

Distance Education and the Undergraduate Curriculum

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Since the beginning of the technological revolution in the 1970s, distance education has taken on several distinctive forms that reflect the characteristics of different technologies and an ever-increasing mixture of technologies within individual distance education programs. One must understand the variety of practices in distance education in order to grasp the power of distance education as a change agent for the undergraduate curriculum.

The oldest form of distance education--independent study--assumes an individual student studying in isolation from other students and from his or her instructor. For many institutions, this form of distance education is a stable tradition of long standing; as a result, it is often overlooked in discussions of U.S. distance education, despite its contributions to increasing access to undergraduate programs. More recently, advances in telecommunications have permitted the development of a distributed classroom model of distance education that serves groups of students in a live, interactive environment. Currently, a third approach is evolving as a result of advances in computer-based communications, which allows for the creation of an asynchronous learning community. Each of these forms assumes a different set of relationships among students, faculty, and the subject matter being learned. This chapter will look at the impact of each of three kinds of distance education on undergraduate programs.

Independent Study and Undergraduate Education

The Independent Study model of distance education assumes that the educational experience has been structured to give students the greatest possible control over the time, place, and pace of education. These elements of learner-centeredness have become the classic definition of distance education. Within this very general definition, there are a wide variety of practices that can be grouped in three models. These models represent not so much differences in instructional purpose as they do differences in technology and in institutional purpose. However, the differences have proven to be significant ones in terms of how the practice of distance education has affected undergraduate education. They are: correspondence study, telecourses, and the open university.

The Correspondence Study Model

Correspondence study--which today is generally called independent study or independent learning--

began in the United States in the 1890s in response to a very specific social dilemma: the need to improve the quality of life rural farming communities and to improve the practice of agriculture at a time when many feared the loss of the nation's agricultural base due to the migration of people to cities during the industrial revolution. Initially, independent study was focused on noncredit instruction. Specifically, the goal was to train farmers in agriculture and related fields.

Correspondence Study used the nineteenth century counterpart to the National Information Infrastructure-- rural free delivery-- to reach newly empowered rural students. The "technology" of correspondence required a reliance on the written word. Course guides gave faculty an opportunity to organize the scope and sequence of the courses in written lessons that replaced the normal lecture. Correspondence courses could integrate texts, printed visual materials, etc. In turn, the students was required to respond in writing, through essays that demonstrated the student's reflective understanding of the material.

From its inception, correspondence study was seen by practitioners as a student-centered system. Penn State began a correspondence program in agriculture in 1892. Two years later, the annual report of what was then called the Pennsylvania State College described the program as a "home reading" program modeled after the Chautauqua approach. The report also suggests that, from the beginning, distance education has extended the boundaries of our universities; of the first four graduates of Penn State's the program in agriculture, two were from Pennsylvania, one from Canada, and one from the Oklahoma Territories.

Over the years, correspondence study has evolved into a multiple media system at many institutions. Printed texts and course guides are complemented by other presentation media (audiocassettes, videocassettes, slide sets, computer software, etc.), new forms of interaction (fax, phone conferences, electronic mail), and increased access to other learning resources (computer data bases, CD Rom, etc.). The key to the model, however, remains with empowering the individual student to study independently and to control the time, place, and pace of study.

This approach, originally applied to noncredit instruction, eventually carried over into credit courses. Among the U.S. leaders in use of independent learning for undergraduate programs are Penn State, Brigham Young University, University of Nebraska, and University of Wisconsin-Extension. The economics of independent learning make it an excellent mechanism for delivering narrowly defined undergraduate degrees to widely scattered student populations. For example, Penn State offers undergraduate, associate degrees in dietetics, gerontology, and small business management.

For the most part, university-based correspondence programs are housed at state universities and land grant institutions (the major exception being Brigham Young University) and operate as extensions of the university's residential curriculum. Often, these programs not only serve distant students but provide resident instruction students a second option for scheduling courses. As a result of this organizational structure, independent study has not been widely used to change the curriculum itself. Independent Study has been a means by which traditional colleges and universities have extended their existing degree programs.

