Theory and Distance Education: A New Discussion

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Abstract

Theories guide the practice and research of distance education. Traditionally, theories of distance education have been derived from classical European or American models based on correspondence study. Recently, telecommunications systems have significantly altered the practice of distance education in the United States and have produced a uniquely American approach to this field. This has created the need for a new theory to guide the practice of distance education. This theory, called Equivalency Theory, is described and compared to the historical theories of distance education.

> Theory helps us bear our ignorance of fact.
> G. Santayana, *The Sense of Beauty*

Introduction

Many cringe at the thought of a discussion of theory. This need not be the case. Theory is important to the study of distance education because it directly affects the practice of the field. Traditionally, theories of distance education have come from sources external to America. Recently, though, the field of distance education in the United States has matured to the point where indigenous definitions and theories have begun to emerge, most notably, theories based on the American system of education. Local control, classroom teachers, small classes, rapport between teacher and students, and highly personalized instruction are important characteristics of the American system of education. As advanced communications technologies become available, many educators have begun to advocate the need for forms of distance education that retain tradition al aspects of American education while taking advantage of the opportunities offered by telecommunications systems.

This paper will discuss both the need for theory and several tradition al theoretical approaches that have influenced the field. A distance education theory based on the American practice of education will be presented. The paper's purpose is to provide a summary and synthesis of the significant theories supporting the practice of distance education and to propose a new, uniquely American theory of distance education.

The Need for Theory

Although various forms of distance education have existed since the 1840s and attempts at theoretical

explanations of distance education have been undertaken for decades by leading scholars in the field, the need for a theory of distance education has been largely unfulfilled until recently. Holmberg (1986) stated that theoretical considerations give distance educators a touchstone against which decisions can be made with confidence. In 1988, Holmberg reiterated the need for theory, stating that,

> One consequence of such understanding and explanation will be that hypotheses can be developed and submitted to falsification attempts. This will lead to insights telling us what in distance education is to be expected under what conditions and circumstances, thus paving the way for corroborated practical methodological application. (p. 3)

As early as 1972, Moore expressed concern about the progress of distance education being hindered by lack of attention to what he called the 'macro factors'. Moore indicated that there is a need to describe and define the field of distance education, to discriminate between its various components, and to identify the critical elements of the various forms of learning and teaching.

Keegan (1995) reaffirmed the continued need for a theory of distance education by stating that a firmly based theory of distance education is one that can provide the touchstone against which , financial, educational, and social can be made with confidence.. Theory would thus cease to be an ad hoc response to a set of conditions arising in crisis situations of problem-solving, characteristic of the field of education.

In a general sense, theory is taken to mean a set of hypotheses logically related to one another for explaining and predicting occurrences. Holmberg (1985) stated that,

> the aim of the theoretician is to find explanatory theories; that is to say, the theories which describe certain structural properties of the world, and which permit us to deduce, with the help of initial conditions, the effects to be explained. (p. 5)

Holmberg (1995, 4) further defined theory as, "a systematic ordering of ideas about the phenomenon of a field of inquiry, and an over-arching logical structure of reasoned suppositions which can generate testable hypotheses." He suggested that distance education has been characterized by a trial and error approach, with little consideration given to a theoretical basis for decision-making, and that the theoretical underpinnings of distance education are fragile. Most efforts in this field have been practical or mechanical and have concentrated on the logistics of the enterprise.

Holmberg and Keegan (1986) both consider distance education as representing a distinct form of education, the latter concluding that it is parallel to and a complement of conventional education. However, Shale (1988) countered that all that constitutes the process of education when teacher and student are able to meet face-to-face also constitutes the process of education when teacher and student are physically separated.

In his landmark work, *The Foundations of Distance Education* (1986), Keegan classified theories of

distance education into three groups: theories of independence and autonomy, theories of industrialization of teaching, and theories of interaction and communication. A fourth category seeks to explain distance education through a synthesis of existing theories of communication and diffusion as well as philosophies of education. Each of these major categories will be discussed in the following sections.

