

# History, Theory, and Quality Indicators of Distance Education: A Literature Review

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## **Introduction**

A controversial topic in higher education today revolves around the enormous growth of distance education (Novak, 2002; Meyer, 2002). According to Mehrotra, Hollister, and McGahey (2001), “distance learning, or distance education, is not a future possibility for which higher education must prepare, it is a current reality creating opportunities and challenges for educational institutions; a reality offering students expanded choices in where, when, how, and from whom they learn; a reality making education accessible to ever larger numbers of persons” (p. ix).

Interest in the concept of distance education has grabbed the attention of university and college administrators, faculty, and other professionals all over the world (Willis, 1994; Birnbaum, 2001; Moore, 2003). A myriad of questions, concerns, and opinions from professionals in these university and college settings regarding the topic of distance education has bombarded the literature base. What is distance education? Where is it going? What types of technology should be used? What is the market? What type of support does distance education need from administration/faculty? What types of incentives are needed for faculty to be interested? What are the differences in traditional, on-campus courses versus courses delivered via distance education? What are student perceptions of distance education? However, with all the excitement and buzz around the potential applications of interactive computer technology, the one big question that professionals have been asking for years is, How do you ensure that distance education coursework and degrees are of high quality? (Meyer, 2002; Moore, 2003).

According to Sherry (2003), “translating ideals of academic excellence into applicable terms for providers and users of distance education is not an easy

task...[however] in this new century, with distance education expanding worldwide, the urgency of quality assurance is apparent” (p. 435). The issues surrounding quality of distance education have been discussed and debated by many different parties, including: federal government, state governments, accrediting associations, faculty, and even students (Meyer, 2002). Regardless of who is interested in quality of this unique educational environment that distance education establishes, “all stress the need to have a better understanding of what contributes to quality” in distance education courses and programs (Meyer, 2002, p.1). The purpose of this literature review is threefold: (1) to provide an extensive look into the history and new emergence of distance education, and (2) to provide an overview of the practice and research regarding distance education, specifically in the area of quality and (3) to investigate ways in which to assess quality of distance education programs and courses.

### **What is Distance Education?**

In order to determine quality indicators of distance education, one first must have an understanding of the following question: *What is distance education?* To say that this is a “loaded” question is an understatement, because there is not one clear-cut answer that is universally accepted. As mentioned by Hanson, Maushak, Schlosser, Anderson, Sorenson, and Simonson, (1997), the word “‘distance’ has multiple meanings...the term, ‘distance education’ has been applied to a tremendous variety of programs serving numerous audiences via a wide variety of media, [and] finally, rapid changes in technology challenge the traditional ways in which distance education is defined” (pg. 1).

Although there is difficulty in finding a universal definition of distance education, the ideas surrounding the educational endeavor are somewhat similar, and it is important

for professionals involved in any type of distance education to be able to clearly define which theoretical underpinnings and definitions of distance education are foundational in their respective courses or degree programs (Keegan, 1996). The generic term “distance education” encompasses many different terms that have previously been used to describe education that takes place in a nontraditional environment. For example, distance education subsumes terms such as, correspondence study, home study, independent study, external study, distance learning, distance instruction and distance teaching, although the terms are not synonymous (Keegan, 1996). For the purposes of this literature review, the suitable term for the form of education and the educational environment to be discussed is distance education. As portrayed by the following definitions, there are many differing views of the research and practice of distance education, and these views will help to give insight to the theory of distance education highlighted by each definition (Hanson et al, 1997).

*Definitions of Distance Education Cited in the Literature*

Rudolf Manfred Delling’s (1966), who is a German historian and bibliographer, definition states (Keegan, 1986, p. 57),

Distance education (Fernunterricht) is a planned and systematic activity which comprises the choice, didactic preparation and presentation of teaching materials as well as the supervision and support of student learning and which is achieved by bridging the physical distance between student and teacher by means of at least one appropriate technical medium (Delling, 1966, p. 186).

To G. Dohmen (1967), a former director of the German Distance Education Institute (DIFF) at Tübingen (Keegan, 1996),

Distance education (Fernstudium) is a systematically organized form of self-study in which student counseling, the presentation of learning material and the securing and supervising of students' success is carried out by a team of teachers, each of whom has responsibilities. It is made possible at a distance by means of media which can cover long distances. The opposite of 'distance education' is 'direct education' or 'face-to-face education': a type of education that takes place with direct contact between lecturers and students (Dohmen, 1967, p. 9).

O. Peters (1973), who worked at DIFF in Tübingen (Keegan, 1996), defines distance education as the following:

Distance teaching/education (Fernunterricht) is a method of imparting knowledge, skills and attitudes which is rationalized by the application of division of labour and organizational principles as well as by the extensive use of technical media, especially for the purpose of reproducing high quality teaching material which makes it possible to instruct great numbers of students at the same time wherever they live. It is an industrialized form of teaching and learning (Peters, 1973, 206).

The definition presented by Michael Moore in 1973 and again, without any edits or changes, in 1977 states (Keegan, 1996),

Distance teaching may be defined as the family of instructional methods in which the teaching behaviors are executed apart from the learning

behaviors, including those that in a contiguous situation would be performed in the learner's presence, so that communication between the teacher and the learner must be facilitated by print, electronic, mechanical, or other devices (Moore, 1973, p. 664; 1977, p. 8).

B. Holmberg's 1977 definition of distance education incorporates his research, as he "writes from a developed knowledge of the literature in English, German, and the Scandinavian languages (Keegan, 1996, p. 42).

The term 'distance education' covers the various forms of study at all levels which are not under the continuous, immediate supervision of tutors present with their students in lecture rooms or on the same premises, but which, nevertheless, benefit from the planning, guidance and tuition of a tutorial organization (Holmberg, 1977, p. 9).

For D. Garrison and D. Shale (1987),

Distance education implies that the majority of educational communication between (among) teacher and student(s) occurs noncontiguously. It must involve two-way communication between (among) teacher and student(s) for the purpose of facilitating and supporting the educational process. It uses technology to mediate the necessary two-way communication (Garrison and Shale, 1987, p. 11).

In 1988, Hilary Perraton published her definition as,

Distance education is an educational process in which a significant proportion of the teaching is conducted by someone removed in space and/or time from the learner (Perraton, 1988, p. 34).

In 1989, Barker and colleagues provided a definition of distance education that captured the emergence of telecommunication technologies (Keegan, 1996).

Telecommunications-based distance education approaches are an extension beyond the limits of correspondence study. The teaching-learning experience for both instructor and student(s) occur simultaneously – it is contiguous in time. When an audio and/or video communication link is employed, the opportunity for live teacher-student exchanges in real time is possible, thereby permitting immediate response to student inquiries and comments. Much like a traditional classroom setting, students can seek on-the-spot clarification from the speaker (Barker et al, 1989, p. 25).

In 1990, M. Moore, the editor of *The American Journal of Distance Education*, provides another view of distance education, as his definition states,

Distance education is all arrangements for providing instruction through print or electronic communications media to person engaged in planned learning in a place or time different from that of the instructor or instructors (Moore, 1990, p. xv).

P. Portway's and C. Lane's (1994) four volume publication on telecommunications technologies in distance education states the definition of distance education given by Lane.

The term 'distance education' refers to teaching and learning situations in which the instructor and the learners are geographically separated, and therefore, rely on electronic devices and print materials for instructional

delivery. Distance education includes distance teaching – the instructor’s role in the process – and distance learning – the student’s role in the process (Portway & Lane, 1994, p. 295).

In order to develop a definition of distance education, Keegan (1996) analyzed each of the earlier definitions of distance education cited above and incorporated this form of education into five characteristics.

- The quasi-permanent separation of teacher and learner throughout the length of the learning process (this distinguishes it from conventional face-to-face education);
- The influence of an educational organization both in the planning and preparation of learning materials and in the provision of student support services (this distinguishes it from private study and teach-yourself programmes);
- The use of technical media – print, audio, video, or computer – to unite teacher and learner and carry the content of the course;
- The provision of two-way communication so that the student may benefit from or even initiate dialogue (this distinguishes it from other uses of technology in education); and
- The quasi-permanent absence of the learning group throughout the length of the learning process so that people are usually taught as individuals rather than in groups, with the possibility of occasional meetings, either face-to-face or by electronic means, for both didactic and socialization purposes (Keegan, 1996, p. 50).

According to Moore and Kearsley (1996),

Distance education is defined as planned learning that normally occurs in a different place and requires a well-defined system of delivery that includes modified teaching techniques, alternative modes for communication, including, but not limited to technology, as well as alternative administrative and organizational components (In Birnbaum, 2001, p. 1).

In a book entitled, *Distance Learning: Principles for Effective Design, Delivery and Evaluation*, Mehrotra, Hollister and McGahey (2001), define distance education as:

Any formal approach to instruction in which the majority of the instruction occurs while educator and learner are not in each other's physical presence (p. 1).

Lastly, Picciano's (2001) definition of distance education, as cited by Birnbaum, states,

Distance education uses three current and popular forms [of media]; (a) broadcast television, (b) two-way videoconferencing, and (c) asynchronous learning networks (Birnbaum, 2001, p. 4).

Asynchronous distance education "provide for multi-modal, Web-based delivery of instruction that can be reviewed by the student at any time" (Birnbaum, 2001, p. 4). This type of distance instruction allows students to access the materials, lectures, instruction, etc. from any place and at any time, as opposed to synchronous distance education.

It is evident from the varying definitions of distance education that as technology improves and the demand for interactive computer-based technologies increases, the idea of what distance education encompasses changes; however, the basic premises of

distance education remain the same. Within the 10 years since the World Wide Web was developed for users to connect to the Internet, the possibilities for distance education seem practically limitless, and with these new possibilities, come new emerging definitions of distance education. From these definitions, new theories of distance education begin to emerge. Distance education theories will be discussed later in the literature review, but an example of a new emerging theory from a compilation of definitions and research will be given here. B. Holmberg (2003) introduced a new theory of distance education based on empathy in the 2003 *Handbook of Distance Education* (Moore and Anderson, 2003), and he built upon past attempts to formulate such a theory, along with the use of other definitions and theories proposed by numerous professionals (Holmberg 1983; 1985; 1991; 1995b; 1997; 2001; Holmberg, Schuemer, & Obermeier, 1982; and elsewhere). In this new theory, Holmberg focuses on teaching, learning, and organization (or administration); the following is a summary of the theory:

1. Distance education mainly serves individual learners who cannot or do not want to make use of face-to-face teaching (i.e. usually working adults who wish to learn for career purposes or for personal development).
2. Distance learning is guided and supported by noncontiguous means, primarily preproduced course materials and mediated communication between students and a supporting organization (school, university, etc.) responsible for course development, instructional student-tutor interaction, counseling, and administration of the teaching-learning process inclusive of arrangements for student-student interaction. Distance education is

open to behaviorist, cognitive, constructivist, and other modes of learning. It may inspire metacognitive approaches.

3. Central to learning and teaching in distance education are personal relations between the parties concerned, study pleasure, and empathy between students and those representing the supporting organization. Feelings of empathy and belonging promote the students' motivation to learn and influence the learning favorably. Such feelings are fostered by lucid, problem-oriented, conversation-like presentations of learning matter expounding and supplementing the course literature; by friendly mediated interaction between students, tutors, counselors, and other staff in the supporting organization; and by liberal organizational-administrative structures and processes. Factors that advance the learning process include short turnaround times for assignments and other communications between students and the supporting organization, suitable frequency of assignment submissions, and the constant availability of tutors and advisors (Holmberg, 2003, p. 81-82).

From this example, it should be apparent how one's definition of distance education could potentially shape an emerging theory of distance education, and it is also important to remember that although technology advancements are ever changing and will more than likely result in new ideas of distance education, the underlying concept of distance education remains the same, which is to educate individuals in a nontraditional environment (i.e. classroom-type setting) through a variety of media. Additionally, Hoffman (1996) notes that it may be more beneficial to look at ways in which to

converge the ideas of distance education with that of traditional education, rather than analyze definitions that differentiate between the two (In Hanson et al, 1997).

### **History of Distance Education**

Although there has been a recent explosion of distance education, particularly due to the new technologies available, the origin of distance education can be traced back to over 100 years ago (Hanson et al, 1997; Meyer, 2002; Birnbaum, 2001, Mehrotra et al, 2001). According to Moore (1990), distance education, referred to in Moore's writing as correspondence study, began in the late 1800's. Correspondence study was developed in Germany by two researchers named Charles Toussaint and Gustav Langenscheidt, who were both language teachers in Berlin (Watkins, 1991). Another pioneer of distance education is Englishman, Isaac Pitman. He taught shorthand via correspondence study in England in the 1840's (Verduin & Clark, 1991). The concept of correspondence study made its way to the United States in 1873, when Anna Eliot Ticknor founded a Boston-based society named The Society to Encourage Studies at Home. Within 24 years, this society had attracted approximately 10,000 students (Watkins, 1991).

The state of New York authorized academic degrees through the Chautauqua College of Liberal Arts from 1883-1891 to students completing the required correspondence courses. Support for the new educational method is apparent in Yale Professor William Rainey's comments about correspondence study [distance education].

The student who has prepared a certain number of lessons in the correspondence school knows more of the subject treated in those lessons, and knows it better, than the student who has covered the same ground in the classroom. The day is coming when the work done by correspondence

will be greater in amount than that done in the classrooms of our academies and colleges; when the student who shall recite by correspondence will far outnumber those who make oral recitations (Watkins, p. 4).

Since the early 1900's, distance education has been incorporated into the practices of many institutions, as has the traveling of faculty to meet students off campus to conduct educational instruction (Moore, 1990). According to Meyer (2002), in order to help alleviate the demands of travel for faculty and students, institutions began utilizing available technologies, such as audio connections (i.e. telephones), videotapes, and television, to conduct distance education efforts. These types of delivery methods and media continued to be used, as distance education began to grow as a form of education.

Beginning in the 1980's, satellite telecommunications used to transmit broadcasting of lectures and instruction to off-campus locations became a popular way to conduct distance education. From the late 1980's to the 1990's, microwave-based interactive video was utilized, and this method of educational delivery was used until land-based interactive video was developed and used in the late 1990's. When the Internet and the World Wide Web became available, "a growing comprehension that education need not be site- or time-bound" began to develop throughout university and college settings.

As noted by Meyer (2002), research conducted by the National Center for Education Statistics (1999) indicated that higher education institutions offering distance education courses from Fall 1995 to academic year 1997-98 increased from 33 percent to 44 percent. Seventy-two percent of two-year public institutions and 79% of four-year

institutions offered distance education courses. Within the same time period, the study reported that the number of degree or certificate programs and courses doubled from 860 to 1,520 programs and from 25,730 to 52,270 courses. Student enrollment experienced a two-fold increase, from 753,640 to 1.6 million. Additionally, Internet use increased to 60% of institutions during 1997-1998. Meyer's (2002) analysis of the study indicates that "this doubling of effort (courses and programs) and student response from 1995 to 1997-1998 is a tribute to institutional entrepreneurialism, even though at times the demand for and potential seen for Web-based distance education outpaced what higher education could currently provide" (p. 3). Another study that reveals the increase in distance education course offerings in higher education was conducted by Green (2001), and the results of this project, entitled *The Campus Computing Project: 2001 Results in Claremont, CA*, indicated that during the time of the study, 55% of college campuses provided web-based course registration and 56% offered courses that are taught completely online. The increasing percentages of distance education offerings indicate that the support of distance education from institutions of higher education has only increased from year to year.

