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ABSTRACT

The Iowa Communications Network (ICN), a statewide full-motion interactive fiber-optic network for distance education, is nearing completion. Few innovations have had the potential impact of the ICN. This paper describes distance education in Iowa, the ICN, the Iowa Distance Education Alliance, the distance-education research plan underway in Iowa, and the process used to encourage researchers to conduct research. The Iowa Distance Education Alliance consists of 15 regional partnerships for program development, a clearinghouse for information related to interactive telecommunications, a project-management structure, and the Teacher Education Alliance. The Teacher Education Alliance, with its other activities, is developing a comprehensive plan for research and evaluation to determine the unique contributions of the Iowa approach to distance education. The ICN is a top-down innovation that must be accepted by teachers and the public. Education about its potential and uses must be a priority, and research studies must be distributed and publicized to support the professionalization of distance education. (Contains 2 references.) (SLD)

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Title:

Distance Education in Iowa: A Research Plan

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Two significant events are underway in Iowa. First, the Iowa Communications Network (ICN), a statewide, full-motion interactive fiber optic network, is nearing completion. The ICN is a 2800 mile system that connects sites in each of Iowa's 99 counties with a fiber optics network for distance education. The ICN is being funded entirely with state funds and is designed to enhance the educational opportunities available to students from Iowa's schools.

Second, a group of Iowa educational organizations prepared a proposal titled the Iowa Distance Education Alliance (IDEA), and in October 1992 received notification of funding from the US Department of Education's Star Schools Program. The IDEA's primary purpose is to infuse distance education into the schools and colleges of Iowa.

One component of the IDEA is to begin a comprehensive research plan that will investigate the use of the ICN and the activities of the IDEA. During 1993, twenty research studies were started. They are based on Rogers' (1983) Diffusion of Innovations Theory, and will provide a foundation for additional studies to be conducted in the future.

Few innovations have the potential impact that the ICN may have on Iowa education. The research plan of the IDEA will empirically examine the infusion of the innovation, "a statewide, full-motion interactive fiber optic network," and will provide information about the large scale adoption of distance education by an entire state.

PURPOSE

This paper describes distance education in Iowa, the Iowa Communications Network, The Iowa Distance Education Alliance, and the research plan underway in Iowa. Research and evaluation are central to the implementation of distance education in Iowa. The process used to rally educators to conduct research is explained.

DISTANCE EDUCATION IN IOWA: BACKGROUND

Iowa's approach to distance education is based on the belief that live, interactive instruction is fundamental to effective learning. Interaction is made possible by the Iowa Communications Network (ICN). The ICN is a statewide two-way full motion interactive fiber optic telecommunications network. It is designed to be used by teachers and students in learning situations where they not only can see and hear each other, but where they expect to see and hear each other. Distant and local students function together as a learning group. They learn from and with one another.

Key to Iowa's successful distance education system is the concept of sharing. Iowa's vision for distance education is being built around the development of partnerships of schools that share courses. For example, a physics class originating in Jefferson may have students in Sac City and Rockwell City, schools in two adjacent counties. French students in Sac City have distant classmates in Jefferson and Rockwell City, and a calculus class that originates in Rockwell City is shared with students in Sac City and Jefferson. All three schools provide courses to partner schools and receive instruction from neighbors. Classes are small with enrollments of 30-35 or less, and are taught by teachers prepared in the skills needed by distance educators.

Iowa's approach to distance education is based on several beliefs about education. The United States has historically been perceived as having the finest education system ever developed. Local control, small classes, rapport between teachers and students, and highly personalized instruction are hailed as important characteristics of this respected system. On the other hand, telecommunications-based education is often perceived as the antithesis to these attributes. Distance education and telecommunications create the image of a centralized curriculum, a single source of information, and large classes with little or no interaction between the teacher and students. Some feel that the traditional values of education and increased use of technology are incompatible with one another. Iowa educators are attempting to prove these critics are wrong.

Of the many projects of the last few years that have promoted the use of technology, few have been as successful as the US Department of Education's Star Schools Program. The Star Schools Program began in 1987 "to encourage improved instruction in mathematics, science, foreign languages, literacy skills, and vocational education for underserved populations through the use of telecommunications networks." Many star schools projects have used communications satellites to deliver courses to large numbers of students located in dozens of cities and states. In 1992, a new approach to distance education was recognized by the Star Schools Program when a proposal submitted by an alliance of educational organizations in the state of Iowa was funded.

Iowa's project demonstrates a distance education system that uses a statewide two-way full motion interactive fiber optic telecommunications network. The "Iowa Distance Education Alliance: Partnerships for Interactive Learning Through Telecommunications (IDEA)," the name of Iowa's Star Schools project, demonstrates that historically important characteristics of an effective educational environment can be combined with educational technology to bring the best of both to the student faced with the challenge of being a citizen of the 21st century. The use of fiber optic technology, because of its extensive capacities and flexibility, provides unique opportunities for augmenting the instructional process beyond what is possible using other distance delivery technologies. The IDEA demonstrates the use of a system that emphasizes:

- local control of the curriculum,
- active involvement by educators from local school districts,
- interactive instruction,
- statewide alliances and regional partnerships,
- preservice, inservice, and staff development activities,
- implementation using existing organizations and expertise, and
- research-based instructional decision making.