The Telecourse Model

While the independent study model developed at larger state universities, the telecourse model is identified primarily with community colleges. As with correspondence study, the initial incentives in the development of this model were social and institutional rather than curricular. In the late 1960s and 1970s, many urban community colleges saw a dramatic increase in enrollments due to a combination of two factors: (1) the arrival of the baby boom generation to college age and (2) the development of open enrollment policies within some states as a way to increase access to college for poor and historically disadvantaged populations. This enrollment pressure occurred at a time when public television was in a period of rapid growth. Both community-own stations and educational licensees saw service to education as a primary mission of what was then called "educational broadcasting." As a result, several key community college districts began to experiment with the use of public television to reduce campus space pressures by delivering courses to students at home.

The basic telecourse model involves three elements: a text, a study guide, and a series of video lessons. A fourth component might be occasional on-campus meetings. Originally, the video lessons served to replace the classroom lecture; as a result, the typical telecourse model consisted of 30-45 half-hour video lessons. Over time, the video component of a telecourse has moved away from the studio lecturer and is often a highly produced video documentary that explores a particular theme within a lesson, provides a case study, or illustrates the key elements of a lecture. The direct one-to-one correlations with the traditional number of classroom lectures has eroded, as telecourses have been developed to fit into public broadcasting schedules or have been developed around general audience series, such as *The Ascent of Man*, *Connections*, or *The Civil War*.

By the 1980s, the telecourse model had become a national trend in community colleges, as other community colleges and universities began to adopt for their own curricula telecourses produced by such pioneers in the field as Dallas Community College, Coast Community College, and Miami-Dade Community College. Local institutions would broadcast the video programs over local public television stations or cable access channels. Within states, colleges formed consortia to get the best prices for individual telecourses. In 1981, the Public Broadcasting Service initiated an Adult Learning Service that became a national broker for the distribution of telecourses. This centralized service greatly reduced the cost of telecourse licenses to individual colleges and universities and provided a national distribution outlet that helped stimulate external funding for telecourses. Since 1981, more than a million students have enrolled in courses offered by local colleges and universities using telecourse packages distributed by PBS.

The telecourse model also has been advanced significantly by the Annenberg/CPB Project. Since 1981, the Annenberg/CPB Project has funded the development and distribution of many highly used telecourse packages. The Project raised the video production standards for telecourse production and helped bring this end of independent study into the mainstream of community college life and into many four-year curricula. While designed for the at-home viewer, video programs from Annenberg/CPB telecourses have also been used to supplement and enhance on-campus undergraduate education.

More recently, the Annenberg/CPB Project has invested funds to help institutions develop institutional policies and procedures needed to create a more productive integration of telecourses in the undergraduate curriculum. These projects move beyond the production of materials to address issues of administrative and academic policy, faculty development, and student support services that are needed for an institution to fully incorporate distance education into a coherent extended-access curriculum.

Telecourses have had an important effect on the acceptance of distance education in the United States. The production of nationally delivered telecourses has added new dimensions to the treatment of subject matter in distance education. The Annenberg/CPB Project course on physics, for example, offered students highly visualized animations of physics concepts, as well as classroom lectures by internationally known physicists. In addition, telecourses developed as supplements to PBS series, such as Connections and The Civil War bring major documentary materials into courses, greatly enriching the experience of isolated students.

The Open University Model

The open university movement, which began with the establishment of the Open University of the United Kingdom in 1970, set out not only to increase access but to create a distinctive curriculum. The Open University established the model of a fee-standing distance education teaching institution. Because its curriculum was designed entirely for students at a distance, it was able to use the course design process to create a unique, highly interdisciplinary curriculum and allowed students to earn complete degree programs at a distance.

The Open University model has been widely emulated around the world. In the United States, the concept as emulated in nontraditional institutions within state systems. The best examples of this approach in the U.S. are the University of Maryland University college and Empire State College in New York. Both programs began by adapting British Open University courses to the U.S. Today, both maintain many of the characteristics of the British courses in their own course development activities. This includes a multi-disciplinary approach and the use of a course team to develop materials.

