DISTANCE EDUCATION AND INTERACTIVE TECHNOLOGY

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ABSTRACT

Systems, which supported interactivity, and were expanded to allow the discussion of related issues, could generate a satisfactory learning environment (De Vries 1996). De Vries continued by stating that effective distance education could be achieved when the students have "personal involvement". This paper deals with the reasons for providing an interactive environment in the distance education setting and studies related to interactivity issues in graduate schools.

Salmon (2002) stated that "learners need to be led through a structured developmental cycle for online learning to be successful and happy". Jones (1995) researched the usage of interactive-intercampus telecommunication systems connected through a compressed-video network in Alabama that was used in distance education. Jones concluded his study by stating that technology seemed to be effective and adaptable in providing teachers with better approaches to instruction.

1. DEFINITION OF DISTANCE EDUCATION

There are many definitions regarding the term of distance education, involving the educational access, closely related to the information technology and communication infrastructure.

The California Distance Learning Project's definition is: "Distance Learning (DL) is an instructional delivery system which connects learners with educational resources. DL provides educational access to learners not enrolled in educational institutions and can augment the learning opportunities of current students. The implementation of DL is a process which uses available resources and will evolve to incorporate emerging technologies."

As defined by Michael Moore, then director of The American Center for the Study of Distance Education, Penn State: "Distance education is planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technology, as well as special organizational and administrative arrangements".

The ITC (*Instructional Telecommunications Council*) definition is: "The process of extending learning, or delivering instructional resource-sharing opportunities, to locations away from a classroom, building or site, to another classroom, building or site by using video, audio, computer, multimedia communications, or some combination of these with other traditional delivery methods."

Distance education became significant because of if its divergence from the common centralized school model by bringing the school to the student instead of sending the student to the school. Distance education became successful because it filled a need generated by an increasing number of nontraditional students. The potential audience for distance education is much more varied and much larger than any educational establishment estimated.

In the history of distance education there was different approaching levels, such as:

- *Correspondence Education*

Distance education is not a new phenomenon; it has been a mode of teaching and learning for countless individuals for at least a hundred years (Moore & Kearsley, 1996). Before the widespread use of electronic communications, educators used print technology, and the postal service for what became known as correspondence education.

- *Educational Radio*

With the advent of broadcasting, the federal government issued the first educational radio license to the Latter Day Saints' University of Salt Lake City, in 1921. The University of Wisconsin and the University of Minnesota also received licenses to establish educational radio stations in 1922. (Saettler, 1990). Levenson (1945) listed a series of evaluation studies conducted by Ohio State University and The University of Wisconsin as early as 1931 to demonstrate the effectiveness of radio in learning. The number of studies listed and the variety of research questions are indicative of the ubiquity and popularity of the use of radio in education. For example, research questions ranged from the "relative effectiveness of short and long sentences," to "the value of repetition in the presentation of different types of material" to development of new instrument of evaluation.

- *Educational Television*

Iowa State University applied to the Federal Communication Commission (FCC) for an educational television (ETV) license in 1945, and became the first ETV broadcaster in the world, as it commenced televising educational programs in 1950. (Saettler, 1990). Since the mid-1980's the attention shifted to the use of computer networks for teaching and learning. As the National Science Foundation (NSF) provided access for universities to the Internet, educators gained a powerful means for teaching and learning, which was radically different with previous electronic media. Arrival of networked computing to higher education, the place of work, K-12 schools, and even homes did not come a moment too soon, since towards the late 1980's, and in early 1990's families, institutions, societies, and relations among nations were going through rapid change. Novel solutions were required to meet the demands of the changing social institutions.

- *Approaching the 21st Century*

In the 21st Century, a synergy among technologies has brought unprecedented added value to the products of many companies, and have reduced the cost of production and distribution of goods and services due to an fundamental change of the economy, as the world economy is becoming more reliant on knowledge bases for increased productivity.