Theories of Independence and Autonomy

American Theory of Independent Study. Wedemeyer, a professor from the University of Wisconsin, considered the independence of the student as the essence of distance education (Keegan 1986). This was reflected in Wedemeyer's preference for the term "independent study" for distance education at the college or university level. He was critical of contemporary patterns of higher education, believing that outdated concepts of learning and teaching were being employed. Wedemeyer felt that these concepts failed to utilize modern technologies in ways that could alter an institution. He set forth a system of distance education that includes ten characteristics which emphasize learner independence and the adoption of technology as a way of implementing it. According to Wedemeyer, the system should:

1. Be capable of operating any place where there are students---even only one student------twhether or not there are teachers at the same place, at the same time;
2. Place greater responsibility for learning on the student;
3. Free faculty members from custodial-type duties so that more time can be given to truly educational tasks;
4. Offer students and adults wider choices (more opportunities) in courses, formats, and methodologies;
5. Use, as appropriate, all the teaching media and methods proven effective;
6. Mix and combine media and methods so that each subject or unit within a subject is taught in the best way known;
7. Cause the redesign and development of courses to fit into an articulated media program;
8. Preserve and enhance opportunities for adaptation to individual differences;
9. Evaluate student achievement simply, not by raising barriers regarding the place, rate, method, or sequence of student study; and
10. Permit students to start, stop, and learn at their own pace.

Wedemeyer proposed the separation of teaching from learning as a way to break education's "space-time barriers." He suggested six characteristics of independent study systems:

1. The student and teacher are separated.
2. The normal processes of teaching and learning are carried out in writing or through some other medium.
3. Teaching is individualized.
4. Learning takes place through the student's activity.
5. Learning is made convenient for the student in the student's own environment.
6. The learner takes responsibility for the pace of learning, with freedom to start and stop at any

time.

Wedemeyer noted four common elements of every teaching-learning situation: a teacher, a learner or learners, a communications system or mode, and something to be taught or learned. He proposed a reorganization of these elements that would accommodate physical space and allow for greater learner freedom. Wedemeyer believed that the development of the student-teacher relationship was key to the success of distance education. Wedemeyer's approach is a classical and American application of correspondence study to distance education.

European Theory of Independent Study. Formulated in the early 1970s, Moore's theory of distance education is a classification method for distance education programs. Shaped in part by Moore's adult education and university extension experience, it examines two variables in educational programs: the amount of learner autonomy and the distance between teacher and learner.

For Moore (1994), distance education is composed of two elements, each of which can be measured. The first element is the provision for two-way communication (dialog); some systems or programs offer greater amounts of two-way communication than others. The second element is the extent to which a program is responsive to the needs of the individual learner (structure); some programs are very structured while others are more responsive to the needs and goals of the individual student.

In the second part of his theory, Moore addresses learner autonomy. He notes that in traditional school settings learners are very dependent on teachers for guidance and that in most programs, conventional and distance, the teacher is active while the student is passive. In distance education, there is a gap between teacher and student, so the student must accept a high degree of responsibility for the conduct of the learning program. The autonomous learner needs little help from the teacher, who may be more of a respondent than a director. Some adult learners, however, require help in formulating their learning objectives, identifying sources of information, and measuring objectives.

Moore classifies distance education programs as "autonomous" (learner-determined) or "non-autonomous" (teacher-determined) and gauges the degree of autonomy accorded the learner by answering the following three questions:

- Is the selection of learning objectives in the program the responsibility of the learner or the teacher (autonomy in setting objectives)?
- Is the selection and use of resource persons---of bodies and other media---ted decision of the learner or the teacher (autonomy in methods of study)?
- Are the decisions about the method of evaluation and criteria to be used made by the learner or the teacher (autonomy in evaluation)?

For Moore, the answers to these questions determine the type of distance learning program. This information can be used to categorize the program and even provide direction as to how the program functions.

Theory of Industrialization of Teaching

After examining a research base that included an extensive analysis of the European distance teaching organizations of the 1960s, Peters (1988) proposed that distance education could be analyzed by comparison with the industrial production of goods. Peters stated that from many points of view, conventional, oral, group-based education was a pre-industrial form of education, implying that distance teaching could not have existed before the industrial era. Based on economic and industrial theory, Peters proposed the following new categories (terminology) for the analysis of distance education:

