

## **A Cross Sectional Review of Theory and Research in Distance Education**

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The field of distance education is a dynamic and growing field with frequent contributions to the literature. The intent of this review is to provide the reader with a survey of relevant literature covering key concepts and current research in the field of distance education.

The first article by Kanuka et al. was selected because it addressed the issue of university faculty's perceptions regarding text-based discussion in distance education courses. Moore's (1972) theory of transactional theory served as the theoretical framework for the discussion of the research results. Berge's (1995) conceptual framework was used to guide semi-structured interviews with faculty. The authors summarized Moore's (1972) theory of transactional distance. This theory is based on three major variables—dialogue (the interaction between the participants), structure (the elements of the course design), and autonomy (the elements of learning that are under the learner's control). Transactional distance is smallest when dialogue and structure are maximized but autonomy is lessened. Autonomy and transactional distance are positively related. It is assumed that an optimal blend can be achieved when the independence level of the students is known. The authors also reviewed the definitions of the four roles of the instructor in Berge's (1995) framework (technical, managerial, social, and pedagogical). This was qualitative research. Instructors were asked how teaching an online course impacted the way they taught. Four basic questions guided the semi-structured interviews:

1. What new skills did you have to learn?
2. What classroom management issues were involved and how were they resolved?
3. What was done to foster interaction between the participants?
4. How did your experiences teaching an online course compare with prior teaching experience?

Twelve instructors in the adult education department were interviewed before and after teaching distance education courses over a two-year period. About half of the instructors had no experience with distance education or internet communication technologies. Two of the instructors did not have much experience teaching traditional courses. NUD\*ist software selected key words and searched for commonalities. Themes were organized according to Berge's 4 roles (which were also reflected in the four questions).

Before teaching the online course, most faculty were concerned about technological issues and creating collegial relationships. They found that the technological issues were the easiest to overcome. They also felt that teaching online required more organizational skills and structure than face to face courses and that the courses were less flexible as a result. It was not as easy to make adjustments based on student feedback in the online courses. However, the faculty seemed to feel that the structure was beneficial for the students. They also reported seeing the students as e-mail addresses or "little red flags" rather than people and they missed seeing the physical features, paralinguistic cues, and other types of changes that people make over a semester. The most troubling issue reported was a lack of spontaneity in group communications. Instructors also reported difficulty in knowing when to give feedback to

the group and when to give it individually by e-mail. The authors conclude that what is needed (but not yet widely available) is a way to incorporate more flexibility in online postsecondary courses. New instructors tend to be more willing to look for new ways to make their online courses more flexible.

Conrad dealt with the nature of online community. The author used a constructivist approach to think about building a community through social interaction and communication. The author reviewed literature relating to the concept of constructivist research as self-reflexivity to justify the qualitative methodology used. Literature was reviewed to define community as “a collection of people with a particular social structure . . .[and] a sense of belonging (Conrad, xxxx, p. 4)” and virtual communities as “social aggregations that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace(p. 4).” The major question of interest in this study was “what influences members’ contributions to, and participation in, online learning activities?” Seven participants in an undergraduate program in adult education were interviewed in their study spaces regarding their reflections on building and participating in an online learning community. The participants were members of a cohort group that began their program together, but they did not necessarily take the same courses at the same time. Other people also enrolled in some of the courses, so the group membership was dynamic. The researcher also asked follow up questions via telephone and e-mail as she reflected on her analysis of the data. The author’s field notes also served as a source of data. The author looked at several themes that emerged from the interviews. These included the participants’ attempts to define community, the importance of meeting face

to face at the beginning of the program, the effort required to build and maintain a harmonious community, the role of off-topic conversations, and the perceptions of the role of self and others as members of the community. Online learning communities that are formed as the result of participation in formal education activities differ from online learning communities that result from a shared interest or goal. Participants in distance education do not have the luxury of remaining anonymous and they are usually expected to participate in the online community. This puts pressure on the participants to contribute to the discussion and use good manners. Participants felt inhibited about the online discussions because their printed words remain visible after the discussion ends. Some students resent the amount of time required to participate in the online community, especially in the beginning, but attitudes generally evolve to feeling comfortable with a familiar group of participants as they get to know each other well. The author made a convincing case for using qualitative research to explore the variables that are involved in building and maintaining an online learning community. The process was explained well and the findings generated testable hypotheses.