Support for distance education goes well beyond the university/college setting. According to Mingle's (1998) report entitled, *New Technology Funds: Problem or Solution*, in 1996-1997, legislatures appropriated over \$370 million to technology applications in higher education. In a report by the National Education Association (1997) entitled, *Going the Distance: State Legislative Leaders Talk about Higher Education and Technology*, state legislatures indicate their support for distance education to help improve access, student learning, cost of higher education, and productivity of

administration and faculty efficiency. In 1999, the National Governor's Association published *Transforming Learning through Technology*, and in 2001, the association developed two additional reports on the use of technology in postsecondary education and in the workforce, which provided information on how governors can benefit from investing in technology applications in the educational and worksite settings (National Governor's Association, 1999, 2001a, 2001b.). Lastly, in a U.S. Department of Education Agenda Project (2000), ideas on how to improve the Higher Education Act was contemplated, and within this report, distance education was given high priority and the importance of department support in adopting the ideas surrounding distance education was emphasized. As noted by Meyer (2002), "the support of the federal government has been essential in the effort to revise current regulations to remove barriers to new forms of distance education and to extend federal benefits (i.e. student aid) to distance education students," although this role is more constrained than the state government role (p. 5).

### **Brief Overview of Distance Education Theories**

The opening sentence in the 2003 *Handbook of Distance Education* states, "America's approach to distance education has been pragmatic and atheoretical" (Saba, 2003, p. 3). In addition, Charles Wedemeyer, a theorist who has made notable contributions in the area of distance education theory, claims that distance education has yet "to develop a theory related to the mainstream of educational thought and practice" (Keegan, 1996, p. 56). As noted by Saba (2003), distance education's roots in the United States date back to the 1800's; however, the first scholarly journal, *The American Journal of Distance Education*, was not started until 1987, by Michael G. Moore. This journal

and the symposia of the American Center for the Study of Distance Education, organized by Moore, emphasize the importance of distance education theory and recognize the contributions of research and practice in the discipline of distance education (Saba, 2003).

Distance education theories, developed from leading scholars in the discipline, such as Holmberg, Wedemeyer, Moore and Peters, can be categorized into three broad groups (Keegan, 1996; Saba, 2003).

1. *Theories of autonomy and independence.* Borje Holmberg, Charles Wedemeyer, Rudolf Dellinger, and Michael G. Moore developed theories of distance education that placed the learner in the middle of the educational process (Keegan, 1996; Saba, 2003). According to Saba (2003), “the centrality of the learner is one of the distinguishing features of distance education, and understanding this fact is essential for discerning why it is essentially different from other forms of education” (p. 4).
2. *Theory of industrialization.* Otto Peters, Desmond Keegan, Randy Garrison, and John Anderson are theorists in distance education that have developed theories that are mainly interested in how the field functions and how it is organized. Structural concerns and issues (e.g. industrialization) are the main foci of this group of theories, along with how those issues influence the teaching and learning process (Keegan, 1996; Saba, 2003).
3. *Theories of interaction and communication.* Contemporary ideas and views of Holmberg, John A. Baath, Kevin C. Smith, David Stewart, and John S. Daniel

highlight the constructs of interaction and communication as important factors in distance education (Keegan, 1996).

In order to better understand the ideas behind the development of each type of distance education theory, descriptions of several well-known theories are given in the following sections.

*Theory of Independent Study by Charles Wedemeyer*

For Wedemeyer (1981, see Saba), the fundamental nature of distance education is “a distinct ‘nontraditional’ type of education,” which focuses on the independence of the student learner (Keegan, 1996, Saba, 2003). The ideal distance education system that encompasses what Wedemeyer believed to be the essence of distance education is made up of ten characteristics. In order to emphasize independence and autonomy, the system should:

- be capable of operation any place where there are students – or even only one student – whether or not there are teachers at the same place at the same time;
- place greater responsibility for learning on the student;
- free faculty members from custodial-type duties so that more time can be given to truly educational tasks;
- offer students and adults wider choices (more opportunities) in courses, formats, methodologies;
- use, as appropriate, all the teaching media and methods that have been proved effective;
- mix and combine media and methods so that each subject or unit within a subject is taught in the best way known;

- cause the redesign and development of courses to fit into an “articulated media program”;
- preserve and enhance opportunities for adaptation to individual differences;
- evaluate student achievement simply, not be raising barriers concerned with the place, rate, method, or sequence of student study; and
- permit students to start, stop, and learn at their own pace (In Keegan, 1986, p. 63).

Additionally, Wedemeyer indicated four essential elements involved in every teaching-learning scenario: a teacher, a learner(s), communications system, and information to be taught or learned. His philosophy of successful distance education efforts included the development of a relationship between the teacher and the student (Hanson et al, 1997); however, Wedemeyer’s proposal on the separation of teaching from learning, included the following six characteristics of independent study:

- The student and teacher are separated.
- The normal processes of teaching and learning are carried out in writing or through some other medium.
- Teaching is individualized.
- Learning is made convenient for the student in his own environment.
- The learner takes responsibility for the pace of his or her own progress, with freedom to start and stop at any time (In Keegan, 1986, p. 64).

*Theory of Independent Study – Michael G. Moore*

Building on the work of Wedemeyer, Moore (1983) formulated a theory that investigates two variables in distance education programs: learner autonomy and distance

between learner and teacher (Hanson et al, 1997). The latter variable became known as “transactional distance”, which is used to define the unique relationship between the student learner and the teacher (Saba, 2003). For Moore, two factors are the essence of ‘distance’ – two-way communication (dialog) and the level of responsiveness to the needs of the individual learner (structure) (Hanson et al, 1997). According to Saba (2003), “Moore’s concept of transactional distance is important because it grounds the concept of distance in education in a social science framework and not in its usual physical science interpretation...this is a significant paradigm shift” (p. 5).

The second part to Moore’s theory involves learner autonomy; due to the distance between the teacher and the learner, a distance education student must accept responsibility for the learning process. Moore categorizes distance education programs into two categories: (1) learner-determined or “autonomous” and (2) teacher-determined or “non-autonomous” (Hanson et al, 1997). In order to determine to degree of autonomy, Moore utilizes the following three questions:

- Is the selection of learning objectives in the program the responsibility of the learner or of the teacher (autonomy in setting of objectives)?
- Is the selection and use of resource persons, of bodies and other media, the decision of the teacher or the learner (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)? (Keegan, 1986, p. 75).

#### *Theory of Industrialization – Otto Peters*

Peters (1988, 1994) theory of industrialization incorporates the idea that distance education is an industrialized method of teaching and learning, which can reach a mass

audience (Hanson et al, 1997; Saba, 2003). He compares distance education to the industrial production of goods, and in 1988, he introduced new terminology to be used in analyzing distance education.

- Rationalization: the utilization of methodical measures to decrease the amount of input of power, money, and time that is required (Hanson et al, 1997). In distance education, “ways of thinking, attitudes, and procedures can be found which only established themselves in the wake of an increased rationalization in the industrialization of production processes” (Peters, 1988, p. 98).
- Division of labor: the dividing of duties or tasks into simpler subtasks (Hanson et al, 1997). With distance education, all tasks, such as conveying information, assessment and performance recording, are conducted by individuals separately. Peters (1988) stated, “the division of labor is the main prerequisite for the advantages of [distance education] to become effective” (p. 100).
- Mechanization: without machines, distance education would not be possible (Peters, 1988). “Duplicating machines and transport systems are prerequisite, and later forms of distance learning have the additional facilities of modern means of communication and electronic data processing installations” (p. 101).
- Assembly line: workers usually remain stable, and the objects on which they are working move past them (Hanson et al, 1997). This is similar to instruction materials in distance education, because they are “designed,

printed, stored, distributed, and graded by specialists” (Hanson et al, 1997, p.10).

- Mass production: large quantities of good production. According to Peters (1988), the demand of distance education outweighs the supply in universities and colleges; therefore, large-scale operations, which are not common with traditional classes, have become the trend. Peters claims that such operations can help to enhance quality. He stated, “the large number of courses produced forces distance teaching organizations to analyze the requirements of potential distance learners far more carefully than in conventional teaching and to improve the quality of the courses” (Peters, 1988, p. 103).
- Preparatory work: this involves determining “how workers, machines and materials can usefully relate to each other during each phase of the production process.” Peters (1988) indicated that he believes that success of distance education depend on a “preparatory phase.” “It concerns the development of the distance study course involving experts in the various specialist fields with qualifications also often higher than those of other teachers involved in distance study” (p. 104).
- Planning: includes the “system of decisions which determines an operation prior to it being carried out.” Peters (1988) notes the high importance of planning, due to the fact that “the contents of correspondence units, from the first to the last, must be determined in detail, adjusted in relation to each other and represented in a predetermined number of correspondence

units. The importance of planning is even greater when residential study is a component of a distance education program” (p. 104).

- **Organization:** Peters (1988) defines this construct as “creating general or permanent arrangements for purpose-oriented activity.” He claims that “organization makes it possible for students to receive exactly predetermined documents at appointed times, for an appropriate university teacher to be immediately available for each assignment sent in” (p. 105). The concept of organization is “optimized in large distance education programs” (Hanson et al, 1997, p.10).
- **Scientific control methods:** Peters (1988) indicates that these are the methods by which “work processes are analyzed systematically, particularly by time studies, and in accordance with the results obtained from measurements and empirical data the work processes are tested and controlled in their elementary details in a planned way, in order to increase productivity, all the time making the best possible use of working time and the staff available” (p. 106).
- **Formalization:** In order to have successful distance education, the phases of the manufacturing process must be predetermined exactly, and this is termed formalization (Peters, 1988; Hanson et al., 1997).
- **Standardization:** restricts the “number of types of one product, in order to make these more suitable for their purpose, cheaper to produce and easier to replace.” A characteristic of distance education is that “not only is the format of the correspondence units standardized, [so is] the stationery for

written communication between student and lecturer, and the organizational support, as well as each single phase of the teaching process, but also the academic contents” (p. 107).

- Change of function: changing of the roles of workers within the production process (Hanson et al, 1997). “ The original role of provider of knowledge in the form of the lecturer is split into that of study unit author and that of marker; the role of counselor is allocated to a particular person or position. Frequently, the original role of lecturer is reduced to that of a consultant whose involvement in distance teaching manifests itself in periodically recurrent contributions” (p. 108).
- Objectification: the decrease of the “subjective element which used to determine” the work of craftsmen (p. 108). According to Peters (1988), in distance education, “most teaching functions are objectified as they are determined by the distance study courses as well as technical means. Only in written communication with the distance learner or possibly in a consultation or the brief additional face-to-face event on campus has the teacher some individual scope left for subjectively determined variants in ...teaching method” (p. 109).
- Concentration and centralization: Due to the large amount of capital needed for large-scale productions, the trend has been to established “large industrial concerns with a concentration of capital, a frequently centralized administration, and a market that is not seldom monopolized” (p. 109). According to Hanson and colleagues (1997), “it is more economical to

establish a small number of such institutions serving a national population, rather than a larger number of institutions serving regional populations (p. 11).

Peters' theory of industrialization has received much attention, and according to Saba (2003), "industrialization has been a feature of distance education for many years...in fact, it is hard to imagine distance education without some elements of industrialization" (p. 5). However, with the development and use of the Internet in the recent years, a potential for a "postindustrial form of education" has led to criticisms of the theory of industrialization (Saba, 2003, p. 6).

Garrison and Anderson (1999), built their research around the distinction between the role of what Daniel's (1998) research terms the "mega university" and research universities. This research also draws on "Schramm's (1977,), distinction between 'big media' and 'little media'" (Saba, 2003, p. 6). Garrison and Anderson (1999), "argued that, whereas mega universities might rely on big media to respond to a mass audience, research universities might rely on little media to offer a seemingly postindustrial form of education, or 'little distance education' (LDE)" (Saba, 2003, p. 6).

Due to the emergence of a postmodern era in the area of distance education, Peters changed his definition of distance education from...

A rationalized method – involving the division of labor – of providing knowledge which, as a result of applying the principles of industrial organization as well as the extensive use of technology, thus facilitating the reproduction of objective teaching activity in any numbers, allows a large number of students to participate in university study simultaneously,

regardless of their place of residence and occupation (Peters, 1967, p. 125,  
see Saba)

...to the following extended definition of distance education, which acknowledges the  
postindustrial era:

Distance education can be defined as a complex, hierarchical, nonlinear,  
dynamic, self-organized, and purposeful system of learning and teaching  
(In Saba, 2003, p. 12).

*Theory of Interaction and Communication – Borje Holmberg*

In 1986, Holmberg developed a theory of distance education that fits into the  
classification of a communication theory. The following are seven background  
assumptions for this theory:

- The core of teaching is interaction between the teaching and learning parties; it is assumed that simulated interaction through subject-matter presentation in pre-produced courses can take over part of the interaction by causing students to consider different views, approaches and solutions to generally interact with a course.
- Emotional involvement in the study and feelings of personal relation between the teaching and learning parties are likely to contribute to learning pleasure.
- Learning pleasure supports student motivation.
- Participation in decision-making concerning the study is favorable to student motivation.
- Strong student motivation facilitates learning.

- A friendly, personal tone and easy access to the subject matter contribute to learning pleasure, support student motivation and thus facilitate learning from the presentations of pre-produced courses, i.e. from teaching in the form of one-way traffic simulating interaction, as well as from didactic communication in the form of two-way traffic between the teaching and learning parties.
- The effectiveness of teaching is demonstrated by students' learning of what has been taught. (Holmberg, 1986, p. 123).

In 1986, Holmberg formed his “normative teaching theory” from the above assumptions:

Distance teaching will support student motivation, promote learning pleasure and make the study relevant to the individual learner and his/her needs, creating feelings of rapport between the learner and the distance – education institution (its tutors, counselors, etc.), facilitating access to course content, engaging the learner the activities, discussions and decisions and generally catering for helpful real and simulated communication to and from the learner. (Holmberg, 1986, p. 123).

In 1995, Holmberg developed an expanded and more comprehensive theory of distance education, and it is divided into eight different parts. This new theory incorporates concepts, such as the idea of the centralized learner, student freedoms and independence, the concept of free access to learning opportunities and equity, mediated communication and deep learning, personal relationships, study pleasure and empathy between students and instructors, and the idea of serving conceptual learning and problem learning (Holmberg, 1995). The new theory also emphasizes that “distance education is open to behaviorist, cognitive, constructivist, and other modes of learning”

(Holmberg, 1995, p 7-8). For a more in-depth look at the eight divisions of Holmberg's new theory, refer to Holmberg's document, entitled *The Sphere of Distance –Education Theory Revisited* (1995).