While few U.S. universities have fully adopted the open university model, it has had a broader impact thanks to the International University Consortium. Founded by the University of Maryland University College in 1980, IUC expands the open university model by making individual course packages available to its member institutions. IUC's original courses were UMUC adaptations of British Open University courses. More recently, it has developed its own courses, using the UMUC model. Courses such as War and American Society, The Middle East, and Managing in Organizations suggest the continued interdisciplinary approach taken by IUC.

Independent Study and Undergraduate Education: Summary

For more than a century, the independent study approach to distance education has served to extend the

undergraduate curriculum to off-campus students. Independent Study has served to give learners more control over the time, place, and pace of study. Not incidentally, it has also had an impact on the resident instruction program of institutions that offer independent study. It is not unusual for resident instruction students to mix independent study courses with their regular on-campus courses. At the same time, it is not at all unusual for faculty who design materials for independent study to use them in their resident classes.

Telecourses have also served to bring new resources into undergraduate curriculum. Video programs produced for nationally distributed telecourses are often used as in-class audio-visual support for resident courses.

However, with the exception of curricula that have emulated the open university model, independent study has not had a significant effect on the underlying assumptions and structure of the undergraduate curriculum. Its impact has primarily to increase access to higher education. In this respect, however, its impact has been significant, touching the lives of hundreds of thousands of students in U.S. colleges and universities annually.

The Distributed Classroom

The 1990s have seen the rapid growth of the distributed classroom model of distance education. As early as the 1950s, universities began distributing class sessions in popular courses on-campus by using closed circuit television to interconnect small classrooms. The effect was to offset the lack of large lecture halls and make better use of smaller facilities. The resulting one-way video, two-way audio" method eventually took advantage of ITFS channels, state microwave networks, and, ultimately, satellite to extend the university's on-campus programs to branch campuses and to selected worksites. Examples of off-campus distributed classroom systems have been in operation since the 1970s and include the Indiana Higher Education Telecommunications System, the satellite-based National Technological University, and numerous Instructional Television Fixed Service networks that interconnect individual colleges and universities with worksites, especially for engineering and nursing curricula.

This model was greatly stimulated in the 1990s by the arrival of interactive compressed video telecommunications systems, to the extent that many people now define distance education in terms of interactive telecommunications. A recent legislative analysis report noted that every state in the Union currently has a distance education distributed classroom network of some sort in development.

The physical characteristics of the distributed classroom model define its educational approach. Whether the system uses microwave ITFS channels or dialup interactive video, the systems share several essential characteristics.

- First, the distributed classroom is a real-time delivery system. it is live and, as a result, spontaneous.
- Second, the distributed classroom reaches fixed, predetermined sites chosen by the sponsoring

institution rather than by the individual students; in this sense, the distributed classroom is defined by its technological infrastructure than by any particular instructional design.

- Finally, the distributed classroom is marked by the opportunity for spontaneous, real-time interaction between instructor and students.

Behind these characteristics are other assumptions that distinguish the distributed classroom from independent study. For example, the distributed classroom assumes that the institution retains control over the time and pace of study. Telecommunications is used to give students more options with regard to the place of study. Beyond that, this kind of distance education has more in common with traditional classroom study than with other kinds of distance education. Instruction can be highly spontaneous, highly interactive, even Socratic in nature, but the emphasis remains on the instructor-centered, lecture-based approach that characterizes most classroom instruction.

While the distributed classroom model has been most attractive to graduate programs, the growth of statewide networks has also increased its use in undergraduate education, both for delivery of programs off campus and for sharing of resources among resident instruction programs at several campuses.

The Electronic University, a guidebook to telecommunications-based distance education programs, lists a wide variety of curricula that demonstrate the impact of this approach to distance education on undergraduate programs. The guidebook profiles some sixty U.S. colleges and universities that offer undergraduate courses via electronic distance education. The profiles demonstrate the broad range of undergraduate programs that are extended through electronic distance education. This includes individual courses to full degree in programs in curricula ranging from liberal studies to computer science. Perhaps the most common undergraduate degree program offered by these institution is the Bachelor of Science in Nursing. A variety of other undergraduate professional degrees are also represented, including fire protection administration, accounting, counseling psychology, paralegal studies, professional aeronautics, agriculture, electrical engineering, and health care administration. At the same time, this methodology is being used by some institutions to deliver more traditional academic programs such as liberal studies and Biblical studies.

