Design and Implementation of Web-based Teacher Remote Training Platform

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Abstract. With the development of computer and network technology, teachers' continuing education has also developed from traditional training to social networked training. The large-scale, open and online education in online training has transformed teacher training activities from a single form to a complex one. Higher requirements have been put forward on the construction of network training platforms and the setting and design of courses. According to the current status and development trend of computer technology, the development of research platforms is mainly based on the open technology and high integration, and the most advanced and mature mainstream technologies and products based on high-level application development. Under the premise of high security and reliability, the research platform is easy to use, maintainable and scalable. The purpose of this article is to design and implement a web-based teacher distance learning platform. This article uses .NET technology as the site development technology to develop the website, and uses Oracle9i database and object web dynamic web technology to build the database, and builds three modules of system management, teacher management, and student training. Experiments were conducted on a certain school through the establishment of a platform and the setting of school curriculums. After learning through the training, it was found that after participating in the training, students were satisfied with "the students are satisfied with the network training process", "whether the training content meets the needs of the students", "network training platform" Satisfaction of resources "and" Whether the process of activities in the training process are satisfactory "are all above 88%.

Keywords: Social Networking, Teacher Management, Network Technology, Network Training
1. Introduction

In the information age, how to obtain professional development through network technology is a question we need to consider. With the advantages of economy, openness, autonomy and convenience, network-based remote training has gradually become an important means for teachers' continuing education in China. In recent years, the rapid application and promotion of Web technology in the network world, the global network interconnection concept and application model are experiencing the changes of network socialization, application personalization, and content miniaturization. In this era, China's distance education community has gradually transitioned from initially focusing on the Web's technologies, concepts, and concepts to focusing on exploring and researching the practical application of the Web in the field of education, especially in remote training and distance training platforms that promote professional development of teachers. In the construction, we have begun to try the application of Web technology. At present, although great progress has been made in promoting the educational technology ability of teachers in China's primary and secondary schools, there are still many difficulties and challenges: the arrival of a new teaching model has made traditional teaching concepts unacceptable, so it will take some time to run in. This requires teachers to adapt to this network training mode. At the same time, the quality of online training cannot be guaranteed, mainly because the content of the resource library is not rich enough and needs to be updated to meet the needs of learners.

The vigorous development of online training lies in its advanced technology and learning resources: one is the sharing of resource libraries. During the online training process, learners can obtain the learning resources they want anytime, anywhere. Expert teachers and learners can leave messages. Barrier-free communication, learners can also explore each other and collaborate with each other [1]. The other is that the network training method is convenient. When the learner is performing network training, as long as there is a network, he can choose a learning tool to learn at any time. This also reflects the initiative and enthusiasm of the learner. If you have any questions, you can leave a message online to the teacher, and the teacher can reply on the Internet. Usually, there is a double-line parallel between the teacher and the student[2].

Online training is a different learning mode compared to traditional teaching. This difference is reflected in the role of learners. Learners participating in the training are not only students but also teachers with rich educational experience. Another difference is mainly reflected in the setting of teaching resources for network training. This includes not only some combed theoretical knowledge, but also the experience of many experts and teachers. From these aspects, it can be seen that network training is not only interactive and practical, but also has some characteristics. These characteristics are developed from the characteristics of teacher professional development.

This article uses .NET technology as the site development technology to develop the website, and uses Oracle9i database and object web dynamic web technology to build the database, and builds three modules of system management, teacher management, and student training. Experiment with a school by setting up a platform and setting up a school curriculum, and form a team of experts, develop curriculum resources, provide a training platform, conduct a comprehensive survey and draw results.

2. Method
2.1 Platform Architecture

.NET technology as a new generation of website development technology. The platform has strong cross-platform interoperability, scalability and security, and adopts a BS-mode network architecture [3-4]. The structure is divided into three layers: presentation layer, business layer and data layer. The advantage is that the presentation layer is separated from the business processing layer and the data communication layer. When adding a new access channel, just add the channel driver and change the content display format without modifying transactions, data communication and processing in the background. The separation of the business layer and the data communication layer can be connected to different backends without having to make many changes in business processing [5]. Therefore, the layered design makes the platform more flexible and easier to maintain.