### *Systems Methodology*

As evident by the previous discussion on the few well-known theories of distance education, rapid changes in the field, whether it is brought about by sudden shifts of paradigms, such as the push toward postindustrial economics, or by technological advances and/or global developments, requires “a paradigm congruent with the pragmatic temperament in order to absorb” all of the changes (Saba, 2003, p. 17). According to Saba (2003), pragmatism can help formulate a systems view of distance education, and “provides a foundation for employing systems philosophy, methodology, and technology to establish an epistemology capable of serving the field in the foreseeable future” (p. 17).

In order for distance education to be considered an educational paradigm, theories of distance education must provide explanations for the whole of education and not only explanations of when the student and teacher are separated in time and space (Saba, 2003). Communication technology has helped to close the gap between learners and teachers, but “if students and teachers are separated by the total absence of dialog, as occurs in many classrooms across the country and around the world, bringing them together until they stand nose to nose will not offer a solution” (Saba, 2003, p. 17). Therefore, Vazquez-Abad and Mitchell (1983), Coldeway (1990), Moore and Kearsley (1996), and Saba (2003) emphasize the need for a “systems methodology” approach to understanding the complexity of distance education.

Saba (2003) provides an example of systems dynamics modeling, and the example will be given here to better explain the modeling procedures. In 1989, Saba used a systems method to demonstrate Moore's transactional distance concept by creating a causal loop between dialog and structure (In Saba, 2003) (SEE FIGURE 1). The figure, which is a replica of the figure presented in Saba (2003), indicates a negative feedback loop between structure and dialog. This model provides "a mechanism for determining how much transactional distance is desired and required at each point in time...if the learner needs more direct instruction, structure and transactional distance will both increase...if the learner requires more autonomy, transactional distance decreases as dialog increase and structure decreases" (Saba, 2003, p. 13). The inverse relationship between structure and dialog is considered the highest hierarchical level in the system, but these constructs can be investigated further in feedback loops that define other constructs, such as learner control and instructor control (Saba, 2003).

As mentioned by Saba (2003), a systems approach allows distance education to subsume "other forms of education, including what is generally known as face-to-face or traditional education" (p. 17). This approach also suggests that distance education emerged from the postindustrial culture; "while schools traditionally tried to standardize instruction to make people on the factory capable of performing routine jobs, the challenge of distance education is to respond to individual differences and make instruction as diversified as possible" (Saba, 2003, p. 17). Saba (2003) urges researchers to understand that the utilization of a systems approach will require data collection from the individual learner, including: prior knowledge, achievement of learning objectives, and assessment of new knowledge. The original studies in distance education utilized

experimental methods that Saba (2003) describes as “ill-equipped to shed light on dissimilarities between distance and face-to-face education that might exist” (p. 18); therefore, the need for further research in this area is needed.

### **Original Studies in Distance Education**

A discussion of the earlier studies conducted in the area of distance education is important in this literature review for two reasons: (1) to obtain a better understanding of the history of distance education and (2) to provide criticisms of the research that may eventually lead to future studies, as the field strives for high quality distance education practice and research.

As noted by Meyer (2002), one of the most quoted and perhaps most misunderstood research study conducted in the field of distance education was by Russell (1999). In this comprehensive study, Russell reviewed 355 studies on distance education from the year 1928 to 1998. A majority of the studies in Russell’s work compared instruction via some type of distance education technology (i.e. videotape, interactive video, telecourses, and television) to traditional, on-campus courses. The student measures that were compared consisted of test scores, grades, student satisfaction, and/or other measures that were specific to a certain study in the review. The results were overwhelmingly consistent; statistical tests indicated “no significant differences” between the distance education groups and the traditional, on-campus groups (Meyer, 2002). As noted by Meyer (2002), the important finding from Russell’s work is that regardless of what technology was utilized, the results were the same – “no significant difference in student achievement” (p. 14). Therefore, from these results, Russell indicated, “there is nothing inherent in the technologies that elicit improvements in learning,” however, “the

process of redesigning a course to adapt the content to the technology” can help to enhance the course outcomes (Russell, 1999, p. xiii). Meyer (2002) re-emphasized these findings by stating, “learning is not caused by the technology but by the instructional method ‘embedded in the media’” (p. 14). Finally, Russell (1999) concludes, “No matter how it is produced, how it is delivered, whether or not it is interactive, low-tech or high-tech, students learn equally well” (p. xiv). The same “no significant difference” results were found in two studies conducted by Saba (2000, 2003), when data gathered from hundreds of comparative studies between traditional classroom instruction and mediated education were analyzed (Saba, 2003); however, as mentioned earlier, Saba questioned the research designs and foundational theories (or lack thereof) of these comparison studies (Saba, 2003).

In an extensive review of original comparison studies conducted by Meyer (2002), she indicates her surprise in the number of comparison studies, similar in experimental design as the studies reviewed by Russell (1999) that have been conducted, even after Russell’s work implied the need for additional research. The studies of Bourne, McMaster, Rieger, and Campbell (1997), Davies and Mendenhall (1998), Dominguez and Ridley (1999), Gagne and Shepherd (2001), Hahn and colleagues (1990), Johnson (2001), McNeil and others (1991), Miller (2000), Mulligan and Geary (1999), Ryan (2000), Schulman and Sims (1999), Sener and Stover (2000), Serban (2000), Wegner, Holloway and Garton (1999), and Wideman and Owston (1999) compare distance education delivery methods to traditional forms of educational delivery only to find that there is “no significant difference” in student achievement (Meyer, 2002). However, Meyer’s analysis does indicate that “several [studies] found differences in

completion or student satisfaction,” although no differences were found in final grades or exams (Meyer, 2002, p. 14).

In a study conducted by Schutte (1997), online students were compared to face-to-face students in terms of the number of points earned for the course; results indicated that online students earned more points (out of 200) than the on-campus students. In Benbunan-Fich’s, Hiltz’s, and Turoff’s (2001) study on the differences in face-to-face and asynchronous distance education learning groups, the asynchronous group carried out broader discussion and submitted reports that were more complete than the face-to-face groups; however, the face-to-face group worked through case study problems more sequentially. Another study conducted in 2000 by Hartman, Dziuban, and Moskal, compared asynchronous learning networks (ALN) to traditional courses, and the results indicated that ALN courses had lower withdrawal rates and higher rates of success. Hiltz’s 1997 study on ALN’s indicated that students within the ALN tended to procrastinate, which could be related to any number of factors (i.e. asynchronous design, quality of student, proactive actions and behaviors of faculty and student); however, the results also showed that the ALN students felt they had worked harder in the course, had better access to their professor, and were appreciative of the convenience of learning from a distance (Hiltz, 1997).

Other comparative studies include Sener (2001) and Neuhauser (2002), which also compared asynchronous distance education courses to face-to-face courses. Sener (2001) found that community college students who participated in ALNs had improved student success rates and high student satisfaction rates. The comparison of two sections of the same course, one taught on-campus and the other via asynchronous distance

education methods, by Neuhauser (2002) resulted in no significant differences of the two courses in tests scores, assignments, and final grades; however, the online group's overall averages were slightly better than the on-campus group's averages.

In a meta-analysis of 24 studies comparing student satisfaction of distance education courses versus on-campus, traditional courses, Allen, Bourhis, Burrell, and Mabry (2002) conclude that there is a slight preference of students to take courses delivered in a traditional method over distance education; however, the findings also support that students are equally as satisfied with instruction via distance education as with traditional course delivery. As evident by the research presented, a majority of the research studies conducted on comparing traditional courses to distance education courses result in similar findings. With that being said, it is also important to note that there are many criticisms of the comparative research studies conducted in this area (Meyer, 2002). A discussion of these criticisms will help dissect where the field of distance education has been thus far, in terms of research and practice, and where the field needs to go in the future.

### **Criticism of Distance Education Research**

In a report funded by the American Federation of Teachers and the National Education Association, entitled *What's the Difference: A Review of Contemporary Research on the Effectiveness of Distance Learning in Higher Education*, Phipps and Merisotis (1999) firmly criticize the "no significant difference" research studies. According to Phipps and Merisotis (1999), the most significant problem with the comparative research studies is "that the overall quality of the original research is questionable and thereby renders many of the findings inconclusive" (p. 3). Phipps and

Merisotis indicate the lack of certain elements of quality in experimental designs, such as control variables, which increases the inability to show cause and effect, randomization, and validity and reliability measures of instruments used to gather data. They, along with Clark (1994, see KM) and Russell (1999), conclude that “perhaps the value of technology is that it leads to the question, What is the best way to teach students?” (In Meyer, 2002, p. 16).

Other critiques of these comparative research studies include Moore and Thompson (1997), who bring attention to the poor research designs and lack of control variables in the studies. In a meta analysis on comparing technology-based delivery modes to traditional delivery methods, Joy and Garcia (2000) also emphasize the weak research designs that did not incorporate control measures for certain important variables. Also, the point is even further emphasized by the fact that in a review of 170 articles published in magazines and in online journals by the American Center for the Study of Distance Education (1999), only 6 out of 170 incorporated a quasi-experimental design. In a review of articles from 1990 to 1997 by Berge and Mrozowski (2001), results showed that 84% of the research articles were case studies or descriptive, 7% were experimental studies and the remaining 8% were correlation studies. As mentioned by Meyer (2002), “the majority of articles published on distance education, Web-based education, and quality continue to be position papers, personal experiences, and advice to others contemplating a Web-based course. These articles may provide excellent advice, but they rarely present the results of well-designed research” (p. 17).

The important message revealed in the previous overview of distance education studies and the criticisms of these studies is that the primary aspect of research and

practice in the field of distance education that is overwhelmingly questioned by professionals in the field (and outside the field) is overall quality. In order to have a high degree of quality in distance education practice, there must be high quality research conducted to report findings that can then be applied to practical settings of distance education. This translation of research into practice, particularly high quality research, will help practitioners in the area of distance education design, implement and evaluate their programs and courses based on sound processes identified in the research.

### **Definitions of Quality**

In order to improve the quality of distance education offerings in practice and research, one must first know what quality is and how to assess quality in distance education programs. According to Meyer (2002), “the lack of consistent, agreed-on definitions for what quality is” can be very problematic (p. 22). Oblinger (1998) asked,

“Is quality assessed on faculty expertise or volumes in the library? Are some criteria more important than others? Further, how much weight should be placed on the traditional input variables, i.e., faculty degree or rank, library volumes, number and variety of degree programs, Carnegie classification. Which process variables should we use, those dealing with instructional models, attention to student learning styles and other important differences, the use made of technology, faculty/student ratios or class size, contact hours, or opportunities to be taught by full professors? And what outcome variables indicate quality – the final GPA, student satisfaction, alumni giving, or some assessment of what has been learned (if possible)? (In Meyer, 2002, p. 23).

These are the types of questions that are pondered by university/college administrators and faculty, the federal government, state governments, and researchers/practitioners in the field of distance education on a daily basis. It is difficult to provide a universal definition for quality, because the meaning of quality can change for different role players (Fresen, 2002). As stated by Nunan (1992), the construct of quality has meanings attached that are “embedded in the language of educational discourse, have a history, and are constantly being reshaped and reformulated....[therefore] the term quality defies any definition which will be universally accepted” (p. 7).

It is the purpose of the remaining sections of this literature review to further investigate quality indicators of distance education and to identify previous instruments used to assess quality of distance education programs. It should be noted, however, that “investigating the quality of distance education is...a complex undertaking which is located in an inherited context of time, place and power” (Nunan, 1992, p. 6). With that caveat in place, the implications of the compilation of articles and reports on quality indicators and instruments to assess quality in distance education should help the reader develop mechanisms of improving quality in their own programs and courses.

### **What Parties are Interested in Quality?**

To begin our discussion on quality of distance education programs, it is important to identify who is interested in defining, assessing, and ensuring quality in distance education. The federal government is interested, particularly the U.S. Department of Education, for several reasons. Quality education is a high priority for the department, and the rules, according to U.S. Department of Education, of establishing such quality have been revised to include support for distance education. Additionally, the department

has established a Distance Education Demonstration Program, which has partnered with the U.S. Congress of the Web-Based Commission to develop a report (In Meyer, 2002) that emphasizes the importance of distance education efforts, and it encourages the creation of more Web-based learning opportunities. (Meyer, 2002).

Secondly, the accrediting associations in education are interested in defining quality, as it relates to distance education. Before the recent expansion of distance education throughout educational systems across the globe, accrediting institutions relied on traditional measures of quality, mainly input and process measures, which made the focus the process instead of the learning outcomes. The joint statement, entitled *Statement of the Regional Accrediting Commissions on the Evaluation of Electronically Offered Degree and Certificate Programs and Guidelines for the Evaluation of Electronically Offered Degree and Certificate Programs*, from the six regional accrediting associations (Middle States Commission on Higher Education, North Central Association – Commission on Institutions of Higher Education, New England Association of Schools and Colleges, Northwest Association of Schools and Colleges, Southern Association of Schools and Colleges, and Western Association of Schools and Colleges) indicate support of online education (Council of Regional Accrediting Commissions, 2000).

The quality assurance measures for distance education, identified by the Council for Higher Education Accreditation (1998), are similar to traditional quality measures, in that faculty control plays a big role. Therefore, according to Meyer (2002), “accreditation has become a battlefield between those who would use traditional accrediting standards to forestall the changes wrought by distance education and those

who would change accreditation” (p. 9). The question then becomes, if traditional measures of quality are not appropriate for distance education, then what measures will be appropriate?

State governments are also interested in the quality of distance education programs. Meyer (2002) noted that state governments usually play two roles in the area of quality in distance education: (1) some states oversee program approval or conduct reviews for distance education programs offered, and (2) states may be responsible for approving operations of institutions that are either out-of-state or unaccredited to operate within the state.

Faculty are also interested in the issue of quality in distance education. The American Association of University Professors (AAUP) developed two reports (2001a, 2001b) addressing the issues surrounding quality in distance education. Within these reports, the “issues of greatest interest to professors, including academic freedom, intellectual property rights, faculty workload, and compensations” are identified (Meyer, 2002, p. 10). The last group interested in quality issues that are going to be discussed is the students. Although students, more than likely, have a different idea of what quality of distance education means, it is an important point-of-view (Meyer, 2002).

### **Guidelines to Assess Quality in Distance Education**

With the proliferation of distance education programs, the concerns and issues facing distance education, in terms of quality, come to the forefront. According to Gladieux & Swail (1999), the notion that expansion of distance education is being driven by demand rather than sound pedagogy has created some concern. As Sherry (2003) mentioned, “providing exemplary pedagogical experiences within rapidly changing

technological environments” can be somewhat difficult and takes “the combined efforts of everyone in the distance learning enterprise” (p. 435). In order to meet the demands on distance education, meet the needs of administrators, faculty and students, and to incorporate sound pedagogical techniques into distance education courses and programs, structured guidelines on what high-quality distance education should look like, is needed.

### **Benchmarks and Guidelines for Quality in Distance Education**

One of the first set of guidelines used by the Western Cooperative for Educational Telecommunications (WCET) in 1995 to assess the “best practices” of distance education programs were called the *Principles of Good Practice for Electronically Offered Academic Degree and Certificate Programs* (Western Cooperative for Educational Telecommunications, 1995). The principles were classified into seven different categories, including: curriculum and instruction, role and mission, faculty support, resources for learning, student services, commitment to support, and evaluation and assessment. Modifications to these original principles have been made and incorporated into updated guidelines, which will be discussed later in this review (Meyer, 2002).

