DOCUMENT RESUME

ED 439 881 RC 022 353

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TITLE	Capitalizing Distance Technologies To Benefit Rural Children and Youth with Visual Disabilities.
PUB DATE	2000-03-10
NOTE	6p.; In: Capitalizing on Leadership in Rural Special Education: Making a Difference for Children and Families. Conference Proceedings (Alexandria, VA, March 16-18, 2000); see RC 022 337.
PUB TYPE	Reports - Descriptive (141) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Access to Education; Blindness; *Distance Education; Higher Education; *Masters Programs; Program Descriptions; Rural Education; *Special Education Teachers; Teacher Education; *Teacher Education Programs; *Visual Impairments; World Wide Web
IDENTIFIERS	*Course Development; Online Courses; *University of Northern Colorado

ABSTRACT

The University of Northern Colorado developed a master's degree program to train specialists in the education of students with visual disabilities in the 14-state region of the Western Interstate Commission on Higher Education. The program is student-centered, stresses effective interaction between faculty and students and among students, and uses academic resources that address the multiple learning styles of students. Although multiple media and distance systems are used to deliver this program, the World Wide Web was chosen as a central learner and instructional resource for the conversion of each course for distance delivery. All courses have embedded syllabi, links to discipline and course standards, course requirements, descriptions of course activities, an asynchronous threaded discussion area, a course schedule, a dedicated class listserv, and a place for additional Web-based and other resources. Student support systems include an online admissions application, a student handbook, a Toll-Free phone number into the special education division office, a Webmaster who responds to technical problems, a CD-ROM with Web browser to load on home computers, and course and enrollment listservs. The project found that the design of distance education courses was expensive and needed much time and expertise; significant specialized design was required since most distance delivery technologies are visual; and extensive advance planning and faculty training were required. (TD)

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CAPITALIZING DISTANCE TECHNOLOGIES TO BENEFIT RURAL CHILDREN AND YOUTH WITH VISUAL DISABILITIES

This paper describes the use of Internet and other distance technologies to train local specialists in education of students with visual disabilities in the fourteen states comprising the Western Interstate Commission on Higher Education. A small proportion of the students in the program are themselves, blind or visually impaired. The paper shares challenges, insights, and practitioner perspectives from the technological, design, and the subject matter experts.

While students who are blind and visually impaired (BVI) represent less than one-half of one percent of the school age population, they are a group of students with multiple and often complex educational needs. One of these needs is for a specialized teacher trained in the methodologies of blindness and the adaptations necessary to facilitate access to the general education curriculum. Rural school districts do not easily meet the needs of these students, in part because of the cost of hiring these specialized teachers, and in part because qualified teachers of students with visual impairments are in short supply. The shortage grows yearly (Ingersoll, 1999), as universities close teacher preparation programs that consume huge amounts of fiscal and human resources without producing equivalent tuition revenues.

Less than 400 new professionals in blindness and visual impairment enter the field annually (Ferrell, 1999). The teacher shortage in blindness has become so severe that the Office of Special Education Programs funded a special project to investigate the depth of the problem and to develop a national plan for meeting the personnel needs of the future. Although the results of this project have not yet been published, it appears that the nation's capacity to prepare specialized teachers is sorely stretched. Using technology to train teachers at a distance, especially in those states that do not have teacher training programs in blindness, is one way of expanding the nation's capacity while permitting students to remain in their current jobs in their home communities. For rural school districts, this may be the only way they will ever recruit a specialized teacher for their children with visual impairments.

Project Description

In January of 1998, the US Department of Education funded a three year grant project (Federal Grant #H029A70113) at the University of Northern Colorado to design and deliver a graduate master's degree program in blindness and visual impairment to the 14-state region of the Western Interstate Commission on Higher Education (WICHE). The $1.1 M grant project currently offers courses to 78 students working to complete 17 to 62 semester hours of coursework (depending on previous training and experience). These students are geographically distributed across the United States, over half of them in states without personnel preparation programs in blindness and visual impairment. The first classes were delivered in the fall of 1998. Eleven courses have been converted for distance delivery as part of this project and two remain. In the fall of 1999, seven courses were delivered with a total of 73 students registered.