2.2 Platform Database Design

The platform uses Oracle9i database and Web dynamic web technology, and uses practical naming rules to build and maintain databases, including tables, views, data warehouses, etc. [6]. Each field is given a corresponding data type and constraints to ensure data standardization and uniformity [7]. Primary key constraints are used in data table design. These tables are connected by the primary key, which is beneficial to the maintenance and operation of the database, reduces redundancy, and improves the operating efficiency of the system [8]. Through the concurrent operation of multiple database servers, the client server sends an HTTP request to the server through a web browser, processes the business of the application system through middleware, and then sends the execution request to the database server to communicate with the database server. Database server. Database, while the client only deals with the display of the interface [9-10]. This solves the problems of asynchronous data access and database access efficiency from two aspects: physical architecture and entity database design.

2.3 Functional Module Design of the Platform

According to the module division of the platform, the platform is generally divided into a system management module, a teacher management module and a student training module. The main process is as follows: User login authentication distinguishes the authority and enters the corresponding authority operation module user exit.

   (1) System management module: The system management module mainly maintains the entire platform, with functions of adding, deleting, modifying administrators, adding, deleting, and querying teachers and students, publishing system announcements, news, dynamics, and other functions, tracking, comprehensive statistics, and query Research workload of teachers and students [11].

   (2) Teacher management module: The main function of the teacher management module is to submit and upload project introductions, training plans, assessment requirements and schedules; class users are open: guide the submission of teacher teams and expert teams; edit training course introductions, questionnaire surveys, Set discussion questions, urge students to complete research tasks on time, answer student questions and approve completion assessments [12].

   (3) Student training module: The student training module is mainly through browsing information, watching videos, completing assignments, participating in seminars, forums, sharing learning
resources, participating in questionnaires, asking questions, publishing articles, and sending and receiving internal emails based on internal emails. Requirements and skills for online courses.

3. Experiment

The core idea of online training is to improve the effectiveness and diversity of learning activities. When the learners actively participate in the training process to achieve satisfactory learning results, they can structure the training process and form a sequence of learning activities to promote more effective learning. Learning, through the preservation of the design of network training activities, the design of learning activities can be shared and reused in the future.

3.1 Training Objectives

Relying on the teacher network training community, the combination of network and school-based training is implemented to innovate the network training mode of teachers, establish the normal operation mechanism of school-based training, consolidate the foundation of school-based training for all teachers, and promote the professional development of teachers.

3.2 Training Content

Training courses include general courses and subject courses. According to the requirements of the basic education curriculum reform, the revised curriculum standards and the needs of education and teaching in 2018, the training content includes the following three aspects. The first part: professional concepts and ethics. Part II: Expertise. Part III: Professional competence.

3.3 Guidance for Students

(1) Establish a student team

Establish a student assistance team composed of national training experts and provincial experts with rich network and school-based training experience, and through backbone training, do a good job of student communication and break-in work, and form a working expert guidance team to do well together Students assist in work.

(2) Diverse education channels

Learning is dialogue. The assistant team will lead and promote dialogue through curriculum resources, assessment assignments, editing briefings, answering questions, and following up reviews: organizing online seminars.

4. Discussion

4.1 Organizational Safeguards

Arrange the whole job. All provinces and counties should conduct local research before starting network research. The school is the main body of the school-based research organization, and the principal is the first person in charge. It is necessary to formulate a research plan, improve the project organization system, establish an organization management system, improve the assessment and
evaluation mechanism, and ensure that the daily research work of all teachers is carried out. We should arrange funds in the school's public funds to support research.