The Electronic University also illustrates that electronic distance education has evolved into a multiple media delivery system. For example, the New Jersey Institute of Technology offers a Bachelor of Arts in Information Systems through a combination of videocassettes and computer conferencing. Washington State University's Bachelor of Arts in Social sciences uses a combination of cable television, computer conferencing, fax, public television, and satellite television. Rochester Institute of Technology offers a Bachelor of Science in Applied Arts and Sciences that uses a combination of audiographics, cable television, computer conferencing, electronic bulletin boards, electronic mail, fax, public television, teleconferencing, telephone, and videocassette.

Interactive telecommunications has greatly expanded access to undergraduate education and has served to blur the boundaries between continuing and resident instruction and, ultimately, between distance and classroom instruction. However, it has had little effect on the actual structure of the undergraduate curriculum.

The Learning Community

Both independent study and the distributed classroom have had a significant effect on the access that students have to undergraduate education; they have given students greater control over the time and place of study. They have also contributed, in varying degrees, to a more learner-centered approach to education, giving students greater control over the pace of study. However, with the exception of the open university model, which has had relatively little impact in the United States, distance education has had little effect on the basic assumptions on which the undergraduate curriculum is based

This situation is changing as newer technologies enter into the distance education arena. The primary technological agents of change are computer-based communications--from electronic mail to the world wide web--and CD ROM. These technologies, in combination with others already being used in distance education, offer to give students not only a much richer environment for spontaneous interaction, but greater control over the subject matter being studied and over the pathways through that subject matter, creating a new kind of learning community.

The learning community approach to distance education assumes an instructional design in which the student is asked to use a mixture of media. Each medium plays a specific part in articulating a complex learning environment. These may include presentation media, such as print, video and audio tape, computer software; delivery media, such as broadcast/cable television, computer file servers, CD-ROM, etc.; and interaction media, such as audio and video conferencing, electronic mail, keypad response systems, and digital voice response systems. In addition, students may have access to the range of library resources and data bases resident on the world wide web.

While the learning community approach calls on many media, it is defined less by the media themselves than by the learning environment that is created through the use of multiple media. The impact of the learning technology is to greatly enrich the resources available to the student and thus increase the learner's control--and responsibility--in the overall teaching/learning process. The resulting learning environment is characterized by its focus on the learner and on enriching the resources available to the individual. Similarly, the use of multiple communications technologies create an environment that is both asynchronous and spontaneous.

These key characteristics--asynchronous, resource-based, learner-centered, spontaneous--are responsive to the stresses that are currently reshaping the undergraduate curriculum. Access is no longer the primary driving force behind this type of distance education. The defining characteristics are no longer necessarily geographic distance, but learner control and an active learning environment that emphasizes learner interaction with resources, with other learners, and with the instructor.

In the process, the learning community approach is blurring the lines between distance education and resident instruction. As universities turn toward an undergraduate curriculum that is more collaborative, resource-based instructional models on campus--including the use of computer simulations, hypermedia-

based studies, and in-classroom use of the worldwide web and other on-line resources--the experience of students on campus becomes less classroom bound, more learner centered.

Conclusions

Distance education is moving with increasing speed into the mainstream of college and university life. At the undergraduate level, two primary approaches are emerging. One is a heightened individualized distance education model, based on the original correspondence model, that gives students great flexibility and control over the learning environment. The second is the inheritor of the distributed classroom model, which provides for both group and individualized study, with the notion of a "class section" gradually being replaced by the idea of "cohorts" who work both collaboratively and independently in a resource-rich learning environment.

While both of these models were designed originally to serve "nontraditional" students, the underlying methods and media of distance education are taking their place on campus as our colleges and universities redefine the curriculum for an information age and attempt to serve a student population that is so diverse as to make outmoded the concept of "nontraditional" student--or delivery system. For the undergraduate curriculum, distance education is both a signal of change and a tool for change.

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