The Iowa Communications Network (ICN)

Central to the successful completion of the Iowa Distance Education Alliance project is the Iowa Communications Network (ICN; Figure 1). The ICN is a statewide two-way full motion interactive fiber-optic telecommunications network with at least one point of presence in each of Iowa's 99 counties. The ICN links colleges, universities and secondary schools throughout the state and was constructed entirely with state and local funds.

The plan for the ICN was completed and adopted by the Iowa legislature in 1987. Construction of the fiber optic backbone portion of the network was completed during 1993. The ICN will ultimately connect hundreds of schools, colleges, regional libraries, and

governmental agencies. In addition to the capability of transmitting up to 48 simultaneous video channels, the ICN will carries data and voice traffic, and as demand increases the system is easily expandable without the need for "opening the trench" to lay more fiber. The IDEA Star Schools initiative is developing and enhancing the human and technical resources necessary to make effective use of the ICN.

The Iowa Distance Education Alliance

Partnerships of Iowa educational organizations are implementing the goals and objectives of the Iowa Distance Education Alliance. Partnerships in Iowa are also referred to as alliances because they are a "joining for a common purpose," which is the appropriate infusion of live, two-way interactive telecommunications into the educational systems of the state of Iowa.

The Iowa Distance Education Alliance was formed as the result of a collaborative effort of teachers and administrators from local school districts, the Iowa Department of Education, Iowa Public Television, Iowa's community colleges, area education agencies, and public (regent) and independent colleges and universities, with support from teacher and administrator professional organizations and the state's K-12 school boards. This alliance of Iowa's educational organizations is responsible for completing the IDEA project.

Educational organizations participating in the Iowa Distance Education Alliance are organized into several components to ensure that the activities of the project are completed (Figure 2). First, 15 regional partnerships, organized in accordance with Iowa's merged area education structure, were formed. The state's 15 area community colleges and 15 area education agencies which share common boundaries are collaborating with teachers and administrators from local schools to plan for staff development, inservice activities, and course offerings. Classrooms have been equipped. Teachers have been trained. Curriculum materials are under development. Staff in-service activities were offered, and beginning Fall, 1993, courses began to be shared.

Second, a clearinghouse was established by the Iowa Department of Education. The clearinghouse provides quick and comprehensive access to information about interactive telecommunications, and it coordinates access for Iowa Distance Education Alliance partners to other computer and telecommunications networks, such as the Internet.

The third component of the project is the Teacher Education Alliance which is being coordinated by faculty from each of the state's three public universities working closely with teachers, teacher education faculty from the independent colleges and universities, and the area education agencies. The Teacher Education Alliance has developed a process for, and materials being used in, preservice and inservice teacher education experiences. Materials are being used to assist teachers in curriculum revision activities and to prepare them for instruction of students at a distance. Workshops have been held. Inservice sessions have been delivered, and curriculum plans for staff development are being made available. Finally, the staff of the Teacher Education Alliance developed and are completing a comprehensive plan for research and evaluation to determine the unique contributions of the Iowa approach to the theory and practice of distance education. Currently, twenty research studies are underway, and more are being planned.

The fourth component of the Iowa Distance Education Alliance is the project management structure which is coordinated by Iowa Public Television and the Iowa Department of

Education. The project manager's primary responsibilities are to administer the activities of the project and to interact for the alliance with organizations in Iowa and elsewhere.

Goals and Activities

The projects goals are listed in Figure #3. To accomplish these goals a number of activities were undertaken. Some of the more significant activities were:
1. During 1993, each of the 104 endpoints of the ICN were connected to a fully equipped distance education classroom.
2. During 1993, a public awareness program was planned and implemented that familiarized Iowa citizens with the concept of distance education, with the capabilities of the Iowa Communications Network, and with the purposes of the Iowa Distance Education Alliance.
3. The framework for sharing of distance education courses was developed.
4. Faculty from Iowa's colleges and universities collaborated to develop a curriculum implementation plan that is being used so that graduates of Iowa's teacher education programs are prepared to become distance education teachers.
5. During the Spring and Summer of 1993, hundreds of Iowa teachers were prepared to teach using the ICN.
6. Faculty from Iowa's universities and colleges collaborated with representatives from the state's area education agencies to ensure that distance education courses reflected current thinking and reform efforts in science, mathematics, foreign language, vocational education, and literacy education.
7. a comprehensive research plan based on the principles of diffusion of innovations was formulated and begun. This plan identified a number of action-research projects that dealt with local concerns in addition to studies that investigated more fundamental distance education issues.

