computing technology for information integration, the writers from various information resources open their interface, using the unified data standard for seamless access to the unity of the cloud computing platform, thus the discrete face-to-face teaching resources to build into a whole, thus eliminating "resource island", open to all users, form unified retrieval, play the biggest role of teaching resources. In the cloud computing environment, anyone can access to the cloud through thin terminals at any place and at any time to obtain the resources and services they need and interact with industry experts, scholars, teachers and students. The

use of cloud computing makes the generation of resources ubiquitous and ubiquitous. Users can easily access cloud resources as long as there is a network environment, which greatly improves the construction efficiency and use efficiency of resources, reflecting a new interactive mode.

### ***2.1.2. Relying on the Cloud Platform of Higher Vocational Teaching Resources, Vocational Skills as the Core, Vocational Skills Certification***

Higher vocational colleges train practical and skilled talents. The interaction model of teaching resources based on cloud computing takes standardizing professional teaching as the basic requirement to share high-quality teaching resources. According to the requirements of vocational positions, strengthen the training of employability, and build a professional certification system for the implementation of the "double certificate" system; Open teaching resources and environment can meet students' independent learning needs and build a lifelong learning system for the cultivation of high-skilled talents.

Building cloud computing teaching resources platform technology makes network teaching and learning methods flexible and convenient. Resources and application tools can be obtained from the "cloud" anytime and anywhere on demand. Students can browse resources and simulate practical training at any time through mobile phones, Pads, laptops and other terminal devices. Break the traditional client computer version, software installation requirements. The teaching resource platform of cloud mode enables teaching and learning to be no longer limited by time, place, hardware and software. It can provide a flexible way for students to study independently, choose their favorite subjects and obtain vocational qualification and skill certification. PHP Programming is one of the professional courses for Web front-end development engineers, aiming to train PHP programming engineers to achieve high-speed access to the network and meet the growing demand for broadband engineers in fiber-to-home projects. The PHP programming based on cloud computing resource interactive mode can realize the curriculum resource sharing, the PHP programming for students' autonomous learning provide a good platform for the theory and practice, to give students professional certification provides convenient technical services, promote social service ability and, in turn, provide technical support for cloud computing high-speed access.

## **2.2. The Significance of Project Research**

This project studies the positive role of cloud computing in the construction of higher vocational teaching resources, which can promote the rapid

development of higher vocational education informatization. The significance of this project is as follows:

### *2.2.1. The Interactive Model of Teaching Resources Based on Cloud Computing Supports New Interactive Applications of Resources*

At present, the resource database of many schools is still in the primary stage of resource storage, which mainly focuses on the storage of courseware, materials, online courses and reference materials, but does not allow users such as teachers and students to participate in the interactive application of knowledge and resources. Even if some resource construction involves interactive application, it is only the page access registration, courseware, video learning, exercise submission, but not the real meaning of the interactive, interactive effect is not high. Interactive teaching resources based on cloud computing model can provide users with new interactive mode, users can consider in the application of dynamic information, realize the teachers and experts, teachers and students, industry experts and students, between students and students mutual aid, the answers is not restricted by time, location, hardware and realize resources sharing and interaction.

To cloud model "PHP programming" course teaching resources interaction model not only provides users with the PHP program design of the courseware, video, teaching materials and other basic resources, also can integrate the similar colleges and universities "PHP programming" course of high quality resources, but also to provide users with the PHP programming training environment, good practice foundation for the students employment.

### *2.2.2. The Interactive Mode of Teaching Resources in Cloud Computing Can Strengthen the Energy Efficiency Management of Teaching Monitoring*

The level of a school's teaching management directly affects whether it can achieve the goal of talents and the quality of teaching. At present, it is difficult to guarantee the teaching quality due to the different teaching quality and teaching management mode in our schools. The application of "cloud computing" happens to solve this problem. "Cloud computing" to strengthen the monitoring management has a very important role in school teaching, can realize the competent department of education of the school teaching quality monitoring, promote the communication between different schools, enhance the level of school teaching, can also realize the school on the school curriculum implementation regulation, promote the academic communication between departments, provide students with the professional class.

### *2.2.3. The Teaching Resource Cloud Model Improves the Efficiency of Resource Allocation*

For higher vocational colleges, our investment in teaching and experiment and training occupies a large amount of expenditure, especially the investment in software and hardware of the training room. These software and hardware also need to be continuously updated and upgraded with the development of technology, which has virtually caused a huge waste. The network architecture of the Internet is evolving from "server + client" to "cloud service platform + client". Through "cloud computing" and "cloud service", the investment of software and hardware in the training room can be reduced by a large proportion, which can save a lot of money for the school.

