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Résumé de l'article

The premise of this article is that theoretical frameworks and models are essential to the long-term credibility and viability of a field of practice. In order to assess the theoretical challenges facing the field of distance education, the significant theoretical contributions to distance education in the last century are briefly reviewed. This review of distance education as a field of study reveals an early preoccupation with organizational and structural constraints. However, the review also reveals that the theoretical development of the field is progressing from organizational to transactional issues and assumptions. The question is whether distance education has the theoretical foundation to take it into the 21st century and whether distance education theory development will keep pace with innovations in technology and practice.

Theoretical Challenges for Distance Education in the 21st Century: A Shift from Structural to Transactional Issues

Randy Garrison

Abstract

The premise of this article is that theoretical frameworks and models are essential to the long-term credibility and viability of a field of practice. In order to assess the theoretical challenges facing the field of distance education, the significant theoretical contributions to distance education in the last century are briefly reviewed. This review of distance education as a field of study reveals an early preoccupation with organizational and structural constraints. However, the review also reveals that the theoretical development of the field is progressing from organizational to transactional issues and assumptions. The question is whether distance education has the theoretical foundation to take it into the 21st century and whether distance education theory development will keep pace with innovations in technology and practice.

Distance education methodologies have come into prominence during the last decades of the 20th century. The confluence of the need for continuous learning and unprecedented technological innovation in communications have pushed distance education approaches to the forefront of educational practice. However, whether the leaders of these initiatives are the technically literate or the politically powerful, they generally lack a coherent understanding of distance education practice and the full range of possibilities available to achieve desired outcomes. Senior administrators in higher education have become focused, not on educational issues, but the fiscal implications (i.e., cost savings) of distance education, and technology companies see profits (Feenberg, 1999).

Conceptual confusion is created with the advent of new terminology (virtual, open, distributed and distance education), new technologies, new program demands, new audiences, and new commercially competitive providers. These developments present enormous challenges for educators to make sense of the distance educational options available. In the context of current change, competition and confusion, distance educators have an unprecedented opportunity to provide leadership and direction. The challenge is to provide theory that will explain and anticipate distance education practices for a broad range of emerging educational purposes and experiences. The question is whether distance

education possesses the theoretical foundation and commitment to take it into the 21st century.

How well distance educators understand and communicate the principles of, and approaches to, distance education will determine their leadership role in the broader educational field. Leadership requires that the field's theories reflect the diversity and choice open to educators when adopting new technologies and approaches to teaching and learning at a distance. In much of traditional education there is a great deal of rhetoric about the need to adopt distance education methods. However, progress has been limited because few have the conceptual understanding to create a viable strategic plan for adopting distance education methods congruent with their institutional values and goals. Theory is an essential tool for educators to rethink how they will meet the needs of their institution and students when adopting distance education approaches.

Recent and rapid technological developments raise questions whether distance education theory has kept pace with new, affordable applications of communications technology and the changing educational needs of a learning society. We might ask whether distance education theory has captured the full range of possibilities made available by the rich and diverse developments in the field of communications and information technology? Does distance education as a field of study possess a synthesis of the principles and concepts capable of explaining and predicting developments in distance education in the 21st century?

In addressing these questions, this article will review the significant theoretical developments and contributions to the study of distance education. It will be shown that the study of distance education in the 20th century was primarily focused on distance constraints and approaches that bridged geographical constraints by way of organizational strategies such as the mass production and delivery of learning packages. This has generally been identified as the industrial era of distance education. More recently, we shall see that the focus in the study of distance education has shifted to educational issues associated with the teaching-learning transaction, specifically, the concerns regarding real, sustained communication, as well as emerging communications technology to support sustained communication anytime, anywhere.

As a consequence of documenting these theoretical developments, it will be argued that the 21st century represents the postindustrial era where transactional issues (i.e., teaching and learning) will predominate over structural constraints (i.e., geographical distance). From this, the challenges facing theory development in distance education will be identified as will a strategy for the development of theory that reflects current practice. However, before reviewing distance education theory, it would be advantageous to understand what is meant by theory and its value to a field of practice.