The framework Dooley et al. presented was intended to describe the perceptions of faculty members in relation to competence, value, and information technology support by philosophical position towards distance education. According to the authors the field of distance education is in need of a change and modifications in the faculties role in teaching at a distance. This study is going to describe the faculty members at the College of Agriculture and Life Sciences by their philosophical disposition towards distance education in the three areas previously listed. An extensive listing of the previous research done in this field was listed and detailed a variety of opinions on the subject of

distance education. Authors were cited in areas from the need for changes in teaching style (Dillon & Walsh, 1992) and technique, to faculty resistance (Gunawardena, 1990). Much discussion was made of the teachers perceived or actual competence with technology and their discomfort with methodology (Dooley & Murphy, 2001). One surprising point was brought out by the literature review was the competency of the non-tenured assistant professors, suggesting the trend to hire faculty more inclined to use distance education (Dooley & Murphy, 2001). The specific objectives of the study were as follows:

- 1) To describe and examine teaching faculty by philosophical position towards distance education (objective 1).
- 2) To examine differences in distance education competency score by philosophical position to distance education (objective 2).
- 3) To examine differences in distance education value score by philosophical position towards distance education (objective 3).
- 4) To examine differences in distance education information technology and support score by philosophical position towards distance education (objective 4).

For this study distance education was defined as an educational method in which the teacher and student are separated in time or space for the majority of the learning process. The College of Agriculture faculty was used for the sample group in this study. Three hundred and thirty one faculty members were included in the initial sample, 16 of those members did not provide documentation and the sample group was then set at 315. Of the initial surveys sent out, within two there was a return rate of 62%. Following another

mailing of the surveys to those who did not respond, along with a follow up e-mail reminder and phone call, a final response of 80% was established. The instrument used to collect the data was a two-part questionnaire, designed to be automatically scanned into a digital file by an OCR (optical character recognition) scanner. A five-point Likert scale was used, with responses ranging from; 1-strongly disagree to 5-strongly agree.

Part 1 of the survey identifies 3 specific areas:

- 1) Personal characteristics of the respondents
- 2) Professional characteristics of the respondents
- 3) Philosophical positions towards distance education

Part 2 of the survey measures the distance education components of competence, value and information technology and support, 28 statements were used to evaluate these areas.

- 1) Competence refers to the level of ability, perceived or otherwise, that faculty members had in the area of electronic technologies associated with distance education.
- 2) Value refers to the relative importance the faculty members believed these technologies currently have or will have in the future on education.
- 3) Information technology and support refers to the availability of technological resources and training and the extent to which they will aid in the progression of technologically mediated instruction.

Findings for Objective 1: A majority of the teachers surveyed were not philosophically opposed to distance education. Objective 2: Faculty members perceived level of competence was the same in spite of philosophical differences they might have had regarding distance education. These results indicated a neutral effect in regards

toward their competence with distance education. Objective 3: As might have been predicted, teachers with no philosophical opposition to distance education had higher scores in regards to the value of distance education. Objective 4: The faculty regardless of their inclination towards distance education perceived the level of support and information technology the same with little variation in their scores.

Stacy and Rice reported on an evaluation focused on students' learning processes and outcomes in an online learning environment established for postgraduate education students. The literature consists of a large amount of studies conducted on the usefulness of computer conferencing. A few of these were based on the constructivist theories, focusing on interactive online discussions as being of major importance to the success of online learning and construction of knowledge. Other authors defined the online groups as a community of inquiry, and then divided the analysis framework into three basic elements: cognitive presence, social presence and teacher presence. The research questions addressed how computer conferencing is used in teaching and learning for sharing ideas and constructing knowledge? How do students in the unit interact online? How have students perceived the effect of online interaction on their learning? An action inquiry process of plan, act, describe, and review was used as an underlying framework for this evaluation. The final evaluation group was 17 part time students, 3 men and 14 women, most aged between 40 and 50 years, and working full time. Qualitative and interpretive approaches were the major emphasis of the study, do to the need to summarize and analyze the data. The data being analyzed was the interaction among students and the effect it was having on their learning, and included the following: a voluntary on line focus group conference, online observation, analysis of conference

