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Implications of Distance Education for CTE. ERIC Digest No. 227.

An array of forces worldwide is having a profound effect on the way education is delivered, including career and technical education (CTE). Distance education is increasingly seen as a powerful vehicle, especially when provided through information and communication technology (ICT). This Digest discusses the implications of distance education for CTE, with an emphasis on the implications of distance education through ICT.

Changes in Educational Delivery.

Fast-paced and pervasive changes are occurring in the economic, social, and technological foundations of education and educational delivery (Dirr 1999). Short product cycles, a fast-expanding knowledge base, and the rapid obsolescence of existing knowledge put tremendous pressure on employers to upgrade worker skills in a timely, effective, economical manner--"just in time" (JIT) training. Workers are often reluctant to interrupt their careers for full-time study in traditional educational settings; lifelong learners want greater flexibility to accommodate diverse personal circumstances. Changes in the infrastructure, capacity, functionality, and cost of information and communications technology (ICT) have increased access to ICT, the use of ICT for educational purposes, and the suitability of ICT as a medium for learning in line with an evolving pedagogy of learning that is constructivist, interactive, collaborative, learner centered, and just in time.

In response to such changes, there has been a resurgence of distance education, particularly in postsecondary education (Greene and Meek 1998; Lewis et al. 1999). In just 3 years, from 1994-95 to 1997-98, the number of distance education courses offered rose from 25,730, with about 760,000 students enrolled, to 54,470 courses offered, with about 1.66 million enrollments. The number of graduate and undergraduate degree programs available by distance education rose from 690 in 1995 to 1,190 (500 undergraduate) in 1997-98; certificate programs increased from 170 to 330 (160 undergraduate). The most common ICTs used in 1995 for distance education were two-way interactive video and one-way prerecorded video; by 1997-98, they were edged out by Internet courses with asynchronous computer-based instruction.

Distance Education in CTE.

Comprehensive nationwide statistics are not available specifically for postsecondary CTE distance education, but available data suggest CTE involvement (ibid.). By 1998, 62 percent of public and 5 percent of private 2-year postsecondary institutions offered distance education courses. Even in 1995, 39 percent of institutions offering distance education were targeting professionals seeking re-certification, and 49 percent were targeting workers seeking skill updating or retraining.

Internet searching reveals examples of postsecondary CTE distance education via ICT. Consortia like the Community Colleges of Colorado ccconline.org and the Ohio Learning Network www.oln.org expand access to member institutions' distance occupational associate degrees and certificates with supporting coursework. Rio Salado College www.rio.maricopa.edu specializes in flexible delivery beyond the traditional

campus and offers about 300 distance courses, with a wide variety of occupational degree and certificate programs, in Internet, print-based, audio, video, computer, and CD-ROM formats. The Global Network Academy's Distance Learning Catalog www.gnacademy.org/mason/catalog/browse.html provides information and links organized by subject areas or educational levels; the Distance Education and Training Council www.detc.org lists occupational associate and other degrees offered by accredited institutions and links to those institutions.

Faculty Development.

A recurring theme is the need for faculty development for distance education, particularly using ICT (Miller 1997; Murphy and Terry 1998; Nahdi 1999). Faculty at all levels, from postsecondary teacher educators to secondary instructors, typically reported that, although favorably disposed, they lacked knowledge and skills needed for effective delivery; in addition, many faculty report that they have had no experience in distance education or ICT delivery. In-service training was frequently cited as a solution.

Access.

Learners, educational institutions, and CTE programs need physical access to the ICT networks used to deliver distance education (Bowen and Thomson 1995; Miller 1997; Van Dusen 2000). In addition, institutions must supplement Internet access with an intranet of connections between and within buildings and personal computers (PCs) and liberal access to PCs for both faculty and students; satellite dishes or dedicated land lines may also be required for one-way or two-way video. Individual learners need ICT access--typically Internet access and a PC. Limited availability of Internet connections in remote areas and the cost of PCs and Internet services contribute to a digital divide--unequal access across income levels, demographic groups, and geographic areas--that in practice deprives some learners of access to distance education via ICT. Yet distance education, particularly via asynchronous online delivery, can help increase access to learning opportunities by loosening rigid constraints of time and place, allowing flexible delivery methods, and using adaptive technologies to meet the needs of learners in remote locations, those with disabilities and literacy needs, and women with family responsibilities (Booker 2000; Kearns 2000).