Expectations of Theory

Theoretical inquiry is central to the vitality and development of a field of practice – not to mention its recognition and credibility from those not yet initiated into the field. The theoretical foundations of a field describe and inform the practice and provide the primary means to guide future developments. The power of ideas, as represented in our theories, influences practice directly by focusing perspective, revealing knowledge and suggesting alternatives. Since ideas and ideals shape distance education practice, attention and effort must be devoted to the development of coherent, rigorous and valid theory. Theory is not limited to describing what is, but good theory should also help predict what will or could be.

Theory is also invaluable in guiding the complex practice of a rational process such as teaching and learning at a distance. Education is a purposeful activity and theory provides us with the understanding necessary to take effective action. Action, otherwise, is fortuitous or capricious. While those who are experts in the practice of a variety of forms of distance education may have the tacit knowledge to intuitively guide their educational decisions and effectively facilitate learning, this is not sufficient for the vast majority in the field. Nor is it helpful in directing new research and generating new ideas and concepts. It is theory that provides a coherent ordering of relevant variables and relationships to guide both practitioners and researchers.

But what do we mean by theory? What constitutes theory? Before we can assess distance education theory, it may be helpful to briefly outline what might constitute a theory.

Definitions of theory are numerous and somewhat problematic. For the sake of our discussion here let us begin with the basic definition that theory is "an explanation, a systematic account of relationships among phenomena" (McMillan & Schumacher, 1984, p. 11). To expand upon this definition, theory is a coherent and systematic ordering of ideas, concepts, and models with the purpose of constructing meaning to explain, interpret and shape practice. Theory can provide a perspective that reduces complexity while suggesting generalizability. The organized body of knowledge we call theory is an abstract and parsimonious constellation of articulated constructs for the express purpose of understanding and guiding practice.

Theory may have a number of forms. In this article, frameworks, models and concepts are considered important elements of theory and, in some cases, are synonymous with theory. A theoretical framework represents a broad paradigmatic set of assumptions that provides the elements of the theory but without the detail and completeness (nuances) of a comprehensive theory. A model is a less abstract form of a theory and represents structural relationships among the key concepts. It is a replica and often provides visual simplicity that can be

grasped at a glance. However, by itself, it may lack the richness of explanation inherent in a theory. Finally, concepts are the building blocks of a theory and evolve from ideas generated from direct experience. In this way they are less abstract and do not have the coherence of a framework, model or theory.

As noted previously, the purpose of theory is to create conceptual order and provide simplicity in describing complex phenomena. This order will reflect the values and assumptions that ultimately shape practice. It provides the foundational framework for the development of a field of study through the coherent description of current practice as well as the analysis and prediction of current and emerging trends. Such developments are revealed and sustained through rigorous and coherent theory building that is open to critique, discussion and confirmation. Theory is essential to understanding and communicating the purpose, methods and goals of a field of practice.

Good theory will reveal areas of inquiry and suggest potential hypotheses for the continued study and development of a field's theoretical foundation. This need for continuous theoretical development is a particular challenge for distance education as the technology and delivery methods have evolved rapidly. New descriptions and interpretations of practice are necessitated by the evolving practice of the field. In this way theory and practice are inextricably linked and rational action becomes theory-based.

Distance education theory must reflect both the purposeful and spontaneous nature of an educational experience. For this reason, we need theoretical constructs that are coherent and articulated but also flexible enough so as not to constrain critical and creative thought. The practical and evolving approaches to distance education must be reflected in its theory. The emerging practice of distance education is incorporating new and sophisticated communications technology. These technologies allow for the creation of synchronous and asynchronous collaborative communities of inquiry. The pressing challenge facing distance education theorists, therefore, is to adapt current theories to these new realities and, where appropriate, create new theory.

To understand the theoretical challenges facing distance education, it is essential to begin with a selected review of some of the influential theoretical contributions and then provide an analysis and interpretation of the current state of the field in terms of its study. In this regard, the review and analysis will reveal a distinct shift from organizational and distance concerns to transactional and educational issues. The results of this examination also suggest that theory may be lacking in the description of current developments in distance education practice, not to mention revealing future possibilities.