Chickering and Gamson (1987) developed the *Seven Principles for Good Practice in Undergraduate Education*, and in 1996, Chickering and Ehrmann recognize that the “technology is a ‘lever’ for implementing the seven principles” (Meyer, 2002, p. 78). The seven principles that represent ‘good practice’, include educational programs that: encourage contacts between students and faculty, develop reciprocity and cooperation among students, uses active learning techniques, gives prompt feedback, emphasize time on task, communicates high expectations, and respect diverse talents and ways of learning (Meyer, 2002, p. 78).

In order to conduct evaluations at postsecondary institutions throughout the United States, Sherry (2003) indicates that the eight regional accreditation commissions utilize standards called *Guidelines for Distance Education: Principles of Good Practice* (Western Association of Schools and Colleges, 1997). These guidelines share some similarities to the *Seven Principles for Good Practice in Undergraduate Education* by Chickering and Gamson (1987) and Brookfield's (1990, see Sherry) perspectives on adult learning. For a more in-depth analysis of the similar concepts emphasized in these guidelines, refer to Sherry's (2003) analysis of these standards (Sherry, 2003, p. 437-440).

The Instructional Telecommunications Council (ITC) developed characteristics of successful distance education programs in 1998. These characteristics include: (1) financial support and commitment from all key players of administration, (2) a strong rationale for utilizing distance education delivery methods in the institution, (3) a clear analysis of the audience (who they are and what their needs are), (4) faculty and training support, (5) student support services that allows easy access to the instruction, and (6) the appropriate amount of staff and personnel to conduct the program (Tulloch & Sneed, 2000; Meyer, 2002, p. 78).

The ITC published a summary of the practices in the area of distance education that had become "standard" for high-quality programs (Tulloch and Sneed, 2000). The practices were grouped into five different categories: (1) learning goals, content presentation, and learning activities, (2) interactions, (3) assessment/measurement, (4) tools and media, and (5) faculty support and faculty (Meyer, 2002). As stated by Tulloch and Sneed (2000) and emphasized by Meyer (2002), "there is a danger that best practices

will become treated as rules, effectively blocking innovation and change” (p. 9).

Distance educators should also be cautious of utilizing quality standards and guidelines established for traditional instruction to assess distance education, because this has already led to the “use of technology to mimic the techniques of face-to-face instruction”, which may not be the correct route for this different form of educational delivery (p. 9).

The Institute for Higher Education Policy (IHEP) developed one of the most comprehensive statements regarding quality issues in distance education, entitled “Quality on the Line: Benchmarks for Success in Internet-based Distance Education” (Institute for Higher Education Policy, 2000; Novak, 2002). The report was written and published with support provided from The National Education Association, the largest organization for faculty of higher education, and one of “the top three business providers of a software platform for delivering online courses,” Blackboard (IHEP, 2000; Novak, 2002, p. 80). The IHEP was asked to write this report due to its previous experience in investigating quality in distance education. The IHEP’s 1999 report, “What’s the Difference? A Review of Contemporary Research on the Effectiveness of Distance Learning in Higher Education,” is widely utilized as a source for discussion around the issue of quality in distance education. As mentioned in the executive summary and introduction of the IHEP (2000) report, the purpose of this report is not to “overcome many of the limitations of previous research” noted by the 1999 IHEP report, but to build on case studies conducted in order to validate benchmarks of quality in distance education courses, particularly Internet-based courses, and to determine “how important the benchmarks are to the institutions’ faculty, administrators, and students” (IHEP, 2000, p. 1).

The methodology used to validate the benchmarks for quality consisted of three sequential phases. In the first phase, a comprehensive literature review was conducted in order to identify the benchmarks that have previously been recommended by other groups, organizations, and in scholarly articles and publications. The compilation of benchmarks from the literature resulted in a total of 45 benchmarks. Within the second phase, institutions with substantial involvement and experience in distance education and that “are providing leadership in Internet-based distance education” were identified (IHEP, 2000, p. 9). In the third phase, site visits to each institution identified in the second phase were conducted by a staff member of IHEP in order to evaluate “the degree to which the campuses incorporated the benchmarks in their Internet-based distance learning courses and programs” (IHEP, 2000, p. 2). The institutional visits consisted of interviews with students, faculty and administrators, and each person interviewed was asked to complete a Likert scale survey. In addition, all students enrolled in distance education courses that were not able to take part in the interview were asked to complete a survey. In all, 147 respondents, spanning 6 different institutions, were interviewed and/or surveyed. The result of the third phase was the initial 45 benchmarks were narrowed down to the 24 benchmarks of quality in distance education (IHEP, 2000). Additionally, the results indicated “that, for the most part, the benchmarks for quality Internet-based distance education were considered important and, in general, the institutions strove to incorporate them into their policies, practices, and procedures” (p. 2).

The 24 identified benchmarks to ensure quality of distance education were classified into seven different categories: institutional support, course development,

teaching/learning, course structure, student support, faculty support, and evaluation and assessment (IHEP, 2000).

*Institutional Support Benchmarks*

There are three benchmarks in this category:

- A documented technology plan that includes electronic security measures (i.e., password protection, encryption, back-up systems) is in place and operational to ensure both quality standards and the integrity and validity of information.
- The reliability of the technology delivery system is as failsafe as possible.
- A centralized system provides support for building and maintaining the distance education infrastructure (IHEP, 2000, p. 2).

Several institutional support benchmarks, originally identified by the literature review, were deemed not essential for assessing quality of distance education programs. The two benchmarks excluded were:

- Faculty are provided professional incentives for innovative practices to encourage development of distance learning courses.
- There are institutional rewards for the effective teaching of distance learning course (IEHP, 2000, p. 23).

The recommendation to eliminate these two benchmarks sparked much controversy; however, the decision was made based on the fact that these characteristics were not *essential* elements to the institutions delivering high quality distance education, therefore, it was decided that they not be included in the final list of benchmarks. Additionally, it was also noted that “distance education should be treated no differently than traditional classroom-based teaching” (IEHP, 2000, p. 23).

*Course Development Benchmarks*

Three benchmarks were classified as course development benchmarks for high quality distance education:

- Guidelines regarding minimum standards are used for course development, design, and delivery, while learning outcomes – not the availability of existing technology – determine the technology being used to deliver course content.
- Instructional materials are reviewed periodically to ensure they meet program standards.
- Courses are designed to require students to engage themselves in analysis, synthesis, and evaluation as part of their course and program requirements (IEHP, 2000, p. 2).

The benchmarks that were excluded from the final list in this category are also interesting to discuss. Several benchmarks that incorporate student learning styles were eliminated from the list, although “the literature on learning styles and the ability to customize learning styles to meet individual student needs is extensive” (Novak, 2002, p. 82). The IHEP report indicated that these benchmarks “received a cool reception from many faculty and administrators” (p. 24). Many respondents in the case study indicated the following:

Benchmarks addressing student learning styles [are] often platitudes with little basis in research and [are] very difficult to accomplish. While there is an implicit recognition of how students learn and an explicit understanding of the importance of interaction, constructive feedback, and

other characteristics of good pedagogy, benchmarks that required these practices are not necessary to ensure quality (p. 24).

The remaining benchmarks that were deleted called for design teams, consisting of faculty, content experts, instructional designers, evaluation experts, etc., and broad peer review processes. These benchmarks were seen by many as “overkill” (p. 24).

#### *Teaching/Learning Benchmarks*

There are three benchmarks for the teaching/learning category:

- Student interaction with faculty and other students is an essential characteristic and is facilitated through a variety of ways, including voice-mail and/or e-mail.
- Feedback to student assignments and questions is constructive and provided in a timely manner.
- Students are instructed in the proper methods of effective research, including assessment of the validity of resources.

Although important, the benchmarks excluded from this category included measures to ensure collaborative work and group work are of high quality (IEHP, 2000).

#### *Course Structure Benchmarks*

The final benchmarks in this category include the following:

- Before starting an online program, students are advised about the program to determine (1) if they possess the self-motivation and commitment to learn at a distance and (2) if they have access to the minimal technology required by the course design.

- Students are provided with supplemental course information that outlines course objectives, concepts, and ideas, and learning outcomes for each course are summarized in a clearly written, straightforward statement.
- Students have access to sufficient library resources that may include a “virtual library” accessible through the World Wide Web.
- Faculty and students agree upon expectations regarding times for student assignment completion and faculty response (IEHP, 2000, p. 3).

Two benchmarks that emphasized time expectations for students and faculty (i.e. amount of time per week for study and time periods for grading) were excluded from the final list of benchmarks (IEHP, 2000).

#### *Student Support Benchmarks*

The four student support benchmarks that were identified as valid benchmarks include:

- Students receive information about programs, including admission requirements, tuition and fees, books and supplies, technical and proctoring requirements, and student support services.
- Students are provided with hands-on training and information to aid them in securing material through electronic databases, interlibrary loans, government archives, news services, and other sources.
- Throughout the duration of the course/program, students have access to technical assistance, including detailed instructions regarding the electronic media used, practice sessions prior to the beginning of the course, and convenient access to technical support staff.

- Questions directed to student service personnel are answered accurately and quickly, with a structured system in place to address student complaints (IEHP, 2000, p. 3).

Student support is crucial in distance education, and although “many students who take a distance education course will never visit a campus and will not use campus-based student support services,” it is critical to provide alternative forms of support in order to ensure the success of the student (Novak, 2002, p. 81).

#### *Faculty Support Benchmarks*

This category has four benchmarks related to faculty support, and these include:

- Technical assistance in course development is available to faculty, who are encouraged to use it.
- Faculty members are assisted in the transition from classroom teaching to online instruction and are assessed during the process.
- Instructor training and assistance, including peer mentoring, continues through the progression of the online course.
- Faculty members are provided with written resources to deal with issues arising from student use of electronically-accessed data (IEHP, 2000, p. 3).

According to Novak (2002), some key issues surrounding faculty involvement in distance education where not addresses; including: “To what extent are faculty members responsible for the development of an online course? What role should instructional designers play in this process? Are online courses best developed by a single faculty member or a team?” (p. 81).

#### *Evaluation and Assessment Benchmarks*

In this category of benchmarks, there are three benchmarks that were identified for the final list.

- The program's educational effectiveness and teaching/learning process is assessed through an evaluation process that uses several methods and applies specific standards.
- Data on enrollment, cost, and successful/innovative uses of technology are used to evaluate program effectiveness.
- Intended learning outcomes are reviewed regularly to ensure clarity, utility, and appropriateness (IEHP, 2000, p.3).

This final classification of quality indicators in distance education is one of the most controversial topics in the area. As noted by Novak (2002), "differing opinions about the learning effectiveness and cost effectiveness of distance education are defended with passion along with an appeal to evaluate and assess every aspect of their enterprise" (p. 82). However, these benchmarks provide a guide on what variables should be investigated in order to evaluate quality of the distance education program.

The IHEP's report, *Quality on the Line*, provides an important foundation for research in the area of quality indicators in distance education. In light of additional research that introduces alternative perspectives to quality assessment, it is fair to conclude that "*Quality on the Line* outlines benchmarks that are necessary but not sufficient to ensure quality" (Novak, 2002, p. 83). The benchmarks provided in the IHEP's report emphasize pedagogical and curricular issues; however, issues surrounding policy, marketing and institutions are not well addressed (Novak, 2002). Therefore, it is

crucial to take a closer look into the literature at different views and perspectives on benchmarking in distance education.

Professional accrediting organizations also provide guidelines and benchmarks for assessing quality of distance education. In fact, the primary way in which current distance education programs are reviewed for quality is by accreditation, which consist of “external peer review of institutions and programs to assure and improve quality” (Council for Higher Accreditation Facts Sheet, 2001). Due to the fact there are eight different accrediting agencies in the U.S., the criteria for reviewing educational programs among each group is slightly different; however, because of the pressure of each association to develop guidelines to assess quality of distance education programs, the eight association combined forces to develop a joint *Statement of Commitment by the Regional Accrediting Commissions for the Evaluation of Electronically Offered Degree and Certificate Programs* (Council of Regional Accrediting Commissions, 2001 b). The report introduced a set of commitments believed to be of high importance in ensuring quality of distance education; these commitments were arranged into several classifications.

*Classification #1 – Commitment to Traditions, Values, and Principles*

The commission emphasizes the importance of developing standards around the core values of program mission statements. Secondly, they assert that student learning should take place in a dynamic and interactive environment, regardless of the format of delivery. Striving to meet the needs of students is another characteristic of distance education programs that the commission believes is of high priority, along with appropriate evaluation, assessment, and voluntary peer review procedures. Lastly, it is

noted that commissions emphasize the responsibility of accredited institutions to provide any and all resources needed to support distance education (Council of Regional Accrediting Commissions, 2001 b).

*Classification #2 – Commitment to Cooperation, Consistency, and Collaboration*

Characteristics of commitments in the second classification are pertaining to the consistency across all regional commissions in their standards for review. This category also emphasizes that institutions creating new distance education degrees should be aware that these programs will be subject to careful review. In addition, institutions are strongly encouraged to conduct self-evaluations of overall quality, and improvements should be made based on these evaluations (Council of Regional Accrediting Commissions, 2001).

The last section of the joint statement is compiled into another document, *Best Practices for Electronically Offered Degree and Certificate Programs* (Council of Regional Accrediting Commissions, 2001a), which is a summary of what is considered “best practice” for distance education, written by the Council of Regional Accrediting Commissions and the Western Cooperative for Educational Telecommunications. This document includes “guidelines for the myriad details related to the offering of distance education programs, including benchmarks for each area of activity and protocols that will assist administrators with both internal and external reviews” (Novak, 2002, p. 85).

*Institutional Context and Commitment* is the first component identified in *Best Practices* (Council of Regional Accrediting Commissions, 2001a). This component pays close attention to how well the distance education program coincides with the mission of the institution and whether or not the institution has “secured the resources necessary to

support students in this new initiative” (Novak, 2002, p. 85). The second component is *Curriculum and Instruction*, which emphasizes the importance of utilizing appropriate materials and curricula developed by qualified scholars in the field. It is within this component that “institutions are asked about provisions for interaction [between student and teacher] and the timeliness of instructor responses to students” (Novak, 2002, p. 85).

The third and fourth components included in the report are *Faculty and Student Support*. A compilation of personnel issues are incorporated into the faculty component; for example, issues involving compensation, intellectual property and workload are included. The student support component is concerned with services, such as: “assessment of readiness and advising, marketing information, full information about the course requirements and services, admissions, registration, and financial processes” (Novak, 2002, p. 85). One interesting inclusion within this component is a discussion on the importance of “building a sense of community for distance education students” (Novak, 2002, p. 85). According to the *Best Practices* report, “encouraging study groups, providing student directories, including off-campus students in institutional publications and events, and including these students in definitions of the academic community” are examples of activities that can help to build a sense of community for distance education students (p. 12). A very astute observation by Novak (2002) regarding the activities suggested by the *Best Practices* report to help build a sense of community is the “silence about new technology strategies that are used and promoted to build community”, such as: “threaded discussions, chat rooms, and various e-mail services” (p. 86).

