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## Corporate Classrooms

Education and training within corporations of the United States is an important and growing industry.\* It has been estimated that in 1981–82 annual costs were around \$60 billion. This was comparable to the total spent by all of the country's 4-year universities and colleges. The number of students trained was also nearly comparable. Educational programs are more abundant and more highly developed in the large technologically active companies than in small companies.

A substantial fraction of the training is for engineers who need to keep abreast of rapidly changing technologies. But all components of the work force may be involved. There is compensatory education for disadvantaged employees and courses for those in management and sales. About 70 percent of corporate education is in-house training, allowing businesses flexibility with respect to content, time, method of presentation, and making changes when desirable. Much of the training is decentralized—that is, it is conducted in the various departments and branches of the companies. However, about 400 business sites include a building or campus devoted to education. Western Electric's Corporate Education Center at Princeton has a 300-acre campus, private rooms, excellent cuisine, and lighted tennis courts. The equipment is technologically advanced and supports effective, intensive courses. The atmosphere at this and other corporate educational centers is intense but cooperative and collegial. Courses are usually short, schedules tight, and goals explicit.

Teaching methods at companies are often similar to those at universities, but more effort is devoted to increasing instructional effectiveness. Computer-assisted instruction is used extensively and films and programmed materials are employed. Computer networks that link voice, graphics, text, and audio allow personalized classrooms. As might be expected, corporations are devoting considerable efforts to improve their instructional methods. Digital Equipment officials assert that they have made notable progress. The company has a computer system called IVIS that analyzes how a particular student learns. The system provides text, voice, graphics, and audio elements and responds to student behavior. Digital says that IVIS-trained students learn up to 53 percent faster and with better retention than students taught by conventional methods.

A potential market exists for university-created videotaped instructional material for corporations. A small fraction of this market is currently being served, and demand is expanding. This demand is being met in part by 28 universities that belong to the Association for Media-Based Continuing Education for Engineers (AMCEE).† It rents or sells some 400 videotape courses on engineering and related subjects. The tapes were used at 1500 sites last year. This academic year they will be shown at 2500 sites.

A new organization, the National Technological University (NTU),‡ will grant master's degrees. It plans to use television broadcasting in real time via satellite. Some 19 universities that have television and videotaping facilities are involved, and the best of the professors will be on the air. The latest catalog includes 246 courses. A student in NTU can major in computer engineering, computer science, electrical engineering, engineering management, or manufacturing systems engineering. Students must be sponsored by their employers, who in turn support NTU. Companies involved include Eastman Kodak, General Electric, Hewlett-Packard, and IBM. Thus far, 40 companies participate and a goal is 150 or more.

The new electronics technologies have created new opportunities in education. Many of the values and procedures of the universities have stood the test of time. But as corporate classrooms expand, it is clear that universities should be alert to developments elsewhere.

—PHILIP H. ABELSON

\*N. P. Eurich and E. L. Boyer, *Corporate Classrooms* (Carnegie Corporation for the Advancement of Teaching, Princeton, N.J., 1985). †AMCEE, 225 North Avenue, Atlanta, Georgia 30332. ‡NTU, P.O. Box 700, Fort Collins, Colo. 80522.