Major Theoretical Contributions

While it is not the purpose here to review definitions of distance education, a brief comment may be in order to clarify the place of definitions in theory development. In the past, definitions of distance education have served a useful purpose by explicitly revealing differing perspectives and assumptions. While definitions have provided a valuable first step, definitions in and of themselves do not constitute a theory. A definition may delimit the practice or identify specific principles but it is neither explanatory nor suggestive of future practice. Generally, the field has moved beyond definitional issues and has focused on the systematic development of theoretical frameworks and models.

We start our review of the theoretical contributions to distance education with the influential work of Charles Wedemeyer. In the 1960s Wedemeyer broke from the concept of correspondence study and focused instead on independent study or learning. In doing so he noted that a "particular philosophy of teaching and learning usually lies behind" (Wedemeyer, 1971, p. 548) the concepts of independent study and learning. It was clear that this was not merely a change in terminology. The focus on the pedagogical assumptions of independent study was a shift from the world of correspondence study dominated by organizational and administrative concerns, to a focus on educational issues concerning learning at a distance.

Notwithstanding Wedemeyer's (1971) clear focus on teaching and learning, independent study was focused on the individual as opposed to the group. Wedemeyer (1971) was careful to identify the characteristics and advantages of independent learning – not the least of which was "a democratic social ideal" (p. 549) of not denying anybody the opportunity to learn. Consistent with the principles of equity and access, independent study was also related to self-directed learning and self-regulation. Again we see a concern for learning but under the geographical and temporal control of the learner.

In addition to the obvious separation of teaching and learning tasks and responsibilities, Wedemeyer (1971) also identified defining characteristics such as communication, pacing, convenience and self-determination of goals and activities. He was a great advocate of freedom and choice for the learner. However, most significantly, Wedemeyer (1971) also noted that independent study "courses offer less freedom in goal determination and activity selection" (p. 551). He foreshadowed (or perhaps precipitated) a persistent debate in the literature by critiquing the practice of not individualizing (i.e., personalizing) independent study courses and the general practice and complacency to let the course determine (i.e., prescribe) the goals and activities. In this regard, Wedemeyer (1971) questioned "the seeming rigidity of the format and materials [that] apparently deters teachers and students from more completely exercising their respective options" (p. 551). He insisted that the "independent study method is not, in its basic concepts, different from other teaching-learning methods" (p. 553).

Wedemeyer's work is surprisingly relevant to a new era of theory development.

A hallmark of Wedemeyer's work was his "contribution to the establishment of the British Open University [BOU]" (Sherow & Wedemeyer, 1990, p.18). Through the Articulated Instructional Media (AIM) project initiated by Wedemeyer in 1964, it "was proposed that a unique system be developed for a new type of institution ... made possible through course design utilizing media and technology and ... supported by counseling and resource and learning centres" (Sherow & Wedemeyer, 1990, p. 18). The principles behind AIM were the subject of lectures throughout the United Kingdom in 1965. While the exact influence of his writings and lectures on the establishment of the BOU may be open to debate, clearly Charles Wedemeyer was a pioneer in the study of distance education.

Another person who was clearly linked to the historic development of the BOU was Otto Peters. From the current author's perspective, the most coherent, rigorous and pervasive example of distance education theory to date is the industrial production model of Otto Peters. In this model, conceived in the mid 1960s, Peters analyzed the structure of distance education and noted the possibility of adopting industrial production techniques such as a division of labor, mass production, and organization to realize economies of scale and reduce *unit* costs (Peters, 1994a). Considering the structural constraints and the reliance on self-instructional print packages, for Peters, this was the ideal context to adopt industrial approaches to education. While the industrial model had an enormous influence on distance education, it was not a theory of teaching nor of learning, but rather a contribution to clear thought about the organization of distance education. However, it had considerable influence on the creation of the British Open University in the early 1970s, and, in many ways, to this day, it dominates the field of distance education.

Peters' industrial model is an organizational model. It is about organizing the educational process to realize economies of scale. For this reason, teaching and learning issues are not of particular relevance. Peters (1994a) describes the industrial approach as "objectification of the teaching process" (p. 111). According to Peters (1994b), it "reduces the forms of shared learning, and keeps learners away from personal interactions and critical discourse" (p. 16). For this reason, Peters did not advocate this approach for all of distance education.