The final component in the *Best Practices* report is *Evaluation and Assessment*. The importance of sound evaluation practices are emphasized within this component, and

the commissions are encouraging institutions to conduct frequent self-evaluations. Specifically, they would like institutions to engage in “sustained, evidence-based and participatory inquiry as to whether distance learning programs are achieving objectives” (p. 12).

In a similar report, *Accreditation and Assuring Quality in Distance Learning*, conducted by the Council for Higher Education Accreditation (2002), the common platforms used to assess quality by the eight regional accrediting institutions and the nine national accrediting organizations are again discussed. However, the report provides a good summary of the seven key areas that are reviewed when quality of distance education is examined, which were identified in the *Best Practices* report (Council of Regional Accrediting Commissions, 2001a):

- Institutional mission: Does offering distance education make sense in this institution?
- Institutional Organizational Structure: Is the institution suitably structured to offer quality distance learning?
- Institutional Resources: Does the institution sustain adequate financing to offer quality distance learning?
- Curriculum and Instruction: Does the institution have appropriate curricula and design of instruction to offer quality distance learning?
- Faculty Support: Are faculty competent engaged in offering distance learning and do they have adequate resources, facilities, and equipment?
- Student Support: Do students have needed counseling, advising, equipment, facilities, and instructional materials to pursue distance learning?

- Student Learning Outcomes: Does the institution routinely evaluate the quality of distance learning based on evidence of student achievement? (Council for Higher Education Accreditation, 2002, p.7).

Additional research conducted on quality of distance education indicates that the previously discussed approaches to assessing quality may not be enough to truly determine the degree of quality in a distance program. For example, Olgren (1998), suggests that one of the key factors to designing effective distance education programs is understanding the occurrence of learning and the learning process. She goes on to state that the emphasis on learning outcomes is not sufficient for assessing learning patterns; therefore, distance educators “will need to know more about their learners’ cognitive strategies and prior knowledge in the content area” (p. 87).

The last set of published guidelines that will be discussed were developed by the American Federation of Teachers (AFT) in 2000. The AFT published the report, *A Virtual Revolution: Trends in the Expansion of Distance Education* (2001), which focuses on the important role of teachers in distance education. The report suggests that distance education can provide great benefits to the field of education, as long as the decision-making involving the academic processes stay in the hands of the teachers. The AFT claims that a majority of distance education reviewed is “built on corporate ideas about consumer focus, product standardization, tight personnel control, and cost effectiveness” and “these concepts are contrary to the traditional model of higher education decision-making” (p.4). As a result of the philosophical stance taken by the AFT on distance education, 14 benchmarks for quality in distance education were presented in a document entitled *Guidelines for Good Practice* (AFT, 2000).

These benchmarks include standards that support a “strong role for faculty, such as retaining academic control, setting class size, and retaining creative control over the use and re-use of materials” (Novak, 2002, p. 88). Also, the AFT stresses the importance of “ensuring that faculty are in control of shaping and approving courses and integrating them into a coherent curriculum” (p. 20). Lastly, the AFT “encourages institutions to experiment with offering a variety of subjects through distance education and become ‘laboratories of program evaluation’, which places the responsibility for creating new approaches on the institutions best suited to implement and evaluate them” (Meyer, 2002, p. 81).

In a comprehensive literature review of quality assessment in distance education, Sherry (2003) constructs a list of institutional, faculty, and student guidelines to evaluate quality. This is a compilation of guidelines suggested by numerous contemporary research studies; the comprehensive list, as drafted by Sherry (2003) and references will be provided; however, refer to Sherry’s (2003) chapter on quality in distance education for a more in-depth look into the construction of the guidelines.

#### *Institutional Guidelines*

1. A change in the philosophical ideas of traditional and distance education to a “hub of learning” with a clearly stated mission and institutional responsibilities may help to enhance planning and implementation of distance programs (Parker, 1997; Regional Accrediting Commissions, 2000). (p. 451).
2. An organizational model that is flexible in governance, aware of institutional values and culture, incorporates academic supervision over courses and programs, and allows decision-making to go beyond “the chief information officer” may

- hasten the implementation process. (Parker, 1997; Regional Accrediting Commissions, 2000) (p. 451).
3. Distance education needs the allocation of financial resources, including the following (B. Greene, 2000; Institute for Higher Education Policy, 2000; Johnstone, 2000; Parker, 1997; Regional Accrediting Commissions, 2000; Stein, 2001; Web-based Education Commission, 2000) (p. 451).
    - Continuous funds to purchase, test, maintain and upgrade necessary technology.
    - Fiscal resources to support any training of faculty, staff and students.
    - Funds to distribute to faculty as compensation for engaging in the design and implementation of distance education courses. Compensation should recognize workload, intellectual property rights, and any incentive or reward issues.
    - Financial resources budgeted for instructional resources, including: copyright clearances, site licenses for materials used in instruction, virtual libraries, along with “cyber-based support services, such as online registration, university bookstore services, testing, tutoring, and academic counseling” (p. 451).
    - Funds to support ongoing evaluation and research of the quality of the program.
  4. Incorporate strategic plans to help in the decision making processes associated with blending traditional and distance education courses into a program, for

- example (K. Green, 2000; Inman et al, 1999; Institute for Higher Education Policy, 2000; Johnstone, 2000).
5. In order to emphasize the importance of quality assurance in distance education, Sherry (2003) suggests incorporating the “development, implementation, dissemination, and review of policies and technological solutions in accordance with laws and requirements” that meet specific standards of distance education into the governing structure of the distance education program. (Institute for Higher Education Policy, 2000; Kearsley, 2000; Parker, 1997; Regional Accrediting Commissions, 2000; Web-based Education Commission, 2000) (p. 452).
  6. To support contingency plans, pilot test the program prior to initiation. (Quality Assurance Agency for Higher Education, 2001)
  7. Incorporating ways to address the key institutional factors that help to improve success in higher education, such as access to resources and financial aid, may actually result in equitable access for possible constituencies (Pascarella et al., 1996, Tinto, 1993) (p. 452).
    - To help with the availability of financial aid, changes in the limitations placed on distance education funding by certain federal regulations can help, along with changes in tuition based on geographical areas (i.e. out-of-state tuition) and financial aid services to help with the expenses of hardware and software needed in the distance course.

- To increase access to resources, a method of selecting technologies that are universally available, affordable, and adaptable to accommodate different student impairments (i.e. visual, auditory or motor) should be established.
  - Incorporating physical resources (“regularly upgrade computer workstations for faculty and Web-based course application packages with their embedded communications tools”) and human resources (e.g. support staff to provide continuous technical assistance) with plans for newer technology for distance education may help to improve communications between faculty and students (p. 452).
8. Rigorous evaluations of distance education programs may highlight “conflicting situations” or areas that need to be improved (p. 452):
- The incorporation of systems analyses representing certain situations in distance education, such as educationally underprepared or overworked students, individual learners who are culturally distant or suffering from low confidence levels, or students who pose the threat of dropping out, may lead to better retention rates and improved overall support. (Dabbagh, 2000; Institute for Higher Education Policy, 2000; Morrison & Adcock, 1999; Parke & Tracy-Mumford, 2000; Phipps & Merisotis, 1999; Regional Accrediting Commissions, 2000; Thompson, 1998).
  - Compare overall program objectives to “learning outcomes, student satisfaction, and resource and technology use through the employment of multiple methods may provide information that meets the standards for utility (focused information needed by intended users), feasibility (realistic, careful,

cost-effective data gathering and tactful reporting), accuracy (valid and reliable), and propriety (adherence to legal and ethical procedures that respect the welfare of all affected)” (American Evaluation Association, 2000; Institute for Higher Education Policy, 2000; Regional Accrediting Commissions, 2000) (p. 452).

9. Activities to help “build a sense of community” for distance learners (Institute for Higher Education Policy, 2000).
10. Bring awareness to the institutional standards set by accrediting organizations, increase marketing strategies for program and course availability, and provide access of educational program selections to both online and off-line potential students (Institute for Higher Education Policy, 2000).
11. Emphasize the fact that distance education programs are centered around the learner, not the technology, in order to portray that the “institution respects the goal of helping everyone in the community to lead a balanced life more than utilitarian solutions” (Yeaman, 2000). (p. 453).

#### *Faculty Guidelines*

1. One way in which to enhance team efforts to design and instruction of distance education courses, to interdisciplinary efforts, and to decreasing the gap between face-to-face instruction and distance education is to reconceptualize decisions regarding curricula (Institute for Higher Education Policy, 2000; Parker 1997).
2. Distance education can be enhanced through effectively designed instruction (Dabbagh, 2000; Kearsley, 2000; Parker, 1997; Ragan, 2000):

- Programs and courses that incorporate “constructivist principles that move students along a continuum to self-direction and have a valid and credible content have a likelihood of conveying to the learners that expectations for their success are high” (p. 453).
  - Flexible, problem-based instruction, that includes a variety of perspectives, may help improve levels of achievement.
3. Active and reflective learning may be supported by emphasizing clear learning goals and objectives that relate to the learning outcomes (Ragan, 2000, Inman et al, 1999, Regional Accrediting Commissions, 2000).
  4. Conducting orientation sessions to explain the course (i.e. objectives, goals, technology) portrays support for student learning (Institute for Higher Education Policy, 2000; Kearsley, 2000; Regional Accrediting Commissions, 2000):
    - Orientations sessions may open up the door for increased student-instructor communication.
    - Directions on how to navigate through the technologies utilized will help make the use of those technologies easier throughout the course.
  5. Providing advice to students on successful distance learning activities, may help “students acquire realistic expectations, and tangible aides, such as guides and clear due dates, may help students avoid procrastination (Institute for Higher Education Policy, 2000; Kearsley, 2000; Parker, 1997; Regional Accrediting Commissions, 2000) (p. 453)
  6. Directions on how to utilize the avenues of communication with others, such as chat rooms, message board, e-mail, may help the learner with discussions. Also,

- during the instruction, it may be useful to identify all the types of interaction – social, procedural, expository, explanatory, and cognitive – to encourage students to engage in these types of interactions (Bailey & Luetkehans, 1998; Burge, 1998, Dabbagh, 2000; Lesniak & Hodes, 2000; Offir & Lev, 2000; Winograd, 2000).
7. In order to solicit interchanges between the instructor and the student, communication from the faculty member that asks for some feedback from the student in a certain time period may help (Burge, 1998; Dabbagh, 2000; Inman et al, 1999; McIsaac et al, 1999).
  8. The incorporation of adapted design and Web-based materials to accommodate visually, hearing, and mobility impaired students may help enhance the expertise of the students (Kraft, 2000; Lowe & Roberts, 2000; Sherry, Billig, Jesse & Watson-Acosta, 2001).
  9. In order to support deep cognitive processes, provide metacognitive models to students and allow them to create their own model (Marland, 1997; Olgren, 1998).
  10. “Worldware, with its shared editing features, may draw multiple students into considering content during editing” (Anderson & Garrison, 1988) (p. 454).
  11. Incorporate technology-based evaluations to collect data on students’ learning and use of technology to improve teaching and learning in the distance education environment (Institute for Higher Education Policy, 2000; Regional Accrediting Commission, 2000; Sherry et al, 2001; Wade, 1999).

12. In order to identify and apply technological approaches and the research findings documented as “best practice”, active participation in continuous professional development is necessary (Barone, 2001; Ehrmann, 1997).
13. “Authentic reassessments of the teaching and learning climate may lead to clarity and appropriate learning outcomes (Institute for Higher Education Policy, 2000).

*Student Guidelines*

1. Before enrolling in a distance education course, potential students should conduct a rigorous self-assessment on characteristics, such as: their attitude toward distance education, financial resources, support from others, access to technology and literacy to the forms of technology used, the types of learning environments that work best for them, etc. (Dabbagh, 2000; Institute for Higher Education Policy, 2000; Kearsley, 2000; Regional Accrediting Commissions, 2000).
2. “Students from diverse cultural backgrounds who engage in explicitly communicating their expectations for online behavior early in the course to all involved may avoid inadvertent future cultural gaffes (Kearsley, 2000) (p. 454).
3. Students who utilize computer-based “agents” to locate guides, online materials, updated content material, and processes for software, are “drawn into the content of the learning materials more readily, thus supporting their cognitive strategies (Anderson and Garrison, 1988; Inman et al, 1999) (p. 454).

Due to the vast amount of research conducted on quality indicators of distance education, only a select number of benchmarks and guidelines were discussed in the previous section. For more information on different ideas, models, and emerging thoughts on quality in this form of education, refer to the following references: Benke,

Brigham, Jarmon and Paist, 1999; Benson, 2003; Gross, Gross, and Pirkle, 1998; Lee and Dziuban, 2002; Leh and Jobin, 2002; Marks, Sibley, and Arbaugh, 2005; Nunan and Calvert; 1992; Ragan, 1999; Sloan Consortium, 2004; St. Pierre, 1990; Trentin, 2000; Yeung, 2001. (Please note that this list is not a complete reference list of all research conducted on this topic, but the studies and reports listed here provide the reader with additional, and perhaps, alternative perspectives to quality in distance education).

As evident by the brief discussion on benchmarks, guidelines, and indicators of quality in distance education, the factors that comprise a high quality distance education program varies, depending on who you ask; however, the commonalities running through each perspective are essential aspects that should be incorporated into existing and future distance education efforts, in order to work towards improved quality in distance education. Therefore, the next step for professionals in the field of distance education is to integrate these quality assurance factors into the design, implementation and evaluation of current and future distance education efforts.

### **How to Assess Quality in Distance Education**

Now that we have a better understanding of the indicators research studies have identified as essential to ensure quality in distance education, the next phase is to identify how to assess if programs and courses delivered via distance education meet the standards of quality. In order to measure quality, rigorous evaluation methods, utilizing valid and reliable instruments and research designs, should be implemented. According to Thompson and Irele (2003), obtaining valid and reliable data requires that evaluators must first have a clear purpose and then be able to match that purpose to the appropriate tools.

Rigorous evaluation tools and approaches includes an array of data collection methods, such as surveys, personal diary entries from students, learning outcome instruments (i.e. tests, essays), product assessment criteria, participant observations, questionnaires, interviews, and pilot testing (Moore and Kearsley, 1996, Cyr, 2001). The primary focus of the remainder of this review is on issues of cultural bias and validity and reliability measures of survey instruments used to assess quality of distance education; however, for a more comprehensive review of evaluation models and tools utilized in the field, refer to Thompson and Irele (2003). The following sections provide a brief synopsis of the important elements of instrument construction, and provide information on instruments that have been previously utilized to assess quality of distance education.

### **Overview of Validity Measurements**

Validity is the “degree to which evidence and theory support the interpretations of test scores entailed by proposed uses of tests;” therefore, it is considered “the most fundamental consideration in developing and evaluating tests (*Standards for Educational and Psychological Testing*, 1999, p. 9). Instruments utilized to assess quality of distance education should be validated, which involves “accumulating evidence to provide a sound scientific basis for the proposed score interpretations” (*Standards for Educational and Psychological Testing*, 1999, p. 9). For example, to begin validating an instrument to assess distance education qualities, researchers must develop an interpretation of test scores, including a rationale for the proposed interpretation. The “proposed interpretation refers to the construct or concepts that test is intended to measure” (*Standards for Educational and Psychological Testing*, 1999, p. 9). Examples of constructs include:

student learning outcomes, student, faculty, and/or administrative attitudes, self-efficiency, learning styles, and performance of learner with distance education technology.

