Adopting Distance Learning in Graphic Communications Curricula

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Abstract

Change can be seen everywhere. Printing and graphic communication educators are busy infusing digital imaging technologies into their curricula. At the same time, teaching methods are also changing at a rapid pace. Through the use of the Internet and instructional media technologies, it is now possible to teach students at any location and at any time.

Distance learning is often referred to as on-line instruction. The author’s adventures in adopting distance learning are described in this paper. It has been written for printing faculty who are interested in adopting distance learning techniques. It explains what makes on-line instruction so appealing. The author also discusses the distance learning program used by the college in which he teaches, and his personal experiences in preparing for and teaching two courses in the distance learning format. Surveys of students’ opinions regarding their learning experiences, and the author’s personal assessment are also discussed.

Introduction

The author has been a faculty member in the Rochester Institute of Technology’s (RIT) School of Printing Management and Sciences since 1980 and has taught digital imaging in printing and publishing. His involvement in distance learning began in the spring of 1997 when Xerox Corporation commissioned RIT to develop a series of distance learning courses in digital imaging and publishing technologies for its employees in multiple locations throughout the United States.

Issues and Concerns

From the initial stage of the project, the author faced a number of issues that were important in the development of distance learning courses. The issues included shifts in the demographics of students, the role of faculty and administration in offering distance learning education, and technologies for on-line education.

Shift in Demographics

The first issue was a shift in demographics. There has been a significant reduction in the number of high school students entering the School of Printing Management and Sciences at RIT during the past 20 years. In 1980, the author taught only one three-credit course every quarter along with six repeated lab sessions. The teaching load was 20 contact hours per week with 60–70 students per quarter. In the early 1980s, teaching productivity, in terms of the number of credit hours per year, was three-credits times 200 students, or 600 credit hours per year.

In the 1999–2000 academic year, the author was responsible for teaching five courses and he taught three courses per quarter. Class size varied anywhere from six students, in a professional elective course, to sixty students in a required sophomore course. There were no longer any repeated labs. There is no question that the author covered more subject areas. However, his teaching productivity, in terms of credit hours generated per year, significantly dropped to 300–350. In other words, the determining factor in teaching productivity is mainly the number of students enrolled in the class, not the teaching capacity of the faculty.

A growing trend in higher education is that adult students are returning to college either for degrees or for short-term training required by their jobs. Many institutions now compete fiercely to reach these adult learners.

Role of Faculty and Administration

The second issue that the author wrestled with...
had to do with the role of faculty and administration in higher education. The administration contends that the student enrollment drives the operational budget. On the other hand, it is the faculty who are in charge of curriculum development and its delivery. The bottom line is that both faculty and administration are challenged to keep an up-to-date curriculum in order to attract more students and to drive the student enrollment up.

RIT has been investing in its distance learning program since early 1980s, and has conducted numerous educational technology workshops to help faculty members adopt on-line instructional technology. RIT currently has 14,000 students and over 2,000 of those students study from a distance. The number of distance learning students and courses are expected to grow at a compound 10% rate for the next several years (The Edge, 1999).

Technologies of On-line Education

Hardware and software used for on-line education continue to change at a very fast pace. Distance learning began as early as 1981 using hardware like Apple IIe (with 48K of memory!) and 300 baud modems (Andrew Feenberg, 1999). Today, we have personal computers equipped with 1,000 times the memory and 100 times the data communication speed—all for almost the same price as the old Apple IIe.

A number of easy-to-use on-line communication technologies are ubiquitous. For example, FirstClass conferencing software serves as a virtual classroom. The Internet is used to disseminate class information via friendly web browsers. E-mail correspondences with instructors can take place on a daily basis. Thus, the content delivery process for distance learning and the student-faculty interactions have become more enabling and cost-effective than ever before.

Self-awareness

Paradigm shift is a concept which describes how the rules of any process, including society itself, change, and why old processes are replaced by new ones. Moving from analog- to digital-imaging in graphic arts is a prime example of a paradigm shift. Paradigm shifts often result in the need for employees to update their work-related skills.