Such a far-reaching transformation, according to Alvin Toffler, has happened only once before in human history, when the world economy transformed from an agricultural-based system into an industrial one. A similar change is occurring now, as the world economy is evolving to a new level of activities, the information economy. The emergence of the knowledge economy has had a dual effect on higher education:

- First, information technology has deeply impacted teaching, learning and managing practices. An evidence of this is the establishment of virtual universities and rapid expansion of distance;
- Second, businesses, industries, and even major farmers see themselves as knowledge generators and disseminators; thus, ending the semi-monopoly of higher education over creation and dissemination of new knowledge.education practices during 1997 throughout the country.

Today, higher education is a necessity for those who wish to work and prosper in an economy based on information manipulation, that is becoming dependant not on sheer muscle power, but on brainpower. Today, the workforce is rewarded for how well and how fast problems are detected and solved.

2. LINK OF TECHNOLOGY WITH DISTANCE EDUCATION

This section deals with the issue of how technology has impacted distance education. Gates stated that people might fear that technology would "dehumanize" education. He added that if people could watch students living in different countries and exchanging information across the borders, they might rethink that technology would actually "humanize" education. Gates continued by stating "the same technological forces that will make learning so necessary will also make it practical and enjoyable. Corporations are reinventing themselves around the flexible opportunities afforded by information technology; classrooms will have to change as well."[Gates1995]

2.1. Quality Education at a Distance

The society is changing rapidly, and as educators we need to be sensitive to these changes and respond to them in a measured and thoughtful manner. As such the rules for quality education at a distance are not very different from those that work in a classroom.

Since quality education is a concept that varies among individuals, it is hard to agree on a definition of quality in education. Aldag and Stearns (1991) suggest that quality is what a consumer wants from products and services and is willing to invest in. Moore and Kearsely (1996) discussed "quality assessment" as an important factor in the process of managing a distance education project. The authors stated that a distance education project should be assessed based on several factors. These include "quality of application and enrollment, student achievement, student satisfaction, faculty satisfaction, program or institutional reputation, and quality of course materials. Each of these factors reflect different aspects of quality".

The most important factor for quality distance education is advanced planning. In distance education strategic planning is not an option but a necessity. The planning process can be summarized in a five-step model:

- Analyzing the needs of the learner
- Designing instruction based on students' learning needs
- Developing instructional materials
- Implementing instructional sessions
- Evaluating the results systematically.

A genaral model for distance education:

- Must respond to the real needs of learners. As such, distance education is learner-centered.
- Includes teaching and learning strategies, and activities that are based on the analysis of the subject matter at hand.
- Must specify teaching and learning strategies and activities in terms of cognitive and behavioral skills the learners need to acquire in order to master the subject matter.
- Must specify teaching and learning strategies and activities in a context familiar to students in order to maximize its affective appeal and motivation to learn.
- May be complex, but not complicated to implement, if students are scattered in a wide geographic area. Provisions for local library access, monitored tests and exams, and access to health-care must be provided.

3. DISTANCE EDUCATION AND INTERACTIVITY

De Vries stated that systems, which support interactivity between students and instructor, could generate a satisfactory learning environment. Schwier (1994) discussed the reasons for including the interactivity factor in distance education projects. These reasons include [De Vries1996]:

- finding different methods of accessing the materials;
- requiring interactive media analysis;
- producing stronger learning environments, since multiple media can be combined;

- increasing student retention rates;
- creating an independent study environment;
- providing instant access to information;
- ensuring a less hostile learning environment;
- improving record keeping and
- reducing costs.

Systems, which supported interactivity, and were expanded to allow the discussion of related issues, could generate a satisfactory learning environment [De Vries1996]. De Vries continued by stating that effective distance education could be achieved when the students have "personal involvement." This section deals with the reasons for providing an interactive environment in the distance education setting and studies related to interactivity issues in graduate schools.

Salmon stated that "learners need to be led through a structured developmental cycle for online learning to be successful and happy" [Salmon2002]. Jones researched the usage of interactive-intercampus telecommunication systems connected through a compressed-video network in Alabama that was used in distance education. Jones concluded his study by stating that technology seemed to be effective and adaptable in providing teachers with better approaches to instruction [Jones1995].