The municipal and county education administrative departments are responsible for the organization and management of regional training, and formulate project planning plans. Arrange special funds to support research. Do a good job in the selection of project schools and training teams, and provide centralized training for school trainers. Work with training institutions to manage local “teacher seminars”. Work with training institutions to do a good job in process monitoring and performance evaluation of project schools. The learning of training teachers at all levels shall be included in the assessment of teachers and recorded in the training credits. The provincial education administrative department is responsible for organizing and managing provincial training, selecting project districts and counties, formulating project plans, incorporating national training projects into provincial plans, and providing special funding support for project implementation. Work with the training institution to do a good job of monitoring and evaluating the performance of the project.

4.2 Teaching Guarantee

Training institutions should establish a team of experts, develop curriculum resources, and provide training platforms to provide professional support and services for network and school-based training in various regions. Responsible for the centralized training of county-level trainers and carry out teaching activities during the training. Cooperate with local education administration departments to do a good job of project organization and management, student management and evaluation.

4.3 Resource Guarantee

(1) The training institution should set up abundant and applicable course resources in advance, including compulsory courses and elective courses. Compulsory courses should focus on common needs and address key and difficult issues. Some compulsory courses must be structured in a MOOCS manner and decentralized. In principle, each course must not exceed 15 minutes, and the student's learning process should be monitored through real-time problem assessment and peer assessment. In principle, such resources must be no less than a quarter of the online classroom time. Elective courses should focus on cutting-edge issues, core issues and key issues in classroom teaching, and effectively integrate typical cases. In principle, such resources should not be less than twice the amount of online classroom time.

(2) Districts and counties should work with training institutions to establish local curriculum resource banks, collect high-quality resources from school-based training, and focus on building typical and micro-curricular courses. County-level subject trainers should focus on examining and approving the generated resources of each school, and use "teacher workshops" to organize their own subject teachers to study. With the support of training institutions, county-level subject trainers are encouraged to design action research themes and conduct cross-school collaborative research activities around the development of local high-quality resources.

(3) The school should integrate and generate resources in the course of school-based research such as teaching research, classroom records, mini-courses, and establish a school-based resource library. Representative research results should be recommended to district and county resource banks. The
district / county education administrative department shall work with the training institution to formulate the quantity and quality requirements of the recommended resources of the school, and establish a high-quality resource incentive mechanism.

4.4 Effect Evaluation Analysis

After the training, the satisfaction survey of trainees after the training was designed based on the actual situation of the online training. The questionnaire was developed based on the perspective of the participating teachers. The question was whether the trainees were satisfied with the online training process and whether the training content met the trainees 'needs The four aspects, "Is the network training platform resource satisfactory", and "Are the activities in the training process satisfactory?" Are summarized. The satisfaction is shown in Table 1 below, and the satisfaction is above 88%. The overall evaluation of the training is satisfactory. Higher.

| survey content                                      | Very satisfied | Satisfied | Average | Dissatisfied |
|-----------------------------------------------------|----------------|-----------|---------|--------------|
| Whether the students are satisfied with the network training process | 46.32%         | 48.95%    | 4.06%   | 0.67%        |
| Whether the training content meets the needs of students | 53.28%         | 37.63%    | 8.94%   | 0.15%        |
| Whether the network training platform resources are satisfactory | 48.62%         | 43.37%    | 7.18%   | 0.83%        |
| Whether the activity process is satisfactory during the training | 63.21%         | 29.33%    | 6.47%   | 0.99%        |

Table 1. Student satisfaction with online training

Achievements in training (Unit: percentage)
Figure 1. Results of training

5. Conclusion

The characteristics of the online learning platform determine that its learners have differences in both knowledge and experience. In short, the concept of "universal design" should be borrowed in the design of online courses, emphasizing that the design of the course should benefit every learner. Adhering to the concept that everyone can learn fairly, we provide multiple and flexible learning spaces according to the differences of learners, so that learners can have effective learning and good interaction in their learning activities. This article uses .NET technology as the site development technology to develop the website, and uses Oracle9i database and Object Web dynamic webpage technology to build the database, and builds three modules of system management, teacher management, and student training. Experiments were conducted on a school by constructing a platform and setting the school curriculum, and found that after the training and study, the trainees' satisfaction was over 88% after participating in the training.

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