Traditional classroom teaching requires both the students and the teacher to be in the same place at the same time. In order to serve the growing needs of adult learners, who often cannot afford to leave their jobs and homes, on-line distance learning—at any place and at any time—may be the paradigm of education in new millennium. The author strongly believes that adopting distance learning is necessary to enhance teaching productivity and to maintain the viability of an academic program.

When the author prepared his distance-learning courses, he was fascinated by the capabilities of communications technologies—for example, high bandwidth videotape, vast Internet resources, and user-friendly conferencing software with around-the-clock email capacity—as instructional tools. Using these enabling communications technologies, on-line instruction can reach a larger pool of students. Thus, teaching productivity can be increased.

In traditional classroom teaching, faculty who own the content are always involved in the delivery process. However, when the content is captured on video and is distributed by the distance learning department, the faculty member may no longer have total control of the delivery process. Thus, a dilemma exists: should a professor increase teaching productivity through on-line delivery and face the possibility of losing control of instructional contents or should that professor maintain the status quo? There is really no clear solution to this dilemma. The only way to find out is to implement distance learning and evaluate the outcome.

Distance Learning Preparation

The author’s first distance learning course, Imaging Technology, was a sophomore level course. All lecture outlines were prepared using Microsoft PowerPoint, and were videotaped at RIT’s professional-quality television studio. Videotapes, unlike text-based media, offer a high bandwidth which is suitable for recording color images for visual demonstrations. The frequency of lecture taping was one lecture per week. Consequently, it took four months to tape the entire lecture series. The course was offered in the summer of 1998 to 30 Xerox employees located throughout the United States.
Compared to lecturing in a typical classroom, videotaping requires professors to make some physical and mental adjustments. For example, one must become comfortable in front of video cameras and intense lighting. In addition, lectures must be clear and concise because there is no opportunity for question and answer sessions during videotaping. Fortunately, the taping process becomes easier after the first few sessions.

In addition to taping lectures, the author prepared a number of instructional materials, including lecture outlines and self-quizzes, using the Portable Document Format (PDF). These materials were made available to students, using the FirstClass program, at the beginning of the distance learning course.

The second distance learning course, Color Perception and Measurement, was offered in the spring of 1999*. The author used a process similar to the one he employed when preparing Imaging Technology. However, he was much more comfortable with the technology. Therefore, the process became easier.

On-line Teaching and Learning

The notion of “asynchronous learning—anytime, anywhere” infers flexibility. However, without structure and discipline, this flexibility can lead to chaos and ineffective learning. Therefore, the ultimate success of a distance learning course depends on structured teaching and disciplined students. Faculty can help instill structure by setting up a course calendar for students to follow, posting reminders about test dates and homework assignment due dates, and so on. However, the discipline to stay on schedule—and not fall behind—must come from the students themselves.

FirstClass Conferencing

Unlike the Internet, which is wide open to the public, FirstClass is groupware that only registered students can access. Figure 1 shows the appearance of the FirstClass user interface for the Imaging Technology course. At the beginning of the quarter, the course syllabus, tentative course calendar, and lecture outlines were placed in various folders that could be accessed through the interface. Since there was no face-to-face communication, students were asked to introduce themselves by posting notes in the “Introducing Yourself” folder. In addition, FirstClass was also used for chat sessions, submitting homework assignments, posting test scores, and so on.

The author was able to use his desktop computer and an Ethernet connection to access FirstClass on campus. He relied on an Internet service provider, a phone or cable modem, and a Powerbook to access FirstClass when he was at home or on the road. He was even on-line with his class when he traveled to the west coast or to Asia. Again, it is modern communications technology which makes “teaching at any time, and at any place” possible.

Internet-based Resource

Teaching technology courses without face-to-face instruction in a laboratory session presents an

The Feasibility of Requiring Students to Purchase a Spectrophotometer

The Color Perception and Measurement course requires that all students have access to a spectrophotometer for purposes of studying color measurement and its applications in the graphic arts. The idea of owning a personal spectrophotometer or densitometer was simply unheard of in the past. However, the cost of a ColorTron II (a two-in-one color measurement device for Mac and PC), offered by X-Rite at a student discount price, proved that it was possible to do so.