message content, calculation of frequency and distribution of message use, comparison of students' results and interaction frequency, a summative online discussion. Student feedback supported the use of online conferencing in encouraging a learning community with teacher presence seen as central to this. Frequency analysis showed that required online involvement generated high frequency of messaging, a high teacher time requirement that needed more management with responsibility given to students. Patterns of communication showed that high teacher interaction encouraged high student response but in small groups this was devolved and required less teacher interactivity. Tasks designed for online discussion generated online interaction with a cognitive focus. Content analysis pointed to the role and importance of the conferences for social interaction and administrative sharing as well as for a cognitive focus. Summative discussion was a key evaluation innovation and confirmed previous findings establishing the reliability of formatively gathered results. Students perceived the value of considering other students' perspectives, ideas and resources as a major component of their successful learning online.

This article by Lee employed an organizational theorists' point of view in examine the reciprocal relationship between instructional support and employee's effort.

Researchers suggested that the perception of organizational culture and climate have a strong impact on employees' attitude toward their jobs, and it influences their motivation and commitment in improving job performance. Researches in organizational support and faculty perceptions in higher education have been lacking. Only a small number of studies dealt with faculty motivation and commitment, and these studies concluded that a supportive environment and equitable reward system increased faculty commitment and



motivation. However, Csikzentmihalyi also identified intrinsic reward including the process of education and teaching subject as important factors. As in higher education institutions, the author cited that distance education was perceived as inferior teaching as supposed to face-to-face traditional classroom that resulted in the lack of instructional support. Also the determining criteria on faculty promotion, tenure, and salary were weighted more on excellence in scholarly activity rather than excellence of teaching. As a result, lack of recognition and instructional support can be a deterring factor for distance-learning instructors. **The question asked was; Is there a relationship between perceived organizational support of teaching at a distance and faculty motivation, commitment, and satisfaction?** Cross-sectional design was employed in this research with subjects of distance teaching faculty and administrators providing instructional support in 35 institutions that participated in the Western Cooperative for Educational Telecommunication (WCET). The instrument used in the study was a 5-point Likert scale with 35 items measuring course redesign, course facilitation, use and application of distance technology, teaching method, evaluation, technology needs, rewards, incentives, and personnel of instructional support. Survey questionnaires were distributed on web to all WCET members. 237 faculty from 25 institutions responded to the survey that accounted for 72% response rate. The reliability of instrument for all the items was computed using Cronbach's alpha, an internal consistency reliability estimate. The value for the coefficient alpha was .93.

Descriptive statistics identified means of faculty's overall responses to instructional support. One way quantitative Multivariate Analysis of Variance (MANOVA) was performed to further investigate statistical differences between two groups of high and

low perception on instructional support (IV) in predicting their commitment, motivation, and satisfaction (DV). The research results indicated the followings:

- 1) Overall the faculty commitment and motivation were remarkably high, and the satisfaction was medium. Faculty were found not satisfied with their teaching in spite of their high commitment and motivation
- 2) Faculty perceptions on instructional support were medium to low.
- 3) Statistical difference was found between high and low perception groups in predicting commitment, motivation, and satisfaction with small to medium effect size. The result indicated that high perception group on instructional support had stronger commitment, and higher motivation, and more satisfied with their job.

