A Teaching Case for a Distance Learning Course:
Teaching Digital Image Processing

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EXECUTIVE SUMMARY

Tsinghua University in Beijing, China reported a teaching case related to the experience of conducting a distance-learning course entitled “Digital Image Processing.” The course is at the graduate level for students of continuing education who are separately located in more than 60 cities around the country. This course was conducted twice with an interval of 2 years (in academic years 2000-2001 and 2002-2003). A number of tasks for improvements were performed based on the lesson learned from the first round, and their effects were justified by the second round. The organization background is described. Information about the course setting and related tools for the course conduction are provided. The outputs and evaluation of the experience are also presented. From this experimental based case, some helpful insights for the utilization and management of modern educational concepts and information technology in distance learning would be obtained. They include: more studies on the special requirements of distance learning should be continued; more concerns on the particularity of working students should be taken into the course designing and conduction; as well as more advantages of the progress of network technology should be followed.

Keywords: computer-based instruction; course Web site; data processing; distance education courses; information and communication technologies; learning communities; Web course development

ORGANIZATION BACKGROUND

The case was occurred in Tsinghua University, Beijing, China. The campus of Tsinghua University is situated on several former royal gardens of the Qing Dynasty, surrounded by a few historical sites in northwest Beijing, China. The university was established in 1911. Currently, the university consists of 13 schools and 54 departments and has over 7,700 faculty and staff members, with over 1,300 full professors and 1,800 associate professors. There are currently more than 25,000 regular students (including 13,700 undergraduates, 7,000 master’s degrees candidates, and 5,000 doctoral candidates) on campus to follow more than 100 programs in both undergraduate levels and graduate levels (http://www.tsinghua.edu.cn/).

The course reported in this case is conducted in the School of Continuing Education of Tsinghua University. This school was established in 1985 (the first official school for such a
purpose in China). It takes as its long-term and important tasks the cultivation and improvement of personnel on the job in the whole country. Thus, the continuing education and higher education for in-service adults have become an integrated component-part of the higher education system at Tsinghua University since then. Currently, more than 10,000 students are enrolled in several dozens of programs of the School of Continuing Education, which makes this school the biggest school of the university both in numbers of programs and students. Presently, the dean of the school is also the vice president of university.

The evolution of the distance-learning segment has been kept rapidly in China. Though this school is a relative recent one compared to other schools in university, it has a faster rate of development and soon becomes the largest school in university. It has near 20 centers for different disciplines (covering public management, industrial management, engineering management, hygiene, advertisement, culture art, cars, agriculture, real estate, culture art, etc.) and there are already 1,435 staff and adjunct professors (http://www.sce.tsinghua.edu.cn/). Adjunct professors belong to different academic departments of the university and they are responsible for instructions and course conduction. Staff are mainly responsible for different administration and management tasks, as well as technical supporting. Not only are some programs of diploma provided, the School of Continuing Education of Tsinghua University also offers many possibilities of training education in various disciplines.

With the rapid progresses of computer and communication technology as well as fast evolution of novel professions, continuous education, and distance learning become the must and their deployments are always on the rise. Recently, the number of students who follow the continuing education programs, especially at the graduate level, increase very quickly. More than 10,000 students (around the country) pursue their Master’s degree programs through distance learning. They have made registration in the School of Continuing Education and followed the lectures and courses in the learning stations located near to their working places. More than 1,700 students have been involved in the present case. They are unevenly distributed in more than 60 learning stations.

All these students are working persons, and most of them are working in company, factory, army, or government offices. As they are working around the country, such a specific characteristic makes it so they can only be involved in distance learning of an online course. From a demographic point of view, most of them are aged 27-30 (there are several students over the age of 40). Most of them have 5 or more years of working experience; few of them even have more than 10 years of working experience. Almost all of them have already obtained their Bachelor or Engineering diplomas after following a study program of 4 years in university. Though a large part of students have an engineering background with variations from electronic engineering, electrical engineering, automation and control engineering, biomedical engineering, computer technique to optical engineering, chemical engineering, mechanical engineering, material engineering, precision instrument, and so forth, around one fifth of them graduated from disciplines such as management, public policy, mathematics, physics, literature, and language. It is the new challenge (they meet in their employments) that takes them back to the study of computer technology, and in particular, image technology.

**SETTING THE STAGE**

The case related to a distance-learning course. Distance learning would be a powerful tool toward making a new paradigm where students and instructors make fewer trips to campuses to receive or deliver lectures (Shih, 2003). In education by distance learning, an integration of information technologies, computer hardware systems, and communication tools is applied to support educational professionals in remote teaching (Tiffin, 2002).