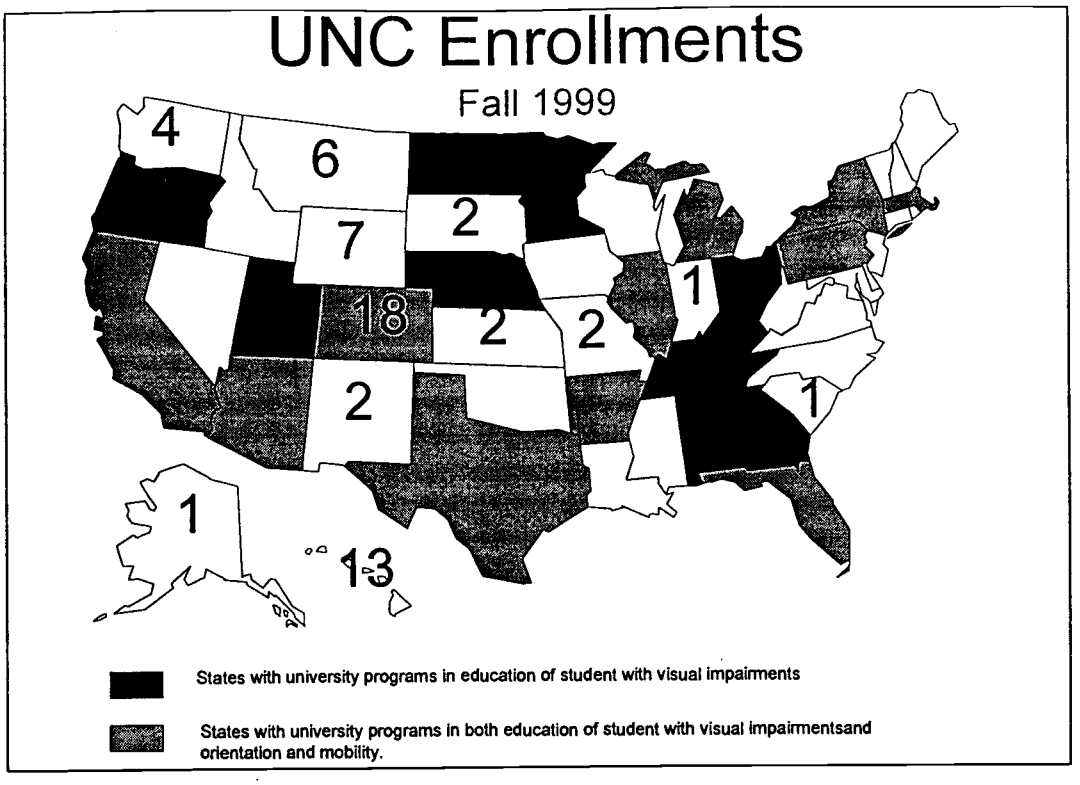

Figure 1. UNC enrollments in Severe Needs: Vision program

Four project objectives were stipulated at the outset. First, to provide faculty support (one semester course release) in the conversion of course offerings to formats suitable for the WWW, compressed video, broadcast, and other distance technologies. Second, to investigate the program's participation in the Western Governor's University. Third, to provide financial support for the costs of course transmission and delivery to WICHE states and to allow for field-testing and evaluation of the distance delivery model. Fourth, to provide financial support to students and professionals from the WICHE states. In addition, all tuition expenses of admitted students who qualify are paid by the grant. Students must maintain a 3.0 GPA and are required by federal law to repay their scholarship if they do not enter the teaching profession.

The BVI faculty at the University of Northern Colorado have a deeply held philosophy about this severe needs program. It was agreed early on that the distance delivered program would subscribe to the same philosophy and that has influenced many design and implementation decisions. The philosophy statement is:

> "The UNC Severe Needs: Vision program is based on a firm and continuing commitment to the rights of all students with visual and other disabilities to receive equal educational opportunities, including equal access to the curriculum. The faculty believes that each learner should be provided educational opportunities that maximize potential for whatever level of independence is possible in order to be productive in society and to live a meaningful and fulfilling life."

While it may be more difficult for the person without sight to take advantage of today's visual distance environments, this project demonstrates that there are many strategies that can be incorporated within distance learning environments to leverage the communication potential of these delivery technologies. A focus on collaboration, sharing, and contextualized experiences allows not just "teaching-by-telling, but learning-by doing" (Stanard, 1999, p. 49).

This project is one example of Molly Broad's comments about virtual learning, or the "fundamental importance of high-quality faculty and effective interaction, both between faculty and students and among students. Faculty rightly believe these are fundamental to good education; however, with the growing array of technology tools, it is possible to achieve those objectives online. In addition, virtual learning can also bring a very rich array of academic resources to the learning process—resources that address the multiple learning styles of students, and resources that greatly enrich the educational materials available to students" (Morrison, 1998, p. 3).

The project team consists of:

- Dr. Kay Ferrell, Project Director and Special Education Division Director
- Chuck Wright, Project Coordinator
- Dr. Kay A. Persichitte, Instructional Design and Distance Delivery Consultant, and chair of the Department of Educational Technology
- at least five other special education faculty
- multiple educational technology graduate assistants

Design and Development Issues

Instructional design (ID) issues that have influenced the project cut across a broad range.

- alignment of course content with four sets of professional standards
- special education faculty review of course objectives for overlap and update
- introduction/implementation of the ID process (generically: ADDIE for analysis, design, development, implementation, evaluation)
- helping discipline faculty revision traditional instructional strategies
- delivery system and media selection
- materials development with attention to the special needs of the BVI
- discipline faculty preparation to teach in these mediated instructional environments
- complete revision of student assessment and evaluation to a standards- and performance-based model
- creation of student and faculty support materials

Other issues that have surfaced are related to the administration and implementation of distance learning programs.