The dominance of structural and organizational concerns of the industrial model, over teaching and learning issues, is central to understanding theoretical developments and the challenges we face in developing distance education theory in this century. The industrial model placed in clear contrast the zero sum situation in having to choose between independence and interaction and established a constructive debate over the years regarding the inherent trade-off of these issues (Daniel & Marquis, 1979). In recent years, the advent of computer mediated communication (CMC) rendered this debate moot as it made possible both an independent and collaborative learning experience.

To understand Peters' core philosophical position, we take a brief look at his most recent work. Due to unprecedented changes in society, Peters (2000) offers a new structure for university education to include three basic forms of academic learning – "self-learning, tele-learning and social intercourse" (p. 15). Here he extends independent forms of learning at a distance (i.e., self-learning and tele-learning) with the inclusion of social intercourse. His argument is that communications technology and lifelong learning demands will precipitate a "transformation of the traditional university [and, presumably, all higher education] into an institution of self-study and distance teaching" (Peters, 2000, p. 20). From Peters' perspective, self-learning and tele-learning are very much autonomous approaches to learning.

It is safe to say that Peters remains an advocate for independent, self-study, although enhanced with social intercourse defined in a non-formal and individually controlled manner. While we see a new recognition for interaction, there is still a strong identification with the ideal of independence consistent with his industrial model. His *social intercourse* seems to support a general social presence among learners rather than academic critical discourse.

The point for Peters (2000) is that face-to-face discussion "can only be reproduced in part, and indeed in a reduced form, by mediated means" (p. 17). This is an important point. Here Peters identifies an important area of needed theory development when he rightly notes the difficulty of replicating face-to-face interaction by mediated means. In fact, Garrison, Anderson and Archer (2000) are studying the issue of learning in a text-based environment in the context of CMC. The theoretical analysis suggests that face-to-face interaction cannot be reproduced in whole within a text-based environment. The communication characteristics are very different and, therefore, the nature of the educational experience will be altered but not necessarily in a negative manner. However, Garrison et al. (2000) argue that a text-based environment may have an inherent communications advantage in supporting critical discourse in a community of inquiry. Regardless, these questions point to the importance of studying emerging issues such as the characteristics of spoken and written communication for the development of theory that helps distance education practitioners understand the use of mediated communication for educational purposes.

Next, we move to another pioneering theorist in distance education, Borje Holmberg, who has made substantial contributions to the theory of distance education over several decades. At the core of his (1989) theory of distance education practice is the concept of "guided didactic conversation" (p. 43). This refers to both real and simulated conversations, although the reliance is upon simulated conversation. As such, the emphasis is very much on the content and conversational character of the written pre-produced course package. Holmberg (1989) does acknowledge that regardless of how conversational the pre-produced course is, "communication between the student and the distance tutor has essential tasks" (p. 64). However, real conversation with the tutor is, by economic necessity,

supplementary to the pre-produced course.

Guided didactic conversation, Holmberg (1989) argues, is a "pervasive characteristic of distance education" (p. 43). In essence, his theory posits distance education as "friendly conversation [fostered by] well-developed self-instructional materials [resulting in] feelings of personal relation ... intellectual pleasure [and] study motivation" (p. 43). It is the responsibility of course developers to create this simulated conversation through well-written materials. Although *conversation* was the defining characteristic in Holmberg's theory of distance education, this theory was directed to the pre-produced course package and clearly within the industrial paradigm.

While Holmberg makes a great effort to place teaching at the core of his theory, his own structural assumptions and the central role of the self-study learning package limit teaching to one-way communication. The question arises as to whether an inert learning package, regardless of how well it is written, is a sufficient substitute for real sustained communication with the teacher as both content and learning expert (a tutor does not always fully meet this standard). The role of the teacher was largely simulated by way of written instructions and commentary. It is also interesting to note that there is no recognition that written communication may be qualitatively different from verbal discourse when guiding students. In sum, the organizational assumptions and principles of the industrial model and the dependence upon written communication seriously constrain and limit the role of conversation and the full emergence of a transactional perspective.