It is the responsibility of both the test (i.e. survey instrument) developer and the test user to validate the instrument; the developer of the instrument should provide evidence of validation, while the user should evaluate the evidence. Significant contributions are made “to the validity evidence”... “as other researchers report findings of investigations that are related to the meaning of scores on the test” (*Standards for Educational and Psychological Testing*, 1999, p. 11). Therefore, it is important for distance education researchers to validate instruments developed to assess quality.

There are different notions to validity, or better stated, different types of evidence to support validity. The four types of validity evidence investigated in this review, include: face validity, concurrent validity, predictive validity, and construct validity.

- *Face validity* – the items appear to be relevant to the constructs being investigated (Gomm, Needham, and Bullman, 2000).
- *Concurrent validity* – “refers to a measurement device’s ability to vary directly with a measure of the same construct or indirectly with a measure of an opposite construct. It allows you to show that your test is valid by comparing it with an already valid test.” (AllPsych ONLINE, 2005).
- *Predictive validity* – In the 1974 *Standards*, predictive validity referred to a type of “criterion-related validity”. This type of validity applies “when one wishes to infer from a test score an individual’s most probable standing on some other variable called a criterion” (*Standards*, 1999, p. 179-180). The term “criterion-

related validity” was changed to “criterion-related evidence” in the 1985 version of the *Standards*. The 1999 Standards states that “predictive evidence indicates how accurately test data can predict criterion scores that are obtained at a later time.” (p. 180).

- *Construct validity* – “the results achieved from using the instrument predict those matters which the theory underlying the instrument’s design says they should predict” (Gomm, Needham, and Bullman, 2000, p.82).

The reporting of validity results should incorporate statements on the types of evidence to support validity. General statements, such as the test or instrument is “valid” is rarely, if ever, accepted (*Standards*, 1999). It is also important to remember that the scores are being tested for validity evidence, not the instrument; therefore, it is incorrect to say that the instrument is valid.

### **Overview of Reliability Measurements**

According to the *Standards* (1999), reliability “refers to the consistency of such measurements when the testing procedure is repeated on a population of individuals or groups” (p. 25). Reliability measurements are reported in three different forms: standard deviation of measurement error or variance, standard reliability coefficients, or “IRT-based test information functions” (*Standards*, 1999, p. 27). The three broad categories of standard reliability coefficients that are traditionally accepted include: “(a) coefficients derived from the administration of parallel forms in independent testing sessions (alternate-form coefficients), (b) coefficients obtained by administration of the same instrument on separate occasions (test-retest or stability coefficients); and (c) coefficients based on the relationships among scores derived from individual items or subsets of the

items within a test, all data accruing from a single administration (internal consistency coefficients)” (*Standards*, 1999, p. 27).

Reliability reporting should entail more than a statement of reliability coefficients. Test developers and researchers should also include the methods used to get the coefficient, “the nature of the group from which the data were derived, and the conditions under which the data were obtained” (*Standards*, 1999, p. 31). As mentioned with validity reporting, it is not sufficient or acceptable to make general statements such as, “the instrument is reliable” (*Standards*, 1999); therefore, researchers need to provide enough evidence to support the statement of reliability.

### **Cultural Bias in Instrument Construction**

In terms of test construction, *bias* “refers to construct-irrelevant components that result in systematically lower or higher scores for identifiable groups of examinees” (p. 76). According to Frary and Giles (1980), *cultural bias* refers to a situation whereby a definable cultural subgroup results in lower average scores on assessment or evaluation instruments than other groups, but when tested on independent instruments of the same measures, the cultural subgroups perform the same or better than the other groups (Frary and Giles, 1980). Cultural bias “is the result of a general lack of fairness in testing, selection, and prediction among culturally different student groups” (p.51). (McGough, and Eschenmann, 1982). In order to conduct “fair” evaluations and assessments of distance education programs, it is important for researchers to incorporate procedures within the test/instrument construction process that will help to reduce cultural bias.

There are several perspectives of cultural bias. One view of this type of bias is “the question of bias does not depend upon the validity of individual items but instead

upon the overall capability of the instrument to equate the information fairly to non-biased groups.” (McGough and Eschenmann, 1982, p. 51). This perspective of cultural bias is not concerned with the content validity of individual items, as long as the overall instrument predicts equally well for all cultural and ethnic subgroups. Another perspective emphasizes internal construction of the assessment tool to reduce or eliminate the problems associated with cultural bias. For individuals supporting this view, cultural bias is “a statistically significant interaction between instrument items and ethnic characteristics” (McGough and Eschenmann, 1982, p. 51); however, one biased item does not deem the entire instrument culturally biased. In this perspective of cultural bias, it is important to incorporate procedures into instrument construction that require the “balancing (modification) of individual items to provide for an overall culturally fair instrument” (McGough and Eschenmann, 1982, p. 52). According to the *Standards* (1999), “a more widely accepted view would hold that examinees of equal standing with respect to the construct the test is intended to measure should on average earn the same test score, irrespective of group membership. Unfortunately, because examinees’ levels of the construct are measured imperfectly, this requirement is rarely amenable to direct examination” (p. 74). Refer to McGough and Eschenmann (1982) for an in-depth look into approaches for identifying cultural bias.

An examination of cultural bias in evaluation issues pertaining to distance education is of particular importance, because distance education methods afford the field of education the opportunity for individuals of different cultures and ethnicities, regardless of geographical location, to come together and share experiences. Therefore, it is important for procedures to reduce cultural bias to be incorporated into construction

of tools/instruments evaluating the quality of distance education. This is crucial in order to extract more accurate pictures of quality in distance education courses/programs. The following section provides an overview of the validity, reliability and procedures to reduce cultural bias in assessment tools or instruments used previously to assess quality in distance education.

### **Brief Review of Previous Instruments used to Assess Quality in Distance Education**

Stewart, Hong, and Strudler (2004) constructed an instrument that “allows instructors to conduct a comprehensive evaluation of the quality of Web-based courses” (p. 131). One of the limitations to the instrument construction was the inability to locate a previous instrument to assess construct validity; however, the researchers established a panel of experts to review the content of the instrument in order to ensure content validity. The instrument was pilot tested, reliability coefficient scores were calculated (Cronbach’s alpha), and a factor analysis was utilized to determine the structure of the data. There was no mention of procedures used to reduce cultural bias (Stewart, Hong, and Strudler, 2004).

In a study conducted by Roblyer and Wiencke (2003), a rubric to assess interactive qualities in distance education was developed based on theory and research findings. Reliability and validity (i.e content validity) results were reported in the study; however, the study did not include procedures to help reduce cultural bias. Similarly, Chiou and Chung (2003) developed an instrument to measure interaction in synchronous distance education. The procedures for the development of this assessment tool involved testing the reliability (Cronbach’s alpha) and content and construct validity of the instrument. However, as with the previous instruments, there was no mention of

procedures to ensure the reduction of cultural bias in Chiou and Chung's instrument construction.

Richardson and Price (2003) used two questionnaires developed by Ramsden (1991) and Ramsden and Entwistle (1981), The Course Experience Questionnaire (CEQ) and a short version of the Approaches to Studying Inventory (ASI), to obtain information on approaches to studying and students' perceptions of quality in distance education courses. Reliability and validity were examined using the reliability coefficient, Cronbach's alpha, and a factor analysis was conducted. The results indicated that the "ASI was unsatisfactory, but the CEQ is a useful tool for monitoring perceptions of academic quality across different modes of course delivery" (Richardson and Price, 2003, p. 54). However, the issue of cultural bias was not investigated in this study. In another study, conducted by Richardson (2005), an extended version of the CEQ (Wilson et al, 1997) and the Revised Approaches to Studying Inventory (RASI) (Entwistle et al, 2000) was utilized to assess the relationships between students' perceptions of academic quality and their approaches to studying for distance education courses. The reliability and internal consistency of the CEQ and RASI was evaluated by Cronbach's alpha (1951) and the construct validity was assessed using exploratory factor analysis. Both instruments proved to have satisfactory reliability and validity for use in distance education; however, as with the previous studies, there was no procedures on reduction of cultural bias discussed (Richardson, 2005).

Cheung (1998) developed a student evaluation instrument for distance education, which concentrated on the effectiveness of distance teaching. The study evaluated "the interrater reliability and construct validity of student evaluations collected by the

questionnaire...through analysis of variance and hierarchical confirmatory factor analysis, respectively” (Cheung, 1998, p. 23). The results indicated that the “35-item instrument developed on the basis of the conceptual framework could generate valid and reliable student evaluations” (p. 37). It is interesting to note that this study also did not address the issue of cultural bias.

There are many other studies that involve instrument construction for assessment of distance education courses, including: Abrami and Surkes (2004); Cartwright, Thompson, Poole, and Kester (1999); Perrine, (2003); and Thurmond, Wambach, Connors, and Frey (2002). The procedures utilized for developing these instruments involve measures to test reliability and validity of the scores of the instrument; however, each of these studies lacks the procedures to eliminate cultural bias in the instrument construction process.

### **Where to Go from Here**

Obviously, quality is a major concern for all parties involved in distance education. The research paints a clear picture of where this field has been but provides an abstract picture of where it is going. Clearly, more theory-driven research studies need to be conducted in order to have a better understanding of the uncertainties surrounding the idea of distance education, specifically in the area of quality assurance. According to the Institute for Higher Education Policy’s report, *What’s the Difference* (Phipps and Merisotis, 1999), the quality of original research conducted in distance education is questionable and bears several shortcomings that raise many questions about the quality of distance education. The shortcomings and gaps cited in this report provide a starting point for further research and investigations.

A vital component to good research in the area of distance education relates to the evaluation and assessments of current and future programs. One of the gaps in the current literature is the use of valid and reliable instruments to assess indicators of quality in distance education (Phipps and Merisotis, 1999); therefore, an area of research that is needed is the development of a valid and reliable instrument, based on theory, that can incorporate the quality indicators identified in the literature to accurately assess the quality of distance education programs and/or courses. Of course, this is only one area of research that is needed, and although this review provides many different views on what denotes quality in distance education and previous instruments that have proven to be valid and reliable in assessing a variety of aspects of quality, there are two concepts lacking in much of the instrument construction used previously: (1) the use of emerging distance education theory in the development process, and (2) the incorporation of testing procedures to reduce or eliminate different types of bias, particularly cultural bias.

### **Conclusion**

To say that distance education is a “hot” topic is an understatement. Many debates in the field of education have been centered on the topic of distance education. In fact, the buzz around the idea of distance education has echoed in the ears of university/college administrators, faculty, staff, students, and federal and state governments, and with this, many different opinions, views, and ideas regarding issues of distance education have emerged. As evident by this literature review, the accumulation of ideas make it rather difficult to “justify firm conclusions about many of the issues treated by the research studies” in the area of distance education. However, several

“tentative conclusions” regarding quality of distance education can be made from the research studies identified and reviewed in this paper (Meyer, 2002, p. 101).

First, it is safe to say that it is difficult to define the terms quality and distance education. There are no universal definitions to describe quality and distance education, as each term subsumes very complex concepts that depends on an array of factors, such as technology, faculty characteristics, the student, instructional design, etc (Meyer, 2002). Second, the majority of distance education research up to this point has consisted of atheoretical, pragmatic research designs and programs (Saba, 2003). Third, there is an enormous amount of literature on quality of distance education. This ranges from opinion pieces and perspectives on quality to research studies and case studies conducted on identifying key quality indicators for distance education. As stated by Meyer (2002), one of the biggest misconceptions about the field of distance education is that there is limited research on the topic; this is gravely wrong. There are hundreds of studies on quality of distance education; the problem is that many of the studies are not grounded in some sort of theoretical foundation; therefore, researchers are hindered in making generalizations and in replicating the studies.

Fourth, there is a need for more research in distance education that goes beyond comparing traditional courses to distance education courses. Research on topics such as: what types of technology works best with what type of learning styles, which theories best explain quality of distance education, and what instruction methods help students learn regardless of location, will help answer some of the questions surrounding distance education. Fifth, there are several criticisms of the overall quality of the original studies conducted in distance education. Among these complaints is the criticism that original

research lacked the utilization of valid and reliable instruments, which makes the overall results of many studies questionable (Phipps and Merisotis, 1999). Therefore, the need to development valid and reliable tools and to validate current assessment tools is apparent. The sixth and final conclusion made from this review is that perhaps one of the most untouched areas of research in instrument construction for distance education quality is in the area of cultural bias.

Distance education “encompasses a commitment to open opportunity and levels inequalities, a pedagogy that redirects some of the control and authority that conventionally lies with teachers toward the learners, a set of instructional design principles and methods of facilitating interaction, special leadership and managerial practices, a rethinking of educational policy, and a way of organizing resources that changes the balance of capital (technology) and labor (teachers) to create a more efficient system” (Moore, 2003, p.xxiii). Therefore, this form of education provides “the promise of better teaching, better quality of learning, and far better returns to public and private institutions for money invested in education and training” (Moore, 2003, p. xxiii). It goes without saying that distance education has its limitations; however, the “potential success of distance education” involves far more than the incorporation of technology into existing classroom tools and procedures. According to Moore (2003), “if anything threatens the potential success of distance education more than the rejection and neglect it has received in the past, it is the danger of overenthusiasm about technology leading to underfunded, undermanned, poorly designed, and poorly managed programs” (p. xxiii). Technology cannot replace instruction in a distance education course.

The future opportunities for distance education are limitless. Clearly, distance education programs and courses are here to stay, and will, more than likely, increase in number for years to come. It is important for professionals to have a well-grounded understanding of “the costs involved and of the need for substantial investment, training, reorganizing of administrations, monitoring and evaluation of learning, and support of learners – of the need, that is to say for careful long-term planning and development of new and different delivery systems” (Moore, 2003, p. xxiii), and certainly the key aspects to designing and implementing high quality distance education programs and courses are crucial.

References

- Abrami, P.C. & Surkes, M. (2004). The development of a questionnaire for predicting online learning achievement. *Distance Education*, 25(1), 31-47.
- Allen, M., Bourhis, J., Burrell, N. & Mabry, E. (2002). Comparing student satisfaction with distance education to traditional classrooms in higher education: A meta-analysis. *The American Journal of Distance Education*, 16(2), 83-97.
- AllPsych ONLINE. (2005). Research Methods: Chapter 7. Retrieved September 15, 2005 from <http://allpsych.com/researchmethods/validityreliability.html>.
- American Association of University Professors. (2001a.). Committee R on government relations report on distance learning. Retrieved from <http://www.aaup.org/statements/Redbook/DLREPORT.HTM>.
- American Association of University Professors. (2001b.). Statement on distance learning. Retrieved from <http://www.aaup.org/Issues/DistanceEd/StDistEd.HTM>.
- American Center for the Study of Distance Education. (1999). Internet-based distance education bibliography. Retrieved from <http://www.ed.psu.edu/acsde/annbib/partb.asp>.
- American Evaluation Association. (2000). The program evaluation standards
- American Federation of Teachers (2000). Distance education: Guidelines for good practice. Retrieved from [http://www.aft.org/higher\\_ed/downloadable/distance.pdf](http://www.aft.org/higher_ed/downloadable/distance.pdf).
- American Federation of Teachers (2001). *Virtual revolution: Trends in the expansion of distance education*. Washington, DC: American Federation of Teachers.

