Studies on Network Teaching and Website Design of Main Courses

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ABSTRACT

With the rapid development of Internet technology, especially the extensive establishment of campus network, the digital learning of a certain course based on information technology is of great significance to the teaching of the new era. Taking the quality course construction of electrodynamics of Shandong Province as an example, we discuss the course website design ideas, experience and techniques, which may have some reference values for the similar main courses of science and engineering.

1 INTRODUCTION

Since 1980s, the information technology represented by computer, multimedia and digital transmission has rapidly developed in China and greatly changed the mode of production, work, living and learning in human society. The application of network and multimedia technology in the field of education has caused profound changes in education concept, mode, teaching methods and teaching means. Hence the so-called “digital learning” or “E-Learning” appears, i.e., learning based on network [1].

With the wide establishment of the campus network, the construction of learning resources based on Internet is of great significance to the teaching in the new period, for it is suitable for contemporary students' cognitive characteristics. Especially, the resource-based thematic learning site carries out more extensive and in-depth research on a wide range of knowledge topics for a certain professional course in the Internet environment. It provides a wide space for people to share resources, make multiple interactions and independent learning, which fully embodies the advantages of the integration of information technology and curriculum.

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Overall, in recent years the network education of China is in rapid development stage, and new forms of online education like Mooc (Massive Open Online Courses) emerge in endlessly, so that the construction and application of network teaching and curriculum website are facing the reforms and challenges of technology, concept and design methods. At the same time, there are still many unsatisfactory cases like the phenomenon of “more construction and less practical use”, and the main reason is that the concept of construction ideas of learning websites are unreasonable and not practical, which will impede the developments of network education with no doubt. In addition, the techniques of education website related to science and engineering are weak, especially the practical functions connected with practical teaching. So the potential of the network education remains to be further developed [2]. In this paper, Based on the quality course construction of electrodynamics of Shandong Province, we discuss the course website design ideas, experience and techniques, which may have certain reference value for the main courses of science and engineering.

2 CHARACTERISTICS AND ADVANTAGES OF NETWORK TEACHING

2.1 Characteristics of Network Teaching Mode

Network teaching is an important form of distance education, which uses computer to access local and worldwide digital resources, and achieves extensive exchanges and cooperation between teachers and students or students and students. Its main characteristic is to change the traditional classroom teaching from the teacher's teaching as the center to the student's learning as the center. This will make the teaching process to be teacher-directed and student-centered, promote the internal role of students and encourage them to change from passive acceptance to active acquisition of knowledge. Another important characteristic is diversity, for of network education information resources are distributed all over the world. Through offices, libraries and even home online, teachers and students can quickly get the latest and comprehensive first-hand information, and listen to the world first-class teachers' lectures or the best expert advice. Network education has broken the space-time restrictions in the traditional teaching, and it can be one of the most important educational means for now and even future.

2.2 Advantages in Online Teaching

The application of modern information technology in education process can advantageously realize all kinds of teaching methods, such as cooperative discussion method, discovery method, simulation method, situational method and autonomous learning. The expression modes of Network teaching can be diversified. Through simulation, virtual and other technical means it can express the fact and experience the same as real situations, or the ones which can not expressed on realistic conditions, so as to develop the creative thinking and cultivate the innovation ability for students. The traditional classroom teaching is a collective teaching, so it is difficult to distinguish the personality and characteristics of students and students are often in a passive learning environment. Network teaching is an organic combination of collectivization and individualization. Through the network, students can freely participate in various discussion groups for interested issues, and play their own characteristics to debate, help or collaborate. In addition, the diversity of the network environment provides a
A wide range of development for personalized teaching, e.g., the both sides of teachers and students can teach and learn according to their own needs.