- Rationalization: the use of methodical measures to reduce the required amount of input of power, time, and money.
- Division of labor: the division of a task into simpler components or subtasks.
- Mechanization: the use of machines in a work process. Peters noted that distance education would be impossible without machines.
- Assembly line: a method of work in which workers remain station ary while objects they are working on move past them. In traditional distance education programs, materials for both teacher and student are not the product of one individual.
- Mass production: the production of goods in large quantities. Because demand outstrips supply at colleges and universities, there has been a trend toward large-scale operations.
- Preparatory work: determining how workers, machines, and materials can usefully relate to each other during each phase of the production process. The success of distance education depends on a preparatory phase.
- Planning: the system of decisions that determines an operation prior to its being carried out.
- Organization: creating general or permanent arrangements for purpose-oriented activity. Organization makes it possible for students to receive predetermined instructional units at appointed times.
- Scientific control methods: methods by which work processes are analyzed systematically, particularly by time studies, and in accordance with the results obtained from measurements and empirical data.
- Formalization: the predetermination of the phases of the manufacturing process. In distance education, all the points in the cycle must be determined exactly.
- Standardization: the limitations of manufacture to a restricted number of types of one product to make these more suitable for their purpose, cheaper to produce, and easier to replace.
- Change of function: the change of the role or job of the worker in the production process. The original role of knowledge provider as lecturer is divided into those of study unit author and marker.
- Objectification: the loss, in the production process, of the subjective element that had previously determined work to a considerable degree. In distance education most teaching functions are objectified.
- Concentration and centralization: because of the large amount of capital required for mass production and the division of labor, there has been a movement toward large industrial concerns with a concentration of capital, a centralized administration, and a market that is monopolized.

Peters concluded that for distance teaching to be effective, the principle of division of labor is a critical element. In his theory of industrialization, the teaching process is gradually restructured through increased mechanization and automation. Peters noted the following:

- The development of distance study courses is just as important as the preparatory work that takes place prior to the production process.
- The effectiveness of the teaching process is particularly dependent on planning and organization.
- Courses must be formalized and expectations from students standardized.
- The teaching process is largely objectified.
- The function of academics teaching at a distance has changed considerably vis@vis university teachers in conventional teaching.
- Distance study can only be economical with a concentration of the available resources and a centralized administration.

According to Peters, when decisions about the process of teaching and learning are made, the industrial structures characteristic of distance teaching should be taken into account.

Holmberg noted that while this was admittedly an incomplete theory, it was not devoid of explanatory power; it did, in fact, indicate essential characteristics of effective distance education.

In 1995, Holmberg significantly broadened his theory of distance education. This comprehensive theory is divided into a number of parts encompassing the theory just stated previously and the belief that distance education serves diverse, individual learners who cannot or do not want to make use of face-to-face teaching. Distance education thus promotes students' independence and freedom of choice. Society benefits from distance education's provision of, on the one hand, liberal study opportunities for individual learners, and, on the other, professional/occupational training. Distance education is an instrument for recurrent and lifelong learning and for free access to learning opportunities and equity. According to Holmberg, distance education is characterized by the following statements:

- All learning concerned with the acquisition of cognitive knowledge and cognitive skills, as well as affective learning and some psychomotor learning, is effectively provided for by distance education.
- Distance education is based on learning as an individual activity. Learning is guided and supported by noncontiguous means.
- Distance education is open to behaviorist, cognitive, constructivist, and other modes of learning.
- Personal relations, study pleasure, and empathy between students and those supporting them (tutors, counselors) are central to learning in distance education. Feelings of empathy and belonging promote students' motivation to learn, influencing learning favorably.
- While it is an effective mode of training, distance education runs the risk of leading to mere fact learning and reproduction of accepted 'truths'. However, it can be organized and carried out in such a way that students are encouraged to search, criticize, and identify positions of their own.

On one level, Holmberg's expanded theory represents a description of distance education. On a deeper level, it is a theory from which hypotheses are generated and that has explanatory power by identifying a general approach favorable to learning and to the teaching efforts conducive to learning.

A Synthesis of Existing Theories

Perraton's (1988) theory of distance education is composed of elements from existing theories of communication and diffusion as well as philosophies of education. It is expressed in the form of fourteen statements, or hypotheses. The first five of these statements deal with the way in which distance teaching can be used to maximize education:

- You can use any medium to teach anything.
- Distance teaching can break the integuments of fixed staffing ratios that limit the expansion of education when teacher and student are in the same place at the same time.
- There are circumstances under which distance teaching can be cheaper than orthodox education, whether measured in terms of audience reached or of learning.
- The economies achievable by distance education are functions of the level of education, size of audience, choice of media, and sophistication of production.
- Distance teaching can reach audiences not reached by ordinary means.