## *2.3. Project Research Background*

Under the tide of the construction of teaching resource database across the country, the construction of teaching resources in vocational colleges presents such problems as "scattered construction in schools", "uneven quality" and "serious isolated phenomenon of resources". Although many colleges and universities have already built network infrastructure and information facilities, the sharing of information and resources is seriously restricted by the lack of clear goals, overall planning, regional differences, economic differences, technical specifications, information property rights and low utilization rate of network resources. At present, there are several problems in the construction of teaching resource platform in higher vocational colleges.

### *2.3.1. Uneven Distribution of Teaching Resources, Lack of Uniform Standards*

Regional differences and other reasons lead to the difference and unbalanced distribution of teaching resources in colleges and universities. The information construction of resources in higher vocational colleges is mostly self-built and self-used, lacking of overall planning and design and unified standard. The different specifications, parameters and models of software and hardware platforms purchased and constructed by various schools, as well as the different standards in the construction of teaching resources, restrict the sharing of resources among schools.

### *2.3.2. Resource Information Interaction Is Less, Utilization Rate Is Lower, and There Is No Unified Evaluation System*

In the construction of teaching resources, most higher vocational schools focus on quantity, give priority to the storage of resources, and give priority to teaching by

teachers. Fewer students interact with teachers, which affects students' interest in independent learning and the utilization rate of resources. In addition, there is no unified teaching resources and teaching evaluation system.

### *2.3.3. Low Degree of Integration of Teaching Resources, High Cost of Updating Teaching Resources and Slow Down.*

With the development of distance education, network education and the rise of cloud computing, as well as the expansion of curriculum joint scope between schools and between schools and enterprises, it becomes easier to integrate software resources. However, it is difficult to realize the integration of hardware resources. The updating of teaching resources involves the updating of hardware and software resources, knowledge copyright and other related contents, which need a lot of economic support. However, the funds of major universities are relatively tight, so they cannot update resources quickly.

### *2.3.4. The Maintenance of Teaching Resources Is Difficult and the Security Is Poor*

Most of the teaching resources in colleges and universities are mainly maintained by managerial personnel in various departments, but there are few professionals to maintain them. In addition, due to poor security, large-scale sharing cannot be realized. School for the maintenance of existing resources, such as computer course construction resource loss, the construction of informatization management level is not high, application effect is not good enough, the school in the aspect of system maintenance, information personnel training input is not ideal, backup, restore and disaster copy consciousness, lead to digital resources sharing and use of security and continuity of colleges and universities can't guarantee, information construction of the actual application effect is still lower than the school and the demand for information technology staff and students.

## **2.4. Project Research Process**

Through literature review and investigation in the early stage, the research is carried out from two aspects:

1) The interactive model of teaching resources based on cloud computing is established

Based on the distributed, highly integrated and economical characteristics of cloud computing technology, this paper attempts to build an interactive model of higher vocational teaching resources based on cloud computing. The interactive model consists of three parts: system standard, sharing mechanism and application pattern.

"System standard" refers to the "dual" resource system and "applied" resource standard based on the commonness and individuality of applied majors in higher vocational colleges. The "dual resource system" includes "common resources" and "individual resources": "Common resources" refer to the general teaching resource components required by applied disciplines and majors in higher vocational colleges, while "individual resources" refer to the characteristic teaching resources required by applied disciplines and majors in higher vocational colleges. The "application-oriented" resource standard refers to the basic standard of education resource technology and use for higher vocational education, which is formulated in consideration of the application-oriented characteristics of higher vocational education teaching and in combination with the "technical standard of education Information resource construction", so as to facilitate the sharing of resources.

"Sharing mechanism" includes three parts: resource co-construction mechanism, resource sharing mechanism and resource evaluation mechanism. It explores to build a co-construction and sharing mechanism including "public service" and "personalized service" that is guided by the government and participated by schools, enterprises and other forces. The system consists of a resource evaluation mechanism combining user online evaluation and expert review.

"Application mode" refers to the attempt to build a "multi-dimensional" cooperative learning teaching mode in higher vocational colleges based on the characteristics of "cooperative learning" supported by cloud computing technology. Through the cooperative learning platform, different colleges and universities can jointly formulate teaching norms, exchange teaching methods and complete common projects. At the same time, the "distance learning" feature supported by cloud technology is used to try to build a "school-enterprise collaboration" talent training model. Through the cloud technology resource platform, schools and enterprises can make professional training plans in real time and effectively, carry out virtual simulation practice, and jointly complete enterprise projects.

2) Explore the application of interactive mode of PHP programming teaching resources based on cloud computing

Based on high sharing, high reliability and low cost of cloud computing, this paper tries to build the application of interactive mode of teaching resources of PHP programming based on cloud computing. "PHP programming" teaching resources top-level frame design based on cloud model, open cloud architecture, interface technology and resources to "knowledge, skill and professional quality of the trinity" of open resources logical architecture, establish effective retrieval between resources, the formation of professional teaching content and organic link enterprise typical task, to build an open

repository, individualized teaching and learning platform and sharing learning communities such as the carrier, and career orientation navigation and task driven type agemet system, practical function, such as the original materials collection space built individual needs of different users to provide the digital instructional resource for learning and communicating.