Another seminal work, first introduced in the early 1970s, is that of Michael Moore. Moore recognized the limitation of the structure of the independent learning package by including dialogue as a second variable. Moore's theory of transactional distance is intuitively appealing and moves the field toward the realization of a pedagogical theory. According to Moore (1991), transactional distance is pedagogical, not geographic, and necessitates "special organizations and teaching procedures" (p. 3) composed of two variables (clusters, dimensions?) – structure and dialogue (Moore, 1990; Moore & Kearsley, 1996). Structure reflects the course's design and is largely a function of the teaching organization and communications media employed. On the other hand, dialogue is also associated with the medium of communication and may include either real two-way communication or Holmberg's internal didactic conversation. In Moore's theory, the most distant program has low dialogue and low structure while the least distant has high dialogue and high structure.

Moore then adds another dimension – learner autonomy. Autonomy appears to be associated with a *personality characteristic* – that being personal responsibility associated with self-directedness (Moore, 1993; Moore & Kearsley, 1996). The greater the transactional distance the greater responsibility is placed on the learner. However, previously Moore (1990) defines autonomy as "the extent to which in a programme the learner determines objectives, implementation

procedures, and resources and evaluation" (p. 13). He suggests that the other end of this continuum is teacher control. The difficulty is that this polarization appears to conceptualize autonomy as less a function of personal responsibility and more a function of structure and the learning materials themselves.

In assessing Moore's contribution, he attempts to incorporate the structure of the industrial approach with the interaction of the transactional approach. In this way he extends the pedagogical perspective but appears to retain the dominant structural features of the industrial model. For example, he states, "what we are normally referring to as distance education is a subset of all educational programmes, the subset characterised by greater structure, [and] lower dialogue" (Moore, 1990, p. 12). More significantly, however, the exact nature of the interrelationships among structure, dialog and autonomy is not clear. There is confusion around whether structure and dialogue are variables, clusters or dimensions. Unfortunately, Moore has used different terms (i.e., variables, clusters, dimensions) at various times. Understanding transactional distance very much depends upon whether we are discussing a two-by-two matrix, a single continuum, or distinct clusters. This confusion is compounded when we add the concept of autonomy with its definitional problems (psychological or educational autonomy) and its relationship to transactional distance. Clearly, Moore's work remains one of the most appealing and well known theories of distance education. Yet, more macrolevel theoretical work is required that goes beyond simply *refining* this promising and appealing theory (Moore & Kearsley, 1996). Future work might focus on the interrelationship amongst the variables/concepts of dialogue, structure and autonomy. Are these orthogonally related or do they overlap? In addition to the "infilling of the theoretical spaces" (Moore, 1990, p. 14), the creation of a visual model would go a long way to clarifying the structural relationships among these concepts.

The next contribution to be discussed here explicitly places sustained real two-way communication at the core of the educational experience, regardless of the separation of teacher and student. This is a framework provided by Garrison (1989). While mediated communication is a defining characteristic of distance education and an important design concern, this framework did not redefine the essential nature of the teaching-learning transaction. Garrison and Shale (1990) made a point of emphasizing educational issues and titled their book accordingly – *Education at a Distance*. As Garrison and Shale (1990) state, they wished to "avoid the restrictive trap of describing distance education based upon its existing forms and structures" (p. 25). These were clear attempts to focus on the functional basis of education first by placing the teaching and learning transaction at the core of distance education practice. This was a clear attempt to break loose of the organizational assumptions of the industrial model.

The theoretical model proposed by Garrison and Baynton (1987) and updated by Garrison (1989) reflects the assumptions of this paradigmatic shift. This model of the educational transaction at a distance placed the concept of control

at the center of the transaction. Control was defined as the opportunity and ability to influence the educational transaction. This was intended to replace the concept of independence (self-study), often a core element of distance education with a more comprehensive perspective of the educational transaction. Shared control was seen to be reflective of the transactional nature of an educational experience. Two-way communication is central to control and at variance with independence that has the effect of reducing the legitimate and worthwhile role of the teacher and, thereby, risking isolation.

The control model places within the macrostructural level of teacher, student and content the microlevel transactional elements of proficiency (ability and motivation), support (human and non-human resources), and independence (opportunity to choose). Consideration of these transactional elements will determine the appropriate balance of control which can only be assessed and constantly adjusted through sustained two-way communication. Independence necessitated by structural constraints reflects only one set of variables to be considered in a complex educational transaction.

