The Practice in the Web-Based Teaching and Learning for Three Years

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Abstract

The WWW has created major innovation in the way knowledge is transferred. Since 1998, we have offered Web-based multimedia technology course for on-campus and off-campus graduates in our country. In this paper, we describe the teaching and learning system we have developed, the model for teaching and learning, and report the results of it in the past three years.

1. Introduction

The rapid growth of the Internet is leading many educators to experiment with distance learning [3][4][5][6]. Colleges and universities are rapidly moving courses and even entire degree programs onto the Internet at a staggering rate [2]. This paper reports our first-hand experience in the Web-based teaching and learning for three years, including Web-based course named Multimedia Fundamentals and Applications, the teaching and learning system, which were developed only for our courses, the model for teaching and learning, and the results of Web-based teaching and learning.

2. The teaching and learning system

In the teaching and learning system, both teachers and students use Web browsers as the interface for reading and writing, and to simply publish or download the materials that supplement existing courses. Both teachers and students can work at home or office via the Internet.

During the developing, we have paid a great attention for the interaction between teachers and students. The interaction is non-real time and also text-based. We also encourage students to communicate student-to-teacher and student-to-student by telephone, for it is a real time interaction in speech. A powerful editor like Microsoft Word Processor and a simple email program are embedded in the system, which students have enjoyed very much.

3. The course materials

The content of the course is consisted of 4 parts, which are media (speech, audio, image, and video) computing, Web Programming Languages, such as HTML (Hypertext Makeup Language), XML (Extensible Markup Language), JavaScript and VBScripts, storage for multimedia and multimedia networking. Besides, there are supplementary articles and papers related to state-of-the-art technologies. These course materials are mainly text-based and organized in non-linear fashion, learners can conveniently use them. Since the speed of network is very slow and the fee paid for using the Internet is high in China, we have not used audio/video stream for delivering the course during the past three years. Meanwhile, our students strongly ask me to publish traditional textbook.

4. The model for teaching and learning

There is no doubt that nothing will replace synchronous learning through face-to-face interaction, but it is sometimes not feasible for students to attend conventional classes due to distance or time constraints [1]. That is why we use the hybrid model of face-to-face plus distance learning.

We arrange face-to-face discussion for three or four times in a semester. At the first time, teacher introduce students how to teach and study the Web-based course, in the second and third sections, teacher instruct students again and answer the question occurred in their study. In the end, there is exam for students in classroom, since there is no good means to prevent cheating until now. The teaching and learning through face-to-face is arranged in
campus for on-campus students, and delivered to off-campus students through a satellite, the Internet or CD-ROM.

Students learn the course materials under teacher’s guidance, put their questions to our Web site (http://166.111.68.180/). We strongly encourage students to answer their questions by themselves, and to use search engine, such as Google (http://www.google.com), for discovering answers and new technology.

In fall 2000, we had assigned two tasks, from which students could select one. One is to understand wavelet and write a overview on its applications, another is to understand text to speech for mandarin and write a paper how to improve the naturalness of output synthesized speech. Many students were very active to find the materials via the Internet, put their opinions and what they found to our Web site, and wrote their papers.

5. The facts and experience

Since 1998, we have offered the Web-based degree course, Multimedia Fundamentals and Applications, for conventional on-campus students and off-campus students. The off-campus students are distributed in our country whose circumstances require that they be asynchronous in time or space. It is the first Web-based course for graduate students in our university. Since then, a total of 1463 students have attended this course.

In the end of fall 2000, we arranged the exam for these students. Since all of examination questions are the same, it is very convenient to compare between the on-campus and off-campus students.

There are one third of off-campus students who selected the course only for updating their knowledge, and they did not take part in the exam. The others are pursuing for master degree.

The average of on-campus score is higher than the average of off-campus score. There are mainly two reasons for explaining the result. One is that on-campus students were selected from many students by exam, and off-campus students were not. The other is that most off-campus students have to work during the daytime.

6. Conclusion

The course, Multimedia Fundamentals and Applications, is the first formal Web-based course offered in Tsinghua University, maybe the first one in China. Since 1998, we have noticed, several courses in our university have been following the teaching and learning model, that is face-to-face plus distance learning via the Internet, text-based web pages, and developing the almost same teaching and learning system as we have done. It is true that this kind of Web-based course is more suitable for the situation of our country, most Chinese are unable to get high education and the network environment is very poor. However, the situation in China is rapidly changing today, what we are doing is to get the help of companies for developing the teaching and learning system with audio/video streaming technology, and let the teacher concentrate on developing course contents.

7. References