Cost.

Distance education via ICT can be expensive both in startup and ongoing costs (Van

Dusen 2000). Initial hardware and software purchase costs, although substantial, may be dwarfed by the expense of frequent upgrades, faculty development, and technical support; course design and development require considerable and expensive faculty time.

Effectiveness and Appropriateness.

The academic rigor (active learning, effort, high cognitive level) of distance education was sometimes perceived as lower than that of traditional face-to-face instruction (Miller and Shih 1999). The appropriateness of ICT for hands-on learning experiences has been questioned (Miller 1997), although one study reported high student satisfaction (backed by instructor ratings) with an asynchronous Web-based program to develop hands-on horticulture skills (Mudge and Way 1999), and another concluded that paper-and-pencil testing and Internet-based computerized testing of occupational competency test bank items were equivalent (Kapes et al. 1998). One important aspect of effectiveness is learning style; some studies characterized the successful distance student as an independent learner (e.g., Tucker 2000), but others found no correlation between learning style and learning outcomes (e.g., Day et al. 1997).

One review (Phipps and Merisotis 1999) questions the quality of current research on the effectiveness of distance education in higher education, citing some frequent shortcomings: lack of control for extraneous variables and for student and faculty feelings and attitudes; non-randomly selected subjects; questionable validity and reliability of instruments used to measure student outcomes and attitudes; and a focus on individual course outcomes rather than program outcomes. A review of program quality measures used by leading distance education institutions (Phipps and Merisotis 2000) identified 24 benchmarks in seven categories (institutional support, course development, teaching/learning, course structure, student support, faculty support, and evaluation and assessment) considered essential to ensuring excellence in Internet-based distance education.

Copyright.

Copyright restrictions may be a barrier in distance education (THE POWER OF THE INTERNET FOR LEARNING 2000; U.S. Copyright Office 1999). Current U.S. copyright law allows fairly liberal use of copyrighted materials by nonprofit educational institutions for educational purposes in a broadly defined "face-to-face setting" without the copyright holder's permission. However, the distribution and use of copyrighted materials, particularly multimedia, via ICT go beyond the provisions of current law because copies of the materials are made on the user's hard drive and because materials on a public

website may be available to the general public. Consequently, educators who use copyrighted materials in a face-to-face setting are often unable to use those same materials for distance education. In March 2001, the Technology Education and Copyright Harmonization Act, S. 487, was introduced to bring copyright law in line with advancements in ICT.

- Accreditation.

Diploma mills, a bachelor's degree in 4 weeks, a second degree in 3 hours-the character, quality, and standards of distance education institutions and programs are critical issues for distance learners, particularly when programs are available via ICT from any corner of the globe (ACCREDITATION IN THE U.S. 2001; DISTANCE LEARNING DISCUSSION BOARD 2001). Accreditation is one means of protecting what can be a considerable investment of learner and public funds; it is often one criterion in determining acceptability of transfer credits-and always one criterion in determining eligibility for federal assistance.

In addition to regional institutional accrediting agencies, two specialty accrediting bodies are recognized by the U.S. Department of Education for distance education (NATIONALLY RECOGNIZED ACCREDITING AGENCIES 2001). The Accrediting Commission of the Distance Education and Training Council accredits private and public distance education institutions offering non-degree and associate, baccalaureate, and master's degree programs primarily through distance education. The Accrediting Commission of Career Schools and Colleges of Technology accredits private, postsecondary institutions, including those granting associate and baccalaureate degrees, that are predominantly organized to educate students for occupational, trade and technical careers, including institutions that offer distance education.

CONCLUSION

Although many have concluded that ICT is as effective as traditional approaches to distance education, that conclusion is not universally accepted. Nor is ICT delivery without problems--faculty development, the digital divide, cost, copyright, accreditation. Nevertheless, to many, the increased access to learning at any time, in any place, for any learner overrides other issues; growing numbers of offerings and enrollments suggest that ICT delivery--whether or not the best of all possible worlds--indeed meets a widely felt need in CTE.

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