Finally, the partners of the Iowa Distance Education Alliance established in Iowa the framework for the infusion of the principles and practices of distance education throughout the state. The Iowa Distance Education Alliance is a model for other states and regions that plan the large scale implementation of a distance education system that is based on the concept of local control of courses offered using live two-way interactive telecommunications.

THE RESEARCH SITUATION

The feelings in Iowa related to distance education have traditionally been volatile, and this presents the opportunity for many research studies. Specifically, the situation in Iowa is characterized by the following.

1. The ICN was planned for the educational community of Iowa by state government, most notably the administrative and legislative branches. No consensus of acceptance was sought from or given by Iowa's educators. In other words, the ICN is a top-down innovation that was built and now is available to Iowa educators.

2. Only a small percentage of Iowa educators and Iowa citizens clearly understand distance education and the ICN, but most are aware that the state is spending over $100 million to construct the ICN.

3. Many educators and citizens are skeptical of the concept of distance education, and

opposed the construction of the ICN.

4. Distance education has gained acceptance as a discrete category of education.

5. Fiber optics communication is the most effective transmission method for live, two way, full motion interactive telecommunication, even though it is not the only effective transmission method, or the most cost effective transmission method. In Iowa, fiber optics has been mandated by the legislature as the primary medium for distance education.

6. Most teachers are not familiar with the techniques of the distant educator, or the needs of the distant learner.

7. Distance education research is emerging, is largely anecdotal, is not empirically based, and usually is reported as individual studies with little or no relationship to an ongoing, large-scale research plan.

8. Theories of distance education have been proposed and are beginning to gain acceptance.

9. Rogers' Diffusion of Innovations Theory, one of several theories that provide a foundation for research in distance education, is considered an appropriate guide for a large-scale research agenda such as the diffusion of distance education in Iowa.

The Research Plan

First, a group of Iowa educators was identified to serve as a research and evaluation advisory panel (REAP). This group developed the plan for soliciting research proposals from those interested in investigating the distance education situation in Iowa. A Request for Proposals (RFP) process was used (Appendix 1). This RFP was sent to over 1000 Iowa educators from a cross section of academic disciplines and organizations. The RFP process was conducted in four phases. After each phase, proposals were reviewed by the REAP who provided authors of the proposals with suggestions for improving their studies. In some cases proposals were revised and resubmitted, based on suggestions made by the REAP. At the conclusion of the RFP process, twenty studies were selected for funding (Appendix 2).

Next, a comprehensive review of the distance education literature was commissioned. This document (Schlosser and Anderson, 1994), was published by the Association for Educational Communications and Technology, and included current information on the theories, research, and critical issues of distance education. This monograph was distributed to the researchers whose proposals were selected for funding to assist them in their research efforts. This monograph also is used to provide consistency among the research studies.

Late in 1993, the RFP process was concluded. In order to complete the research agenda and to fill gaps in coverage, additional studies were solicited from researchers. Two examples of new studies include a Delphi study that will attempt to develop a vision statement for how distance education in Iowa should evolve, and a study that will review and summarize the characteristics of the distance education classrooms connected to the ICN. This summary will include a photograph of the classroom, a summary of the classroom's capabilities, and a rating of the classroom's utility as a distant learning site. Finally, a synthesis of the most effective features of classrooms will be developed and a model classroom will be proposed.

Next, summaries of the funded research studies are being published widely. This is to

inform Iowa educators of the scope of the project's research plan. As studies are completed they will be published as monographs and distributed to those who are interested. Finally, an Encyclopedia of Distance Education Research in Iowa will be published. The Encyclopedia will be published late in 1994 and will include the entire research agenda of the Iowa Distance Education Alliance project including:

- the research, theory, and issues monograph,
- the final reports of the project's research studies,
- a review of the project's research plan, and
- a summary of the findings of the research activities of the project.

CONCLUSION

"Finally, the most fundamental and most important characteristic of a profession is that the skills involved are founded upon a body of intellectual theory and research. Furthermore, this systematic theory is constantly being expanded by research and thinking within the profession . . . the practice of a profession cannot be disjoined from its theoretical understanding and vice versa . . . The antithesis to a profession is an avocation based upon customary activities and modified by the trial and error of individual practice. Such an avocation is a craft. . . The difference between the bricklayer and the architect lies right here." (Finn, 1953, p. 9.)

In Iowa, every attempt is being made to insure that the practice of distance education is based on theory supported by research. The results of the research plan described above will support the professionalization of distance education in Iowa, and nationwide.

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Finn, J. (1953). Professionalizing the audiovisual field. Audio-Visual Communications Review, 1(1), 6-17.

Schlosser, C. & Anderson, M. (1994). Distance education: Review of the literature. Washington, D.C.: Association for Educational Communications and Technology.

Appendix #1: Request for Proposals and Review Criteria

Appendix #2: Research in Progress - Annotated Listing