- Anderson, T.D. & Garrison, D.R. (1988). Learning in a networked world: New roles and responsibilities. In C.C. Gibson (Ed), *Distance learners in higher education: Institutional responses for quality outcomes* (pp. 97-125). Madison, WI: Atwood.
- Bailey, M.L. & Luetkehans, L. (1998, August). Ten great tips for facilitating virtual learning teams. Paper presented at the 14<sup>th</sup> Annual Conference on Distance Teaching and Learning, Madison, WI.
- Barker, B., Frisbie, A. & Patrick, K. (1989). Broadening the definition of distance education in the light of the new telecommunications technologies. *The American Journal of Distance Education*, 3(1), 20-29.
- Barone, C. (2001). Conditions for transformation: Infrastructure is not the issue. *Educause* [Online], 36(3). Retrieved from <http://www.educause.edu/pub/er/erm01/erm013w.html>.
- Benbunan – Fich, R., Hilz, S. & Turoff, M. (2001). A comparative content analysis of face-to-face vs. ALN-mediated teamwork. Retrieved from [http://www.alnresearch.org/Data\\_Files/Articles/abstract/abs\\_benbunan01.htm](http://www.alnresearch.org/Data_Files/Articles/abstract/abs_benbunan01.htm).
- Benke, M. Brigham, D., Jarmon, C.G., & Paist, E.H. (1999). Quality indicators for distance education programs. *Quality and Diversity in VET Research: Proceedings of the second national conference of the Australian Vocational Education and Training Research Association (AVERTA)*. Melbourne, Australia: Royal Melbourne Institute of Technology.
- Benson, A. (2003). Dimensions of quality in online degree programs. *The American Journal of Distance Education*, 17(3), 145-159.

- Berge, Z.L. & Mrozowski, S. (2001). Review of research in distance education, 1990-1999. *American Journal of Distance Education*, 15(3), 5-19.
- Birnbaum, B.W. (2001). Foundations and practices in the use of distance education. *Mellen Studies in Education* (Vol. 66, pp. 1-174). Lewiston: The Edwin Mellen Press.
- Bourne, J.R., McMaster, E., Rieger, J. & Campbell, J.O. (1997). Paradigms for on-line learning. *Journal of Asynchronous Learning Networks*, 1(2). Retrieved from <http://www.aln.org/alnweb/journal/issue2.assee.htm>.
- Brookfield, S.D. (1990). *The skillful teacher: On technique, trust, and responsiveness in the classroom*. San Francisco: Jossey-Bass.
- Burge, E. (1998). Gender in distance education. In C.C. Gibson (Ed), *Distance learners in higher education: Institutional responses for quality outcomes* (pp. 25-45). Madison, WI: Atwood.
- Cartwright, D.W., Thompson, R.J., Poole, M.C. & Kester, D.D. (1999). Assessing distance learning using a website survey. Paper presented at the Annual Forum of the Association for Institutional Research (39<sup>th</sup> Seattle, WA, May 30-June 3).
- Cheung, D. (1998). Developing a student evaluation instrument for distance education. *Distance Education*, 19(1), 23-42.
- Chickering, A.W. & Gamson, Z.F. (1987). Development and adaptations of the seven principles for good practice in undergraduate education. *New Directions for Teaching and Learning*, 4, 75-81.

- Chickering, A.W. & Ehrmann, S.C. (1996). Implementing the seven principles: Technology as lever. *AAHE Bulletin* [Online]. Available: <http://www.aahe.org/technology/ehrmann.htm>.
- Chiou, S. & Chung, U. (2003). Development and testing of an instrument to measure interactions in synchronous distance education. *Journal of Nursing Research*, 11(3), 188-196.
- Clark, R.E. (1994). Media will never influence learning. *Educational Technology Research and Development*, 42(2), 21-29.
- Coldeway, D.O. (1990). Methodological issues in distance educational research. In M.G. Moore (Ed). *Contemporary issues in American distance education* (pp. 386-406). Oxford: Pergamon Press.
- Council for Higher Education Accreditation. (1998). *Assuring quality in distance learning*. Washington, DC: Council for Higher Education Accreditation.
- Council for Higher Education Accreditation. (2002). *Accreditation and assuring quality in distance learning*. Washington, DC: Council for Higher Education Accreditation.
- Council for Higher Education Accreditation Fact Sheet. (2001). *The role of accreditation and assuring quality in electronically delivered distance learning*. Retrieved from [www.chea.org](http://www.chea.org).
- Council of Regional Accrediting Commissions. (2000). Statement of the regional accrediting commissions on the evaluation of electronically offered degree and certificate programs and guidelines for the evaluation of electronically offered

- degree and certificate programs. Retrieved from  
<http://www.wiche.edu/wcet/resources/publications/guidelines.pdf>.
- Council of Regional Accrediting Commissions (2001a). *Best practices for electronically offered degree and certificate programs*. Retrieved from  
<http://www.wiche.edu/telecom/Accrediting-BestPractices.pdf>.
- Council of Regional Accrediting Commissions (2001b). *Statement of commitment by the regional accrediting commissions for the evaluation of electronically offered degree and certificate programs*. Retrieved from  
<http://www.wiche.edu/telecom/Accrediting-Commitment.pdf>.
- Cronbach, L.J. (1951). Coefficient alpha and the internal structure of tests.  
*Psychometrika*, 16, 297-334.
- Cyrs, T.E. (2001). Evaluating distance learning programs and courses. Retrieved from  
[http://www.zianet.com/edacyrs/evaluate\\_dl.htm](http://www.zianet.com/edacyrs/evaluate_dl.htm).
- Dabbagh, N.H. (2000). The challenges of interfacing between face-to-face and online instruction. *TechTrends*, 44(6), 37-42.
- Daniel, S.J. (1998). *Mega-universities and knowledge media: Technology strategies for higher education*. London: Kogan Page.
- Davies, R.S. & Mendenhall, R. (1998). Evaluation comparison of online and classroom instruction for HEPE 129-Fitness and Lifestyle Management course. (ED 427 752).
- Delling, R. (1966). 'Versuch der Grundlegung zu einer systematischen Theorie des Fernunterrichts', in L. Sroka (Ed.). *Fernunterricht 1966*. Hamburg: Hamburger Fernlehrinstitut.

- Dohmen, G. (1967). *Das Fernstudium, Ein neues padagogisches Forschungsund Arbeitsfeld*, Tubingen: DIFF.
- Dominguez, P.S. & Ridley, D. (1999). Reassessing the assessment of distance education courses. *T.H.E. Journal*, 27(2). Retrieved from <http://www.thejournal.com/magazine/vault/A2223.cfm>.
- Ehrmann, S.C. (1997). Asking the right questions: What the research tells us about technology and higher learning. *CPB Annenberg Learner.org*. Retrieved from <http://www.learner.org/edtech/rscheval/rightquestion.html>.
- Entwistle, N., Tait, H. & McCune, V. (2000). Patterns of response to approaches to studying inventory across contrasting groups and contexts. *European Journal of Psychology of Education*, 15, 33-48.
- Frary, R.B. & Giles, M.B. (1980, April). *Multiple choice tests bias due to answering strategy variation*. Paper presented at the annual meeting of the National Council on Measurement in Education: Boston, Massachusetts.
- Fresen, J. (2002). Quality in Web-supported learning. *Educational Technology*, 42(1), 28-32.
- Gagne, M. & Shepherd, M. (2001). A comparison between a distance and a traditional graduate accounting class. *T.H.E. Journal*, 28(9). Retrieved from <http://www.thejournal.com/magazine/vault/A3433.cfm>.
- Garrison, R.D. & Anderson, T.D. (1999). Avoiding the industrialization of research universities: Big and little distance education. *The American Journal of Distance Education*, 13(2), 48-63.

- Garrison, D. & Shale, D. (1987). Mapping the boundaries of distance education: Problems in defining the field. *The American Journal of Distance Education*, 1(1), 4-13.
- Gladieux, L.E. & Swail, W.S. (1999). *The virtual university and educational opportunity: Issues of equity and access for the next generation: Policy perspectives*. New York: College Board Publications. (ERIC Document Reproduction Services No. ED 428 637).
- Gomm, R., Needham, G., & Bullman, A. (Eds). (2000). *Evaluating Research in Health and Social Care*. London: Sage Publications.
- Green, K.C. (2000). The 2000 national survey of information technology in U.S. higher education: Summary report [Online]. *The Campus Computing Project*. Retrieved from <http://www.campuscomputing.net>.
- Green, K.C. (2001). *The campus computing project: 2001 results*. Claremont, CA: Claremont Graduate University. Retrieved from <http://www.campuscomputing.net>.
- Greene, B. (2000). *Teachers' tools for the 21<sup>st</sup> century: A report on teachers' use of technology* (NCES 2000-102). Washington, DC: U.S. Department of Education, National Center for Education Statistics. Retrieved from <http://nces.ed.gov/pubs2000/2000102A.pdf>.
- Gross, R., Gross, D. & Pirkle, R. (1998). *New connections: A guide to distance education*. Washington, DC: Instructional Telecommunications Council.
- Hahn, H.A. et al. (1990). Distributed training for the reserve component: Remote delivery using asynchronous computer conferencing. (ED 359 918).

- Hanson, D., Maushak, N.J., Schlosser, C.A., Anderson, M.L., Sorenson, C. & Simonson, M.(1997). *Distance education: Review of the literature* (2<sup>nd</sup> ed.). Washington, DC: Association for Educational Communications and Technology. Ames, Iowa: Research Institute for Studies in Education.
- Hartman, J. Dziuban, C. & Moskal, P. (2000). Faculty satisfaction in ALNs: A dependent or independent variable? *Journal of Asynchronous Learning Networks*, 4(3), Retrieved September 15, 2005 from [http://www.aln.org/alnweb/journal/Vol4\\_issue3/fs/hartman/fs-hartman.htm](http://www.aln.org/alnweb/journal/Vol4_issue3/fs/hartman/fs-hartman.htm).
- Hiltz, S. R. (1997). Impacts of college-level courses via asynchronous learning networks: Some preliminary results. *Journal of Asynchronous Learning Networks*, 1(2). Retrieved September 15, 2005 from <http://www.aln.org/alnweb/journal/issue2/hiltz.htm>.
- Holmberg, B. (1977). *Distance Education: A Survey and Bibliography*. London: Kogan Page.
- Holmberg, B. (1983). Guided didactic conversation in distance education. In D. Sewart, D. Keegan, & B. Holmberg (Eds.), *Distance education: International perspectives* (pp. 114-122). London: Croom Helm.
- Holmberg, B. (1985). The feasibility of a theory of teaching for distance education and a proposed theory [ZIFF Papiere 60]. Hagen, Germany: FernUniversitat.
- Holmberg, B. (1986). *Growth and structure of distance education*. London: Croom Helm.
- Holmberg, B. (1991). Testable theory based on discourse and empathy. *Open Learning*, 6(2), 44-46.

- Holmberg, B. (1995). The sphere of distance-education theory revisited. (ERIC Document Reproduction Service No. ED 386 578).
- Holmberg, B. (1997). Distance education theory again. *Open Learning*, 12(1), 31-39.
- Holmberg, B. (2001). Distance education in essence. Oldenburg, Germany: Bibliotheks- und Informations system der Universitat Oldenburg.
- Holmberg, B. (2003). A theory of distance education based on empathy. In M. Moore & W.G. Anderson (Eds.) *Handbook of distance education* (pp. 79-86). Mahwah, NJ: Lawrence Erlbaum Associates.
- Holmberg, B., Schuemer, R., & Obermeier, A. (1982). Tutoring frequency in distance education: An empirical study of the impact of various frequencies of assignment submission. [Research Monograph No.1]. University Park: American Center for the Study of Distance Education.
- Inman, E., Kerwin, M., & Mayes, L. (1999). Instructor and student attitudes toward distance learning. *Community College Journal of Research and Practice*, 23, 581-591.
- Institute for Higher Education Policy (2000). *Quality on the line: Benchmarks for success in Internet-based distance education*. Washington, DC: Institute for Higher Education.
- Johnson, S.M. (2001). Teaching introductory international relations in a entirely web-based environment: Comparing student performance across and within groups. *ED at a Distance*, 15(10). Retrieved from [http://www.usdla.org/html/journal/JAN01\\_Issue/index.html](http://www.usdla.org/html/journal/JAN01_Issue/index.html).
- Johnstone, S.M. (2000). Online consortia may fall short. *Syllabus*, 14(4), 30.

- Joy, E.H. & Garcia, F.E. (2000). Measuring learning effectiveness: A new look at no significant findings. *Journal of Asynchronous Learning Networks*, 4(1). Retrieved September 15, 2005 from [http://www.aln.org/alnweb/journal/jaln\\_vol4issue1/joygarcia.htm](http://www.aln.org/alnweb/journal/jaln_vol4issue1/joygarcia.htm).
- Kearsley, G. (2000). *Online education: Learning and teaching in cyberspace*. Belmont, CA: Wadsworth.
- Keegan, D. (1986). *The foundations of distance education*. London: Croom Helm.
- Keegan, D (Ed.) (1996). *Foundations of distance education* (3<sup>rd</sup> ed.). London: Routledge.
- Kraft, N. (2000, January 11). Criteria for authentic project based learning [Online]. Denver, CO: RMC Research Corporation. Retrieved from <http://www.rmcdenver.com/useguide/pbl.htm>.
- Lee, J. & Dziuban, C. (2002). Using quality assurance strategies for online programs. *Educational Technology Review*, 10(2), 69-78.
- Leh, A.S.C. & Jobin, A. (2002). Striving for quality control in distance education. *Computers in the Schools*, 19(3-4), 87-102.
- Lesniak, R.J. & Hodes, C.L (2000). Social relationships: Learner perceptions of interactions in distance learning. *Journal of General Education*, 49(2), 34-43.
- Lowe, N., & Roberts, S. (2000, October). Web sites for the blind. Paper presented at the Annual Meeting for the Association for Educational Communications and Technology, Denver, CO.
- Marks, R.B., Sibley, S.D., Arbaugh, J.B. (2005). A structural equation model of predictors for effective online learning. *Journal of Management Education*, 29(4), 531-563.

Marland, P (1997). Towards more effective open and distance teaching. London: Kogan Page.

McGough, R.L. & Eschenmann, K.K. (1982). Reducing cultural bias in industrial education research. *Journal of Industrial Teaching Education*, 19(2), 51-58.

McIsaac, M.S., Blocher, J.M., Mahes, V. & Vrasidas, C. (1999). Student and teacher perceptions of interaction in online computer-mediated communication. *Educational Media International*, 36(2), 121-131.

McNeil, D.R. et al (1991). Computer conferencing project. Final report. (ED 365 307).