The following four statements address the need to increase dialog:

- It is possible to organize distance teaching in such a way that there is dialog.
- When a tutor meets distance students face-to-face, the tutor's role changes from that of communicator of information to facilitator of learning.
- Group discussion is an effective method of distance learning to bring relevant information to the group.
- In most communities there are resources that can be used to support distance learning to its educational and economic advantage.

Perraton's final five statements deal with method:

- A multimedia program is likely to be more effective than one which relies on a single medium.
- A systems approach is helpful in planning distance education.
- Feedback is a necessary part of a distance learning system.
- To be effective, distance teaching materials should ensure that Students undertake frequent and regular activities over and above reading, watching, or listening.
- In choosing between media, the key decision on which the rest depend concerns the use of face-to-face learning.

Perraton's fourteen statements characterize his theory, which is actually a synthesis of information drawn from many sources.

Equivalency Theory

The impact of new telecommunications technologies on distance education is far-reaching. Real-time television systems, such as the Iowa Communications Network (Simonson and Schlosser 1995), permit learners and instructors to see and be seen, hear and be heard, in almost the same way as in the local classroom. Keegan (1995) suggested that electronically linking instructor and students at various locations creates a virtual classroom. He continued by saying that,

> The theoretical analyses of virtual education, however, have not yet been addressed by the literature: Is virtual education (interactive, live televised instruction) a subset of distance education or to be regarded as a separate field of educational endeavor? (p. 18)

Education at a distance should be built on the concept of equivalency of learning experiences. The more equivalent the learning experiences of distant learners are to those of local learners, the more equivalent will be the outcomes of the educational experiences for all learners. This approach to distance education advocates designing a collection of equivalent learning experiences for distant and local learners, even though they may be different for each student. The objective of the nstructional designer of distance education is to provide for appropriate, equivalent learning experiences for each student. This theory is based on the following definition of distance education as,

> formal, institutionally-based educational activities where the learner and teacher are separated from one another, and where two-way interactive telecommunication systems are used to synchronously and asynchronously connect them for the sharing of video, voice, and data-based instruction. (Simonson 1995)

In elaborating on this theory, Simonson (I 995) states that it should not be necessary for any group of learners to compensate for different, possibly lesser, instructional learning experiences. Students should have learning experiences that are tailored to the environment and situation in which they find themselves. Thus, those developing distance education systems should strive for equivalency in the learning experiences of all students, regardless of how they are linked to the resources or the instruction they require. There are several key elements to Equivalency Theory; they are the concepts of equivalency, learning experiences, appropriate application, students, and outcomes.

Equivalency. Central to this theoretical approach is the concept of equivalency. Local and distant learners have fundamentally different environments in which to learn. It is the responsibility of the distance educator to design learning events that provide experiences with equal value for learners. Just as a triangle and a square may have the same area and be considered equivalent even though they are different geometrical shapes, the experiences of the local learner and the distant learner should have equivalent value even though these experiences might be very different.

Learning Experience. Second in importance is the concept of learning experience. A learning experience

is anything that happens to the student to promote learning, including what is observed, felt, heard, or done. It is likely that different students in various locations, learning at different times, may require a different mix of learning experiences. Some may need a greater amount of observing while others require a larger dosage of doing. The goal of instructional planning is to make the sum of experiences for each learner equivalent. Instructional design procedures should attempt to anticipate and provide the collection of experiences that will be most suitable for each student or group of students. For example, if library resources are important to a course or unit, then library resources should be available. This does not mean that distant learners in a university research course will need access to a modern research library. It does mean that the educational equivalent of the resources of the library should be as readily available to the distant learner as they are to the local learner, whether electronically, through collaborative agreements with local libraries, or through the delivery of library resources to the distant student.

Appropriate Application. The idea of appropriate application implies that learning experiences suitable to the needs of the individual learner and the learning situation should be available and that the availability of learning experiences should be proper and timely. In other words, learning experiences that are made available to either distant or local learners should allow delivery of instructional ideas that fit the expectations and facilities available to them; desktop video conferencing should not be expected of learners accessing Web-based information by modem. Simiarly, collaborative learning strategies are not appropriate when an individual learner is isolated unless an equivalent, technology-based collaboration is arranged.

Students. Students are the ones involved in the formal, institutionally based learning activity---the course or unit of instruction. Students should be defined by their enrollment in a course, not by their location. They necessarily seek institutionally-based education, sanctioned by a recognized and accredited organization.