This topic studies the interactive model of higher vocational teaching resource database. The focus of this research is to establish the interactive model of teaching resource based on cloud computing through this project, so as to realize the application of the interactive model of cloud computing in the course of PHP Programming. Establish the interactive model of PHP Programming course cloud computing, provide users with convenient access to PHP programming course resources and a new interactive cloud platform, realize diversified resource interaction, and promote the informatization of TEACHING resources of PHP Programming course in higher vocational colleges. The difficulty of the research is how to establish the interactive model of teaching resources based on cloud computing and realize the informationization of teaching resources in the interactive mode of cloud computing for PHP Programming. In the process of project implementation, is proposed to solve the key problem is how to make use of cloud computing technology, structures, low cost and highly efficient interactive model of teaching resources, and promote higher vocational colleges of the curriculum of PHP programming between high quality teaching resources sharing, to provide broadband engineer training public interactive cloud platform, become an urgent need to solve the problem.

Through the research of this topic, the innovation lies in the construction of innovative teaching resources. The interaction model of teaching resources based on cloud computing can integrate the characteristic and high quality information resources of domestic and foreign higher vocational colleges infinitely, and form a super-large digital resource base of disciplines, majors and courses, so as to effectively solve the problem of "inter-school imbalance" and repeated construction of information resources. Share "depth by using cloud computing technology", "low cost", "high reliability" service mode, set up higher vocational teaching resources broadband network course of interactive sharing cloud model, by providing support for terminal equipment, cross-platform, diversification, which can solve the PHP programming teaching resources scattered round "officer officer construction", "resource island" problem, which can promote higher vocational institute school "PHP programming" course in the high quality teaching resources sharing between, can let users anywhere at any time the implementation of the new interactive resources. Second, innovate the application of quality teaching resources. Cloud computing technology to ensure high availability and reliability of the digital resources

construction and resource service work well, at the same time, can take advantage of cloud computing service, provide virtual simulation study based on cloud teaching resources platform, personnel training and so on the many kinds of interactive mode between colleges, so as to reform the teaching process, improve the level of resources used. PHP Programming is a core course for front-end development engineers in We. The interactive model of PHP Programming teaching resources based on cloud computing enables users to realize the actual operation of mainstream manufacturers' access devices, provide users with ubiquitous access to resources, and realize the interaction with experts, scholars, teachers and students at any time, thus innovating the application of PHP Programming teaching resources.

This research hopes to achieve the expected goal is to break through the bottleneck of professional construction resource sharing in higher vocational colleges and meet the vocational learning needs of all kinds of users. With "major groups, majors, courses, resources" and "education management institutions, major groups, schools, teachers" as the main line, to create a cloud-based teaching resource interaction model that can be Shared, Shared and built by vocational colleges, enterprises, and the society; The interactive cloud model of PHP Programming, a teaching resource for higher vocational education, can satisfy the independent learning of teachers and students, employees and social learners. The teaching resource interaction mode of PHP Programming based on cloud computing can provide guidance for various vocational colleges, enterprises and social learners in China in teaching resource retrieval, information query, data download, teaching guidance, learning consultation, personnel training, online learning, expert comment, simulation operation and other services.

### 3. CONCLUSION

Vocational education hybrid teaching mode reform will be aimed at the characteristics of the students in vocational colleges to business and the depth of information fusion, the national vocational education resource database of digital resources and the organic combination of classroom teaching quality, and inspire higher vocational students' subjective initiative, to promote college students' all-round development become a inter-disciplinary talent is of great significance. Based on the empirical research results of the mixed teaching model, it can be seen that most students are interested in this online and offline learning mode, and the platform honor points give students the motivation to continue learning. In addition, according to the various obstacles encountered in teaching, from the macro perspective of schools, it is necessary to upgrade modern vocational education curriculum to vocational education talent cultivation strategy. From the perspective of practice, it is necessary to improve the teachers' information literacy,

and the student-oriented activity design should be improved continuously. In terms of teaching management, students' active scheduling strategy is optimized and the collaborative working mechanism is improved, so that both teaching and learning activities benefit from the use of the vocational education cloud platform.

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### **REFERENCES**

- [1] Zhang jiagui, Research on the Construction of Shared Professional Teaching Resource database in higher vocational Colleges [J].Modern educational technology.2010.7.
- [2] Wang ying,Innovation and Practice of intelligent "Cloud classroom" information teaching design in Higher vocational Colleges.Vocational & Technical Education Forum,2017(27).
- [3] Zhang junxiang,.Research on the Construction of Digital Education Resources in Colleges and Universities based on education cloud[J],Journal of Hubei Normal University(Natural Science edition),2014(34).
- [4] Ye liangyan,Research on the construction of higher vocational teaching resource sharing Platform based on cloud Computing Model[J],Information and Computers (Theoretical),2014(4).