3 MAIN PROBLEMS IN CURRENT NETWORK TEACHING OF CHINA

In some documents issued by the Ministry of Education of China, it is also called modern distance education as network education [3]. In the actual teaching practice, this form of online education does provide students with a variety of convenience. Network education in China is now in the stage of development and has great potential to be explored. However, it is also faced with the challenges in concepts, design methods, techniques and other aspects. There exist some main problems as follows: 1) Review of internet learning resources construction and application in recent years, there has been a phenomenon of “more construction and less practical use”, and its main reason is the unreasonable and not practical concepts of construction. 2) In terms of technology, the website design techniques are not perfect, and there is still a big gap compared with the more mature commercial websites. 3) The rapid expansion of internet education in recent years has also brought about management problems. Excessive expansion scale of modern distance education inevitably leads to lower quality of practical effects. Only emphasizing economic benefits and ignoring social benefits will affect the further development of network education negatively.

4 IDEAS AND STRATEGIES OF MAIN COURSES NETWORK PLATFORM DESIGN

For highly professional main courses of science and engineering, such as electrodynamics in Physics, the design of network learning platform has its own set of principles, which are different from commercial websites and comprehensive education websites. In the following, we will summarize and discuss the experience in the process of designing the network teaching platform of Shandong province quality course of electrodynamics. It may provide some inspiration and reference for the similar course.

4.1 Design Concepts

Online learning platform for a professional course like electrodynamics generally not faces for the public, but has a specific audience with strong pertinence. The content of the platform should be based on the systematic knowledge of special topic in the course, collect and synthesize the knowledge points of the various disciplines related to the topic, so its information exceeds the single subject's content in the breadth and depth. It can reestablish and integrate the knowledge modules conforming to the laws and characteristics of students' Cognition [4]. The network learning platform should also meet the needs of teachers and students in different levels and disciplines, and provide abundant resources so that teachers and students can collect and retrieve information. This kind of platform is for collaborative learning and beneficial for teachers and students to learn from each other.
4.2 Design Strategies

The web-based learning platform is also a resource-learning site that focuses on one or more of the topics that are closely related to a certain course. It can be used to store, transfer and process teaching information, but also allow self-study and communication for students, then help them to know their own learning situation. Therefore, the following strategies should be paid attention to in the design. A topic selected is not equivalent to a single point of knowledge or a curriculum. It is a scientific logic system which is made up of a series of knowledge points with organic integration and reflects the constructivism learning theory. The topics selected are best small, exquisite and easy to do in-depth research. They should avoid being too large and vague. The topics should be extensible too, follow the trend of the times and constantly update. The specific content of the topic can be expressed by the diversified forms of cyber sources, such as text, image, animation, video, audio, multimedia courseware, network communication tools and other material resources [5].

4.3 Some Related Design Techniques

The learning platform for professional courses should select information resources reasonably according to learners' characteristics. Besides, it can provide instant functions such as online communication and self-evaluation. In the realization of the above functions, there generally exist two technical issues. One is the play PPT courseware online. There is a convenient way to achieve the function by the .mht file. When you choose to save PPT as the web page type, you can see this item. The .mht is a WEB e-mail file that can be opened and played with a browser, provided that the computer is equipped with OUTLOOK EXPRESS. On the other hand, when the real-time interactive functions are provided, the learning platform of science and engineering courses will inevitably encounter the online formula entry, which has been a difficult problem for long. It is recommended to use WebEQ for online formula input and display [6]. WebEQ is a MathML-aware java application and MathML is a standard for web math symbols that can be used to create mathematical equations on a web page and publish it on a Web Server. One can learn relevant detailed information on the official website of Design Science Ltd. Co.

5 CONCLUSIONS

The combination of internet and teaching has become the educational trend in China overall. Using a friendly network platform with scientific and reasonable design to assist teaching, can enhance the interactions between teachers and students, promote students' interests in learning, and then increase their scope of knowledge. Teachers can manage the teaching conveniently through network, acquire the feedback information of students in time, then teach or adjust with pertinence. Network teaching can help teachers and students to learn whenever and wherever. Therefore, the scientific and reasonable development of network teaching will greatly meet the learning aspirations of students in the new era.

This article is supported by the following funds: Quality Course Construction of Colleges and Universities in Shandong Province (JPKC201311), Quality Course
Construction of Shandong Province Graduate Education (1907319), and Key Educational Research Project of University of Jinan (JZ1229).

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