3.1. Technology, Delivery Systems for Distance Education

This section discusses the electronic devices, and the delivery methods used in distance education. McLean stated that by using technological innovation, classrooms around the globe could be connected through satellite, computers, interactive TV, and the Internet. Brennan stated that telecommunication could provide new links between the learners and the instructor. The author added that the term "interactivity" is associated with the field of telecommunication [McLean1996].

Distance education has gained tremendous recognition for its ability to accept and use new educational technologies, while traditional education has been resistant to change and is not structured to make complete use of the new developments. The computer-based technologies now available for use in educational programs provide current and quality instructional options for teachers and students [Steele1993].

The development of videodisc and laser technology provided several unique features: ability to store large amounts of data, ability to display still images indefinitely without wear to the disc, and the ability to access any frame within micro-seconds. The almost instantaneous frame access and massive still storage ability make the videodisc a uniquely ideal visual storage format that can be used by educators and can easily be controlled by computers, providing an interactive media useful in all forms of education.

Computer-based approaches to education can enhance almost all other forms of distance education. The ability of computer technology to interface with and control other technologies has placed it in the forefront of all technologies as the greatest proponent of change in the educational environment.

The computer is just a tool, abate a very powerful one, that is available for educators in their pursuit to create an educational environment in which learning will take place.

The definition of computer-mediated communication appears to parallel the definition of distance education in that it often removes the teacher from the student in time and location. Computer technologies have caused tremendous advancements in information storage and retrieval sciences that are combined with electronic communications to produce tremendous educational tools: internets, telecommunication, electronic bulletin boards, electronic mail, video conferences, and many others [Brude1991].

Lucio Teles who surveyed 32 online instructors from United States, Mexico, Canada, Netherlands, Greece, Colombia, Australia, South Africa, the United Kingdom, and Spain stated that instructors preferred instructional tools that are intuitive and require less time to learn. Further, a variety of distance learning methods does exist [Teles2002]. These approaches range from traditional correspondence courses to real time interactive videoconferencing.

In delivering distance education, the varieties of modes include print, e-mail and facsimile, video conferencing, interactive video technology, audio graphics, teleconferencing and audio conferencing, and the Internet.

4. TRENDS IN DISTANCE EDUCATION

Distance education and advancing technologies are changing the relationships between institutes of higher learning. Just two decades ago, very few states promoted distance education, while today virtually all states have distance education programs and are promoting the use of computer-based communications for information transmission and interaction.

As these new relationships develop and higher education institutes adapt to changes in educational technologies they are evolving new technological infrastructures that define the new environment. A new mainstream is developing in which the mission of higher education institutions is being defined more by the professional communities they serve than by their immediate geographic community. As distance education and traditional education converge through the use of computer-based communication technologies, students are being recognized as consumers of information that need access to that information no matter where in the world it is located.

Self-motivated students will thrive in an environment that provides access to any amount of information they desire.

5. CONCLUSION

Educators can define and design effective and robust teaching and learning systems that would be responsive to the needs of student community's close and afar.

There are some observations emerging from distance education projects:

1. A distance education project is a valid and appropriate method for delivering quality distance education.
2. There exists a relationship between interactivity and students' progress in the distance education course.
3. There exists a relationship between the adequacy of the communication mode and the level of interactivity.
4. There exists a relationship between the level of interactivity and the desire to take another distance education course.

Distance education technology is evolving and exponential gains in technology continue to create increasing opportunities for innovation. Therefore, what is current today is obsolete tomorrow. To that end, there is a need for a conceptual model that withstands the changes in technology, economy, and the environment.

Today, distance education is trying to imitate the classroom. In few instances, such as Sesame Street, where educators and media specialists experimented with forms native to distance education results have been spectacular. This generation of faculty can be designers of a unique effective and quality-driven form of teaching and learning. In many instances, it will resemble classroom instruction. In other instances it will be very different.

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