Three Challenges

The 178 Jesuit institutions face many challenges. Three are more or less common to all. The first is that the number of Jesuits worldwide is declining. Currently 4,561 Jesuits work in Jesuit institutions of higher education, along with 74,750 non-Jesuit faculty colleagues. This ratio in itself does not mean that these institutions are in danger of losing their Jesuit character. For decades, many "Jesuit" institutions have been staffed primarily by non-Jesuit colleagues who are dedicated to the Jesuit character of their schools. But a future with notably fewer Jesuit educators is a matter of serious concern for the future of Jesuit education.

Establishing financial stability is a second challenge for all Jesuit colleges—even though the seriousness of this challenge varies greatly from school to school. In some instances, schools receive government subventions; a few that rely on tuition and private donations are relatively secure, while many, especially those that serve primarily low-income students, face severe constraints. This problem is not a new one and is shared with other institutions of higher education, whether public or private.

Today, Jesuits can be found working directly with refugees, the unemployed, and the homeless, but the Jesuit response to the directives of various General Congregations is also increasingly carried out in Jesuit colleges.

A third challenge is unique to religious institutions—establishing the appropriate relationship between an institution and the local Roman Catholic bishop and the Holy See. The issue has come to the fore recently with the 1990 Holy See document, "Ex Corde Ecclesiae," and subsequent attempts by national groups of bishops to develop specific norms to implement general principles governing the college-hierarchical church relationship. Jesuit universities, specifically their theology faculties, are obviously "Catholic" in some sense. At issue is how this fact is to be understood juridically in such different locales as Omaha, Seoul, Madras, and Managua. How is the freedom a university must enjoy from inappropriate interventions—whether by a bishop, or a benefactor, or a government functionary, for that matter—to be reconciled with the Church's legitimate concern that theology taught under the rubric of "Catholic" be consistent with the Catholic tradition? The answer to that question undoubtedly requires dialogue and mutual trust. ■

Continuous Learning: The Killer Application of Technology

Jack Wilson

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The killer application of computing is learning. The computer has evolved from a wonderful calculator to a great typewriter, to a fancy television, and with the advent of the World Wide Web, to a four-color sales brochure, which is where we are today. To move forward and fully realize the promise of technology, we need creativity and courage, as well as a deep understanding of the way we learn and retain information.

At a recent meeting of the American Society of Engineering Education, Christopher Galvin, president of Motorola, declared that the company no longer wanted to hire engineers with four-year degrees. Instead, he said, they needed employees with 40-year degrees. Motorola is representative of the many companies where continuous learning is crucial, making learning the killer app of this generation of computing.

The traditional model of distance learning has merely pushed back classroom walls, using a lecture-based format with one-way transmission and no interaction. This is the *mainframe model*, akin to the old-style mainframe computer with several dumb computers hooked up to it. We need to progress instead to a *client server model*, wherein every student and every faculty member is a resource, comprising a rich interacting community of learners. The challenge is how to use technology to create such a collaborative learning environment.

Curriculum Reform at Rensselaer

Over the last seven years, Rensselaer has been reforming its undergraduate education in science, mathematics, engineering, and technology in an effort to improve the quality of its education and incorporate technology into its curriculum. Minimizing costs has also been a goal. To that end, merely bolting technology on top of what already is being used, which invariably costs more, has been avoided whenever possible. Instead, technology is being used to change the learning process itself. This change should by no means reduce the need for faculty—unless you accept the mainframe model of education, in which case faculty could be replaced by a CD-Rom or Web site, and one star professor could teach every student in the country. In the collaborative learning model, however, the aim is to help faculty become more productive.

In addition to reforming its curriculum, Rensselaer is

also interested in the $60 billion market in corporate education that has burgeoned in recent years. Models developed at the undergraduate level can readily be adapted to tap this vast potential revenue source by helping to create efficient and effective continuous learning environments.

Studio Courses

One of the key innovations adopted at Rensselaer as part of its reform efforts has been the introduction of studio courses to replace large, introductory, lecture-based courses in science and engineering. Studio courses apply an integrated, multidisciplinary approach and incorporate technology to create a better learning environment for students and a better teaching environment for faculty. The courses are designed to bring the interaction often found in small-enrollment classes to large introductory classes. Lecture, recitation, and laboratory are combined into one facility, the studio—capable of accommodating all three teaching methods—where the faculty conducts hands-on interactive learning sessions. While the courses use advanced-function computing technology and tools, they actually are quite structured; their pace is determined by the faculty rather than by student participants.

To a certain extent, the studio format is designed to transfer some responsibility from the faculty to the student. The focus is on student problem solving and projects, not on presentation of materials. The emphasis is on learning rather than teaching.

Responsible stewardship of student and faculty time and resources is reflected in the reduction from six contact hours in the traditional course to four hours in the studio course. Evaluations demonstrate that students learn material better and faster despite the one-third reduction in contact hours. For large introductory courses, cost savings have been estimated as ranging from $12,000 for mathematics courses to over $100,000 for physics courses each time they are taught.

Going the Distance: The Virtual Studio

The challenge now is to progress beyond traditional modes of distance learning to providing the distance learner with as much of the studio experience as possible. In this model of interactive multimedia learning, one creates a virtual studio with students connected over a network that carries data, voice, and video to the students' computers. Each student has access to multimedia materials created for the course and delivered from CD-Rom or via the network. A careful balance must be struck between synchronous and asynchronous activity, adjusted to suit each course and audience.

Conclusion

In the future, universities will differentiate themselves based upon their audience and core expertise. Some will endeavor to become brand name institutions that will deliver outstanding educational experiences with high perceived value in particular areas of core expertise. Others will provide broad access to a commodity-style education at competitive costs.

A continuous learning system will evolve, in which the education of 18- to 21-year-olds in cloistered surroundings will be one small part—real growth will come in providing educational opportunities in the workplace and home. All institutions will be affected by the profound changes in teaching and learning being wrought by advances in information technology. ■

Quality Assurance Management

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A review of recent international practice in the management of quality assurance shows tremendous variety in approaches and methodologies, providing a wide range of possible models for both systems and institutions.

Administrative Responsibility

The most common patterns at the national level are for responsibility to lie with specialized units or agencies set up by the government or for responsibility to be given to the central agency responsible for higher education coordination, whether it be a ministry of higher education or a university grants commission. One of the major issues concerning government agencies responsible for quality assurance relates to the degree of independence they should have from both ministers and major ministries and departments.

In a small number of countries, responsibility at the national level is under the control of an agency set up by higher education institutions. Similarly, within higher education systems, arrangements differ widely. Sometimes presidents or rectors take responsibility, while in other cases responsibility lies with an academic council or board.

Participation in the Program

An important variation between quality-assurance systems is whether participation is voluntary or compulsory. Many countries began with institutional audits, on a voluntary basis. Thus, in Britain, the institutional audits run by the Academic Audit Unit (AAU) were voluntary, and the Research Assessment Exercise run by the Higher Education