- faculty and student access to distance technologies is not yet ubiquitous
- importance of strong administrative support from the College of Education Dean
- project management requirements were underestimated (timelines, coordination, collaboration); the degree program is complex due to state licensure requirements; the participation of non-special education faculty requires additional time; other campus support systems (Academic Technology Services)
- facility design was required (WWW access stations; digital video development station; compressed video classroom)
- technical considerations at the development level and the end user level (e.g., Website compatibility with screen readers, software versions, Web browsers and their configuration; software downloads)
- remote student access to registration, library resources, textbooks, advising, financial aid, and other support services in a university environment unprepared for these requests.

Delivery Systems and Media

The project purposefully employs a wide variety of distance delivery systems and media. In particular instances, materials are developed in more than one media to allow all students (sighted and non-sighted) access. Though not a stated objective of the project, an unintended consequence has been that the students are increasing their use of and comfort with technology, in general. All members of the project team believe in the power of technology to meet learner needs and in the importance of better preparing teachers to effectively utilize technology with their students. For these students who will teach children who are BVI, Hardman's (1999) comment strikes a loud chord, "A technologically competent work force in the education industry is needed to continue to keep the promise of universal education: to leave behind no child who is willing to try" (p. 4). The project relies on the WWW, compressed video (CV), text (student handbooks and coursepacks), videotape (custom and commercial), CD-ROM (custom), a required campus component during one summer, computer video conferencing, synchronous and asynchronous communication via the Web, audioconferencing, and commercial satellite downlinks.

The discipline faculty felt strongly that the distance delivered program should be as student-centered as the campus program. The design and development process has consistently incorporated Sorg and Truman's (1997) recommendations for creating quality student-centered virtual classes. Their recommendations included personalizing instruction, humanizing the course pages, providing advance organizers, and assuring easy navigation between and among course topics.

Courses delivered to date include:

EDSE 540	Independent Living for Individuals with Visual Disabilities
EDSE 542	Assessment and Methods for Teaching Students with Visual/Multiple Disabilities
EDSE 543	Braille Codes and Formats
EDSE 544	Technology for Students with Visual Disabilities
EDSE 545	Advanced Braille Codes and Formats
EDSE 546	Principles of Orientation and Mobility
EDSE 641	Medical and Educational Implications of Visual Handicaps
EDSE 642	Advanced Seminar in Education of Students with Visual Handicaps
EDSE 643	Psychosocial Needs of Individuals with Visual Handicaps
EDSE 644	Practicum in Education of Students with Visual Impairments
EDSE 648	Practicum in Orientation and Mobility

Though multiple media and distance systems are used to deliver this program, the WWW has been chosen as a central learner and instructional resource for the redesign of each course (http://vision.unco.edu/). A standardized navigation shell was custom created so students do not feel "lost" each time they begin a new course in their program. Each course, however, relies to varying degree on the Web for the delivery of instruction. All courses have embedded syllabi, links to the four sets of discipline standards and course standards, course requirements, description of course activities, an asynchronous threaded discussion area, course schedule, and a place for additional resources that may or may not be Web-based. Each course also has a dedicated class listserv. Some of the course Websites include interactive custom-designed tutorials, synchronous discussion areas, samples of student projects, links to external assistive software, and multimedia authored graphics. The variety of technologies in use has increased as the discipline faculty has become more comfortable with trying new instructional strategies with remote students.

Remote students have access to several support systems that have proven invaluable to the satisfaction and success of the learners.

- Online Graduate School admissions application
- Student handbook for project participants (available in text and as a PDF file on the Web)
- Toll-Free phone into the Special Education Division office
- A Webmaster who responds to individual technical problems with near 24/7 response
- CD-ROM with Web browser and style sheet options to load on home computers
- Course enrollment and program enrollment listservs (subscribers include students, faculty, and the grant team)

Lessons Learned

- Facility design of distance education learning environments (DELEs) is expensive, time consuming, and requires substantial technical, pedagogical, and academic expertise related to distance delivery of instruction.
- ID and FD (facility design) need to evolve simultaneously for DELEs that utilize multiple delivery systems/media.
- Substantial advance planning and continual project management are critical to initiatives of this scope.
- Most of the distance delivery technologies today are visual technologies; consequently there is significant attention required to specialized design and development considerations for this project and for any other distance effort that strives for equal access for disabled learners.
- Faculty introduction to and training for using these technologies for instructional purposes is particularly important to project success, learner satisfaction, and continued faculty involvement.
- Meeting individual learner needs, faculty expectations, and content requirements are not mutually exclusive in the creation of a DELE, but the process is extremely complex.

Future Directions

Federal funding ends on December 31, 2000, and the staff have applied for additional funding to continue the project and keep up with changing technology. Our next steps include technical assistance regarding online course delivery to other universities with programs in visual impairment and blindness, as well as licensing of the courses for delivery at other universities.

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