Mehrotra, C.M., Hollister, C.D., & McGahey, L. (2001). *Distance learning: Principles for effective design, delivery, and evaluation*. Thousand Oaks, CA: Sage Publications, Inc.

Meyer, K. A. (2002). Quality in Distance Education: Focus on On-line Learning. In A.J. Kezar (Ed.), *ASHE-ERIC Higher Education Report* (Vol. 29, pp. 1-134). Jossey – Bass.

Miller, B. (2000). Comparison of large-class instruction versus online instruction: Age does make a difference. Retrieved from [http://leahi.kcc.hawaii.edu/org/tcon2k/paper/paper\\_millerb.html](http://leahi.kcc.hawaii.edu/org/tcon2k/paper/paper_millerb.html).

Mingle, J.R. (1998). New technology funds: Problems or solutions? STATE lines. Retrieved from <http://sheeo.org/SHEEO/pubs-agb-tech.html>.

Moore, M. (1973). Toward a theory of independent learning and teaching. *Journal of Higher Education*, 44, 661-679.

Moore, M. (1977). *On a Theory of Independent Study*, Hagen: Fernuniversitat (ZIFF).

- Moore, M. (1983). Self-directed learning and distance education (ZIFF Papiere 48). Hagen, West Germany: Zentrales Institute fur Fernstudienforschung Arbeitsbereich, Fern Universitat. (ERIC Document Reproduction Service No. ED 257 430).
- Moore, M. (1990). Background and overview of contemporary American distance education. In M. Moore (Ed.) *Contemporary issues in American distance education* (pp. xii-xxvi). New York: Pergamon.
- Moore, M.G & Anderson, W.G. (Eds.) (2003). *Handbook of distance education*. Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Moore, M. & Kearsley, G. (1996). *Distance education: A systems view*. Belmont, CA: Wadsworth.
- Moore, M. & Thompson, M. (1997). The effects of distance learning. ACSDE Research Monograph, no. 15. University Park: American Center for the Study of Distance Education, The Pennsylvania State University.
- Morrison, G.R. & Adcock, A.B. (1999). Distance education research: Messages to the field. *TechTrends*, 43(5), 14-18.
- Mulligan, R. & Geary, S. (1999). Requiring writing, ensuring distance-learning outcomes. *International Journal of Instructional Media*, 26(4), 387-395.
- National Center for Education Statistics (1999). Distance education at postsecondary education institutions: 1997-1998. Retrieved from [http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid\\_00013](http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid_00013).

- National Education Association (1997). Going the distance: State legislative leaders talk about higher education and technology. Washington, DC: National Education Association.
- National Governors Association. (1999). Transforming learning through technology. Santa Monica, CA: Milken Exchange.
- National Governors Association. (2001a). The state of e-learning in the states. Retrieved September 15, 2005 from <http://www.nga.org/cda/files/060601elearning.pdf>.
- National Governors Association. (2001b). A vision of e-learning for America's workforce. Retrieved from September 15, 2005 from <http://www.nga.org/cda/files/elearningreport.pdf>.
- Neuhauser, C. (2002). Learning style and effectiveness of online and face-to-face instruction. *The American Journal of Distance Education*, 16(2), 99-113.
- Novak, R. J. (2002). Benchmarking Distance Education. *New Directions for Higher Education*, 118, 79-92.
- Nunan, T. & Calvert, J. (1992). *Report of the project to investigate quality and standards in distance education*. (ERIC Document Reproduction Services No. ED 369 980).
- Oblinger, D.G. (1998). Technology and change: Impossible to resist. *NCA Quarterly*, 72(4), 417-431.
- Offir, B. & Lev, J. (2000). Constructing an aid for evaluating teacher-learner interaction in distance learning. *Educational Media International*, 37(2), 91-97.
- Olgren, C.H. (1998). Improving learning outcomes: The effects of learning strategies and motivation. In C. Campbell (Ed.), *Distance learners in higher education: Institutional responses for quality outcomes*. Madison, Wisconsin: Atwood.

- Parke, M. & Tracy-Mumford, F. (2000). How states are implementing distance education for adult learners (State policy update). Washington, DC: National Institute for Literacy. (ERIC Document Reproduction Service No. ED 438 398).
- Parker, A. (1997, Fall-Winter). How-to manual: Research from the field. *Educational Technology Review*, 7-10.
- Pascarella, E.T., Whitt, E.J., Nora, A., Edison, M., Hagedorn, L.S., & Terenzini, P.T. (1996). What have we learned from the first year of the National Study of Student Learning? *Journal of College Student Development*, 37(2), 182-192.
- Perraton, H. (1988). A theory for distance education. In D. Stewart, D. Keegan, & B. Holmberg (Ed.) *Distance education: International perspectives* (pp. 34-45). New York: Routledge.
- Perrine, J. (2003). Developing an interaction-centered evaluation tool for distance education (Masters Thesis, Oregon Health & Science University).
- Peters, O. (1973). *Die Didaktische Struktur des Fernunterrichts*, Weinheim: Beltz.
- Peters, O. (1988). Distance teaching and industrial production: A comparative interpretation in outline. In D. Stewart, D. Keegan, & B. Holmberg (Eds.), *Distance education: International perspectives* (pp. 95-113). New York: Routledge.
- Peters, O. (1994). Distance education and industrial production: A comparative interpretation in outline (1967). In D. Keegan (Ed.), *The industrialization of teaching and learning* (pp. 107-127). London: Routledge.
- Phipps, R. & Merisotis, J. (1999). *What's the difference: A review of contemporary research on the effectiveness of distance learning in higher education*. Washington, DC: Institute for Higher Education.

- Picciano, A. (2001). *Distance learning: Making connections across virtual space and time*. Upper Saddle River, NJ: Merrill Prentice Hall.
- Portway, P. & Lane, C. (Eds.) (1994). *Guide to Teleconferencing and Distance Learning*, San Ramon, California: Applied Business Communications.
- Quality Assurance Agency for Higher Education (2001, November 27). *Distance learning guidelines* [Online]. Gloucester, England. Retrieved from <http://www.qaa.ac.uk/public/dlg/guidelin/htm>.
- Ragan, L.C. (1999). Good teaching is good teaching: An emerging set of guiding principles and practices for the design and development of distance education. *Cause/Effect*, 22(1). Retrieved from <http://www.educause.edu/ir/library/html/cem9915.html>.
- Ragan, L.C. (2000). Good teaching is good teaching: The relationship between guiding principles for distance and general education. *Journal of General Education*, 49(2), 10-22.
- Ramsden P. (1991). A performance indicator of teaching quality in higher education: The Course Experience Questionnaire, *Studies in Higher Education*, 16, 129-150.
- Ramsden, P, & Entwistle, N.J. (1981). Effects of academic departments on students' approaches to studying. *British Journal of Educational Psychology*, 51, 368-383.
- Regional Accrediting Commissions. (2000, Feb. 25). *Statement of the Regional Accrediting Commissions on the evaluation of electronically offered degree and certificate programs and guidelines for the evaluation of electronically offered degree and certificate programs (Draft)*. Boulder, CO: Western Interstate

- Commission for Higher Education. Retrieved from <http://wiche.edu/Telecom/Guidelines.htm>.
- Richardson, J.T.E. (2005). Students' perceptions of academic quality and approaches to studying in distance education. *British Educational Research Journal*, 31(1), 7-27.
- Richardson, J.T.E. & Price, L (2003). Approaches to studying and perceptions of academic quality in electronically delivered courses. *British Journal of Educational Technology*, 34(1), 45-56.
- Roblyer, M.D. & Wiencke, W.R. (2003). Design and use of a rubric to assess and encourage interactive qualities in distance education. *The American Journal of Distance Education*, 17(2), 77-98.
- Russell, T.L. (1999). *The no significant difference phenomenon*. Raleigh: North Carolina State University.
- Ryan, R.C. (2000). Student assessment comparison of lecture and online construction equipment and methods classes. *T.H.E. Journal*, 27(6). Retrieved from <http://www.thejournal.com/magazine/vault/A2596.cfm>.
- Saba, F. (2000). Research in distance education: A status report. Retrieved September 15, 2005 from <http://www.irrodl.org/content/v1.1/farhad.pdf>.
- Saba, F. (2003). Distance education theory, methodology, and epistemology: A pragmatic paradigm. In M.G. Moore & W.G. Anderson (Eds.), *Handbook of distance education* (pp. 3-20). Mahwah, NJ: Lawrence Erlbaum Associates.
- Schramm, W. (1977). *Big media, little media*. Beverly Hills, CA: Sage.

- Schulman, A.H. & Sims, R.L. (1999). Learning in an online format versus an in-class format: An experimental study. *T.H.E. Journal*, 26(11). Retrieved from <http://www.thejournal.com/magazine/vault/A2090.cfm>.
- Schutte, J.G. (1997). Virtual teaching in higher education: The new intellectual superhighway or just another traffic jam?, California State University, Northridge. Retrieved September 15, 2005 from <http://www.csun.edu/sociology/virexp.htm>.
- Sener, J. (2001). Bring ALN into the mainstream: NVCC case studies II. *Online Education*, 2, 7-29.
- Sener, J. & Stover, M.L. (2000). Integrating ALN into an independent study distance education program: NVCC case studies. *Journal of Asynchronous Learning Networks*, 4(2). Retrieved from [http://www.aln.org/alnweb/journal/Vol4\\_issue2/le/sener/le-sener.htm](http://www.aln.org/alnweb/journal/Vol4_issue2/le/sener/le-sener.htm).
- Serban, A.M. (2000). Evaluation of fall 1999 online courses. *ED at a Distance*, 14(10). Retrieved from [http://www.usdla.org/html/journal/OCT00\\_Issue/story04.htm](http://www.usdla.org/html/journal/OCT00_Issue/story04.htm)
- Sherry, A.C. (2003). Quality and its measurement in distance education. In M.G. Moore & W.G. Anderson (Eds.), *Handbook of distance education* (pp. 435-459). Mahwah, NJ: Lawrence Erlbaum Associates.
- Sherry, L., Billing, S., Jesse, D., & Watson – Acosta, D. (2001). Assessing the impact of instructional technology on student achievement. *T.H.E. Journal*, 28(7), 40-43.
- Sloan Consortium (2004). *Entering the mainstream: The quality and extent of online education in the United States, 2003 and 2004*. Needham and Wellesley, MA: The Sloan Consortium.

Standards for Educational and Psychological Testing (1999). Washington, DC: American Educational Research Association, American Psychological Association, and National Council on Measurement in Education.

St. Pierre, S. (1990). The need for expanded research in correspondence instruction: A literature review. *Continuing Higher Education Review*, 54(2), 79-97.

Stein, S. (2001). The media production model: An alternative approach to intellectual property rights in distance education. *Educause Review* [Online]. 36(1). Retrieved from <http://www.educause.edu/ir/library/pdf/erm0111.pdf>.

Stewart, I., Hong, E., & Strudler, N. (2004). Development and validation of an instrument for student evaluation of the quality of web-based instruction. *The American Journal of Distance Education*, 18(3). 131-150.

Thompson, M.M. (1998). Distance learners in higher education. In C.C. Gibson (Ed.), *Distance learners in higher education: Institutional responses for quality outcomes* (pp. 9-24). Madison, WI: Atwood.

Thompson, M.M. & Irele, M.E. (2003). Evaluating distance education programs. In M.G. Moore & W.G. Anderson (Eds.), *Handbook of distance education* (pp. 567-584). Mahwah, NJ: Lawrence Erlbaum Associates.

Thurmond, V.A., Wambach, K., Connors, H.R., & Frey, B.B. (2002). Evaluation of student satisfaction: Determining the impact of Web-based environment by controlling for student characteristics. *The American Journal of Distance Education*, 16(3), 169-189.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition*. Chicago: University of Chicago Press.

- Trentin, G. (2000). The quality-interactivity relationship in distance education. *Educational Technology, 40*(1), 17-27.
- Tulloch, J.B. & Sneed, J.R. (2000). Quality enhancing practices in distance education: Teaching and learning. Washington, DC: Instructional Telecommunications Council.
- U.S. Department of Education. (2000). Learning with limits: An agenda for the Office of Postsecondary Education. Washington, DC: U.S. Department of Education. Retrieved September 15, 2005 from <http://www.ed.gov/offices/OPE/AgenProj/report/index.html>.
- Vazquez-Abad, J. & Mitchell, P.D. (1983). A systems approach to planning a tele-education system. *Programmed Instruction and Educational Technology, 20*(3), 202-209.
- Verduin, J. & Clark, T. (1991). Distance education: The foundations of effective practice. San Francisco, CA: Jossey-Bass.
- Wade, W. (1999). Assessment in distance learning: What do students know and how do we know they know it? *T.H.E. Journal, 27*(3), 94-96.
- Watkins, B.L. (1991). A quite radical idea: The invention and elaboration of collegiate correspondence study. In B.L. Watkins & S.J. Wright (Eds). *The Foundations of American Distance Education* (pp. 1-35). Dubuque, Iowa: Kendall/Hunt.
- Web-Based Education Commission (2000). The power of the Internet for learning: Moving from promise to practice [Online]. Washington, DC: Author. Retrieved from <http://interact.hpcnet.org/webcommission/text.htm>.

- Wedemeyer, C.A. (1981). *Learning at the back door: Reflections on the non-traditional learning in the lifespan*. Madison, WI: University of Wisconsin Press.
- Wegner, S.B., Holloway, K.C., & Garton, E. M. (1999). The effects of Internet-based instruction on student learning. *Journal of Asynchronous Learning Networks*, 3(2). Retrieved from [http://www.aln.org/alnweb/journal/Vol3\\_issue2/Wegner.htm](http://www.aln.org/alnweb/journal/Vol3_issue2/Wegner.htm).
- Western Association of Schools and Colleges (1997). *Guidelines for distance education: Principles of good practice*. Retrieved from <http://www.wascweb.org/senior/guide/pgpal.htm>.
- Western Cooperative for Educational Telecommunications. (1995). *Principles of good practice for electronically offered academic degree and certificate programs*. Retrieved from <http://www.wiche.edu/telcom/projects/balancing/principles.htm>.
- Wideman, H., & Owston, R.D. (1999). Internet-based courses at Atkinson College: An initial assessment. Retrieved from <http://www.edu.yorku.ca/irlt/reports/techreport99-1.htm>.
- Willis, B. (Ed.) (1994). *Distance education strategies and tools*. Englewood Cliffs, New Jersey: Educational Technology Publications, Inc.
- Wilson, K.L, Lizzio, A. & Ramsden, P. (1997). The development, validation, and application of the Course Experience Questionnaire, *Studies in Higher Education*, 22, 33-53.
- Winograd, D.M. (2000). The effects of trained moderation in online asynchronous distance learning. Unpublished doctoral dissertation, Arizona State University, Tempe, AZ. (Digital Dissertations No. AAT 9976354).

Yeaman, A. (2000). Coming of age in cyberspace. *Educational Technology Research and Development*, 48(4), 103-107.

Yeung, D. (2001). Toward an effective quality assurance model of web-based learning: The perspective of academic staff. *Online Journal of Distance Learning Administration*, IV(IV), 1-17.