Outcomes. Finally, the outcomes of a learning experience are those obvious, measurable, and significant changes that occur cognitively and effectively in learners because of their participation in the course or unit. Outcomes consist of at least two categories: those that are instructor determined and those determined by learners. Instructor-determined outcomes are usually stated as course goals and objectives and identify what learners should be able to accomplish after the learning experience that they could not accomplish prior to participating in it. Learner-determined outcomes are less specific, more personal, and relate to what the learner hopes to accomplish as a result of participation. Equivalent learner-determined outcomes are identified when students enroll in follow-up courses or apply newly learned skills to job or course situations.

Once again, the concept of equivalency is central to the widespread acceptance of distance education. If teachers, learners, and the public in general identify learning at a distance as the equivalent of what they consider to be traditional learning, then distance learning will become mainstream, at least in America. If equivalency is not what the public perceives, then distance education will continue to be peripheral to the field of education.

The equivalency approach is generally supported by Shale (1988), who argued that distance education is not a distinct field of education. Keegan (1995) supports this idea, stating that,

> This new approach to distance education based on virtual classrooms requires a substantially different theory upon which to base practice than the traditional view of distance education as it has been practiced in the past. The study of virtual and electronic classrooms is an important and complex field, still in its beginnings, with a unique contribution to make to educational knowledge. (p. 19)

The equivalency approach is uniquely American. It is based on core values held almost sacred in American education, such as the use of regular classroom teachers to facilitate the teaching and learning process, local control, small class size, rapport between teacher and learner, and personalized learning. Most importantly, equivalent distant learning relies heavily on the use of modem and powerful interactive telecommunications systems to be successful.

Evaluating Theories

Keegan (1986) suggested that the theoretician had to answer three questions before developing a theory of distance education: Is distance education an educational activity? Is distance education a form of conventional education? and Is distance education possible, or is it a contradiction in terms?

Is distance education an educational activity? Keegan answered that while distance education institutions possess some of the characteristics of businesses rather than of traditional schools, their educational activities are dominant. Distance education is a more industrialized form of education. Keegan pointed out that the theoretical bases for distance education were within general education theory.

Is distance education a form of conventional education? Keegan stated that because distance education is not based on interpersonal communication and is characterized by a privatization of institutional ized learning (as is conventional education), it is a distinct form of education. Therefore, while the theoretical basis for distance education can be found within general education theory, it cannot be found within the theoretical structures of oral, group-based education. However, Keegan stated that virtual systems based on teaching face-to-face at a distance constituted a new field of study. He indicated that a theoretical analysis of virtual education still needs to be addressed.

Is distance education possible, or is it a contradiction in terms? Keegan points out that if education requires intersubjectivitya shared experience in which teacher and learner are united by a common zeal then distance education is a contradiction in terms. Distance *instruction* is possible, but distance *education* is not. Again, the advent of virtual systems used in distance education challenge the traditional answer to Keegan's question.

Central to Keegan's concept of distance education is the separation of teaching acts in time and place

from learning acts. Successful distance education, he believes, requires the reintegration of the two acts. Possibly the emphasis on making learning experiences equivalent for learners would contribute to the reunification of teaching and learning as simultaneously occurring acts. Equivalency theory should be evaluated by applying Keegan's criteria, as well as others, to determine if it is an approach to distance education that is appropriate.

Summary

The changing and diverse environment in which distance education is practiced has inhibited the development of a single theory upon which to base practice and research. A variety of theories have been proposed to describe traditional distance education. They include theories that emphasize independence and autonomy of the learner, industrialization of teaching, and interaction and communication. These classical theories emphasize the notion that distance education is a fundamentally different form of education. Recent emerging theories based on the capabilities of new interactive telecommunications-based audio and video systems suggest that distance education may not be a distinct field of education. Both the utilization of existing educational theory and the creation of equivalent experiences for the distant and local learner are emphasized. Classical distance education theorists need to address the changes to distance education facilitated by new technologies. Advocates of the new theories must consider the relationship of these to the traditional strengths of distance education. For example, the new theories' focus on face-to-face instruction eliminates the advantage of time independent learning that traditional theories of distance education value. The debate of these theoretical issues will only increase in the face of continued technological change.

An environment in which technology, society, economics, politics, and approaches to learning are all in transition suggests that theories, definitions, and the practice of distance education will continue to be contested. This theme of change will both challenge and motivate distance educators and researchers as they strive to understand and develop effective ways to meet the needs of learners around the world.

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