A more promising and somewhat more current contribution generated from a collaborative educational perspective is a framework and analytical model provided by Henri (1992). This framework was aimed at helping distance educators understand the learning process and the facilitation of interaction for collaborative learning. The analytical model consists of five dimensions of the learning process – participation, interaction, social, cognitive, and metacognitive. While these dimensions are in need of verification, the framework has informed and framed several studies of collaborative learning by way of computer mediated communication (Angeli, Bonk & Hara, 1998; Fabro, 1996; Hara, Bonk & Angeli, 2000; McDonald, 1998).

Perhaps Henri's real contribution is that it is a collaborative view of teaching and learning and provides a potential structure for coding CMC messages to study the nature and quality of the discourse. Henri's framework is a psychosocial, transactional perspective focusing specifically on teaching and learning facilitated through mediated communication. Interestingly, this framework is silent with regard to structural or distance constraints. Henri's framework focuses on educational and transactional issues and, therefore, is a significant shift away from the industrial model.

The previous descriptions certainly do not exhaust the many theoretical contributions to the field of distance education. Other contributions were not noted due either to their overlap with those described previously (e.g., Saba, 1989); their focus on definitional and historical descriptions (e.g., Keegan, 1990); or, as is the case of more recent contributions, their importance and impact being less well recognized and understood (Anderson & Garrison, 1997). It must also be emphasized that only the basic assumptions and concepts were extracted from the theories reviewed, while nuances and other refinements were omitted. However, it can be stated with some confidence that the selected models accurately

reflect the progression of a theoretical development of the field of distance education along an organizational (structural) – transactional (teaching and learning) continuum. The question now is whether distance education has the theoretical foundation to take it into the 21st century, and what theoretical challenges face distance education in keeping pace with emerging communications technology and new practices?

Progress and Challenges

In surveying the core theoretical contributions of the last three decades, we see evidence of a sound theoretical foundation. However, it is less obvious as to whether our current state of knowledge development is adequate to explain and shape new practices. It may well be worthwhile to step back and see if we are not dealing with a significant shift in perspective and practice and then assess the coherence and comprehensiveness of distance education theory. As noted previously, the evidence here suggests that we are experiencing the emergence of a new era of distance education characterized by a focus on transactional issues. Advances in communications technology have rendered the structural constraint of distance a relatively minor design challenge. It is the nature of a sustained educational transaction at a distance that must be described, understood and abstracted in a manner accessible to the broader field of educational practice.

Interestingly, it is Peters (1993), the theorist who provided the industrial model, who asks whether there are "early signs of a 'new era' which might be called 'postindustrial'?" (p. 40). The results of the previous review and similar arguments elsewhere (Garrison, 1997) suggest that we are entering a postindustrial era of distance education characterized by the ability to personalize and share control of the educational transaction through frequent two-way communication in the context of a community of learners. Moreover, this can be accomplished in an affordable manner along with access to educational resources and information via networks that may well provide educational experiences superior to traditional face-to-face educational experiences. An educator, as a member of a community of learners and not solely as a member of an organizational team of curriculum developers creating prepackaged self-study learning materials, may facilitate education at a distance in a timely and adaptable manner.

After having argued that a transactional approach (postindustrial) to distance education is emerging, it is important to qualify this statement by emphasizing that postindustrial technologies will not replace industrial approaches to distance education in the near future (Annand, 1999). Distance education theory should not be viewed as advocating "one-for-all practical recipes" (Sfard, 1998, p. 10), regardless of whether they are on the structural or transactional end of the distance education theoretical continuum. Having both valid structural and transactional theories are "our protection against theoretical excesses" (Sfard,

1998, p. 10). Orthodoxy of practice and certainty of perspective is detrimental in both short-term successes and long-term development of any field of study and practice. The ultimate theoretical challenge of any field of practice is to achieve a synthesis of perspectives and theories (i.e., global theory) that reflects the complete continuum and is inclusive of a full range of practices. At the same time, it must be noted that this is not a realistic expectation for distance education theory in the near term.