* See sidebar at right

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extra degree of challenge. What many do not know is that the Internet is not only a content delivery mechanism, but is also a rich digital imaging resource. The author decided to structure some lab assignments by utilizing Internet resources. For example, he gave an assignment in the Imaging Technology course by asking students to visit web sites of large prepress and printing companies to learn how they cope with web culture and with booming e-commerce. In another assignment, he asked students to find out which digital file formats are used by printing companies and their digital customers. In the Color Perception and Measurement course, he asked students to use AMICO, an on-line database of museum art collections, to study art appreciation and art reproduction.

On-line Quizzes and Tests

The author has been an advocate of using multiple-choice questions in tests. A number of reasons support his preference: (1) multiple-choice tests are objective in nature; (2) the tests can be graded by a test scoring program and test item analyses can be provided; and (3) a test item bank is possible.

To create interaction and to provide learning incentives, the author transformed part of his test bank into multi-session on-line self quizzes. For drill and practice, students could take these quizzes as many times as they wished. If they had difficulties understanding a particular question, they were encouraged to post their comments and questions in FirstClass for discussion.

Administering tests in a distance learning class turned out to be more complex than giving tests on campus. The author started out by sending tests in hard copy form to designated proctors for closed-book tests. The result was not good because the students and their proctors sometimes had a hard time getting together. He then tried Internet-based on-line testing using a time-limited open-book format. This second method was more successful than the proctor-based method.

Survey of Student’s Opinions

Students who took the distance learning courses rated the courses and their instructors highly.

Students in the Imaging Technology course appreciated learning the theory and practice of digital imaging, including the use of a flatbed color scanner for image capture and a personal color printer for color image reproduction. Students in the Color Perception and Measurement course found the laboratory portion of the course more challenging than the lectures. Even though they acknowledged that the course content was well organized, and agreed that the instructor was knowledgeable, pleasant, and helpful, some students felt that they would have preferred more help and guidance in completing their lab assignments.

It should be noted that the Color Perception and Measurement course was, at one time, offered as an on-campus course as well as in the distance learning format. The on-campus group was given the option to either view the videotaped lectures at their own pace or to view them during the regularly scheduled class hours. The author discussed major points of the lecture right after the videotape and provided a question and answer session afterward. A part of the scheduled class time was used to go over lab assignments and to demonstrate the use of color measurement instruments. Most of the on-campus students rated the quality of their interaction with their professor very highly. They commented that both taped lectures and lab assignments were major sources of their learning. However, some students still expressed a preference for live lectures over videotaped lectures.

Self-assessment

The author’s experiences in distance learning, thus far, have been successful and exciting. Many factors have contributed to this success. The most important factor is the market demand for distance learning opportunities by adult learners across the country. The distance learning program at RIT helps increase the student enrollment. It also helps increase teaching productivity. The second factor is the fact that RIT views distance learning as a strategic imperative. The author was motivated and want to be a vital part of that initiative. In addition, strong support from the instructional media technology staff made the experience worthwhile.

Having taught distance learning a number of times, the author’s initial concern of content own-
ership has become less of an issue. In the same way that a textbook does not replace the teacher, distance education does not render the instructor unnecessary. Videotaped lectures are only a part of the learning activities. Students still need to interact with the instructor—whether face-to-face or via electronic communication—in order to maximize their learning.

The author recognizes that he needs to continue to improve the quality and effectiveness of his distance learning courses. For example, he must update his videotaped lectures on a regular basis. Specific improvements include updating lecture content and replacing software demonstrations with more current versions. Another area of improvement is to further utilize Internet resources to create more lab assignments to make learning interesting and fun. In addition, he needs to work with distance learning specialists to enhance the performance of the on-line testing system.

Postscript

In September of 1999, RIT offered a digital imaging certificate program using distance learning technology. The program consisted of seven courses, and two of the courses were taught by the author. Because of the asynchronous nature of on-line instruction, it was possible for students to receive quality instruction without travelling to the campus. It was also possible for faculty members to provide quality instruction at any time and at any place.

For more information about distance learning at RIT, please go to http://distancelearning.rit.edu.

References