This century will see the emergence of a postmodern era of distance education characterized by increased diversity and choice. Such development is made possible by new communication technologies, as exemplified by the evolution of the *open universities* in their adoption of new models to complement the traditional self-paced, independent learning model of the industrial era (Davis, 1999). With continuous refinements, the ideal of the industrial era will become increasingly difficult to find in practice, but it still provides an important conceptual marker in the evolution of distance education as a field of study and practice. However, amongst the approaches to postindustrial distance education are principles and characteristics based upon the assumptions of a transactional model. If the field is to be relevant and credible in the 21st century, it is these assumptions, principles and characteristics that will inform new theoretical frameworks, models and concepts needed in distance education.

The challenge the field of distance education faces is the construction of theories addressing specific components and concerns of postindustrial distance education. For example, the creation of distance education theory that informs and explains computer mediated communication is both an opportunity and challenge. Asynchronous collaborative learning may well be the defining technology of the postindustrial era of distance education. It has been argued that this technology, along with audio and video conferencing, represents a paradigmatic shift in distance education, making it possible to adopt collaborative approaches to learning at a distance (Garrison, 1997). However, this challenge and opportunity for theoretical development are associated with the reality that this medium is based upon written communication. Asynchronous written communication represents very different characteristics than real-time verbal communication. The former encourages reflection and precision while the latter is spontaneous and fleeting. While distance education practice has relied heavily on print, only recently have distance education theorists begun to recognize the unique characteristics of text-based communication and realize that such communication may impact the facilitation of learning outcomes in different ways (Garrison, et al., 2000; Peters, 2000).

Theories must be developed that speak to the needs and concerns of new audiences. One of the new audiences is traditional higher education institutions which have a strong interest and stake in adopting distance education approaches but are in conflict internally (Garrison & Anderson, 1999). Higher education institutions are concerned about compromising their values and the

educational quality associated with a highly interactive and adaptable educational transaction. For this audience, the perception of distance education is that of the industrial model, which is anathema to their idealized (but seldom approached) teaching-learning assumptions and values. Models and approaches need to be developed that will address legitimate institutional questions and provide a vision and approach consistent with the values and goals of these institutions.

Conclusion

Theory provides a means (order and explanation) to make sense of complex practices and phenomena. The need to make sense of complexity is compounded in the context of distance education. Ideally, theory can describe current activities and provide direction for new approaches. Moreover, meaningful and relevant theory is essential to the vitality and influence of any field of practice – distance education is no exception. However, I would suggest that distance education is theoretically challenged to provide insightful frameworks that will guide us in what is, most assuredly, a new era of distance education.

The essential finding here of the brief review of prominent theoretical contributions is that, until recently, most distance education theory was dominated by organizational and structural assumptions. Concerns with the standardization of a product outweighed issues related to the adaptability of the educational transaction. While attempts were made in early distance education theories to address transactional issues, they were made to fit the Procrustean bed created by the industrial and structural assumptions of the era. However, much has changed during the last decade of the 20th century with the focus switching to facilitating the teaching and learning transaction at a distance.

The challenge for distance education theorists in the new century is to provide an understanding of the opportunities and limitations of facilitating teaching and learning at a distance with a variety of methods and technologies. This will demand theories that reflect a collaborative approach to distance education (i.e., as opposed to independent learning) and have at their core an adaptive teaching and learning transaction. Distance education will be characterized by an adaptability of design before and during the teaching and learning process made possible by affordable and highly interactive communications technology. This adaptability in designing the educational transaction based upon sustained communication and collaborative experiences reflects the essence of the postindustrial era of distance education. At the same time, this fundamental shift in focus reveals the challenge facing distance education theorists if they are to remain relevant and broaden their influence in the adoption of new and emerging distance learning approaches and technologies. Theory in distance education must evolve to reflect current and emerging innovative practices of designing

and delivering education at a distance.

The relevance as well as explanatory and predictive power of the theories developed will determine the recognition, credibility and influence of any field of practice. For distance education this means that theoretical developments must reflect changes taking place in the field of practice. When the theory of distance education catches up to recent developments in the practice of distance education, then the focus can shift to predictive models with the potential to shape future practice. In the medium term, however, we are likely to see a range of theories directed toward specific technological and educational needs and purposes. Grand theoretical syntheses may not be a realistic immediate goal of an emerging field of study such as distance education. It remains to be seen whether a masterful and comprehensive theory encompassing the structural characteristics of the industrial era along with the transactional properties of the postindustrial era of distance education can be realized.

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