Flexibility was a key construct was the issue addressed by Collis et al. The concept of workplace-based, "just-in-time learning" is used as the conceptual framework for a major international corporation as standard in-house training model. In addition, constructivist approach to learning from an educational perspective, theories and experience with adult education is also employed in developing more flexible learning and training alternatives. The literature reviews of this article discussed research findings mainly in four aspects: training, economical psychological, and educational perspectives. Just-in-time learning enables learners to access integrated learning materials, information banks, communication channels, and tools as a form of flexible training for their work performance. From the economic perspective (macro and micro), new technologies enable more flexible training methodologies can lead to productivity gains at three levels: the learner, the organization, and the society or region. From a psychological perspective,

learners are able to exercise more control over their learning choices in meaningful problems in a more flexible learning situations. From an educational viewpoint, adult learners learn more effectively by relating their own learning history, transferring value to their work, and becoming efficient on their time and energy. The authors asked the questions:

- 1) How can communication technologies be utilized to make training more flexible?
- 2) What problems and issues will confront the learner, the instructor, the course developer, the learning-material developer, the training manager, the employer, the traditional training sector?
- 3) In the context of these problems and issues, what are the most implications of increasing flexibility in training?

The methodology used in this article is a case study on TeleScopia project, one of four successful consortia in a 1994 European-wide competition in open, distance, and flexible learning stimulated by the Commission of the European Community. Qualitative analysis of program descriptions and reflections from final report of TeleScopia project is employed in answering the above three research questions related to flexibility. The research results indicated the following:

- 1) Communication technologies increased the range of possibilities for communication within the TeleScopia courses, but were not presented as options among which the students could make the choice.

- 2) With regard to learner flexibility to instructional organization, none of the courses explicitly offered learners as a choice of individual or group orientation.
- 3) In addition, it is expensive to increase flexibility both in terms of technical aspects and human costs.

More flexibility required the instructor to respond rather than plan and deliver, to change or adjust pedagogical patterns, and to demand more time and effort. To the learners, more flexibility brings independence but also the need for more self-direction, and self-motivation. For organizations, the majority of the costs for flexible training are the burden of the organization. The major contribution of TeleScopia project is to synthesize a wide range of experiences around the common issue of flexibility and the technical services as a useful preliminary study to test more flexibility-more productivity hypothesis.

The next author Huang reviewed constructivism and adult learning theory and then connects the two for suggesting an appropriate theoretical approach to online learning. They began with the definition of online distance education as a separation of learner and instructor and included design of the course as an element of the definition. The author reviewed the theory of constructivism basically referring to Dewey (1916), Vygotsky (1978) and Bruner (1979). From these perspectives the author views constructivism as a learner actively engaged in the learning process and building new knowledge based on prior experiential knowledge with the instructor fulfilling a facilitator role in the student “solving their real life problems (Huang, 2002, p.29).”

Knowles theory of androgogy was the focus of the review of adult learning theory, and the six principles of androgogy are provided:

- 1) the learner's need to know how learning will take place, what learning will occur, and why learning is important
- 2) the learner taking control of techniques and purposes of learning
- 3) the rich resource of prior learning, the preconceptions and biases, and the learners self-identity
- 4) the determination of readiness to learn
- 5) the problem solving orientation to learning and the presentation of information in a real-life context
- 6) motivation to learn.

The author also references Lieb's work in recognizing that because of heavy schedules and responsibilities adults generally need a higher level of motivation in order to make the investment necessary to learn.

The author then covers the online technologies that online learners use as "intellectual partners (Huang, 2002, p.30)." Some writers would refer to this as the distribution of cognition through the use of cognitive mediating tools, or the provision of affordances as mediating artifacts (Salomon 1993). In the view of the author these tools allow the learner to

- 1) articulate what they know;
- 2) reflect on what they have learned;
- 3) support the internal negotiation of meaning making;
- 4) construct personal representations of meaning; and

5) support intentional, mindful thinking.

In speaking to the constructivist approach to online learning the author covers seven issues of concern. First, the concern for humanity and the learner's isolation, which we usually refer to as social presence. Second, the learner's determination of the quality and authenticity of their learning. The instructor's role as a facilitator of instruction is the third issue. The fourth issue, pre-authentication addresses the design principle of trying to make the instruction real world applicable prior to presentation to the learner. The fifth issue, attempting to evaluate the learner's achievements is one not only of identification but an issue of measurement. The sixth, the need to design for learner centeredness, or individualizing the curriculum. The final issue addressed is a major concern for collaborative learning must be juxtaposed against individualized learning.

The author concludes that the advances made by technologies are "decreasing the barriers of traditional distance education comprised of interactive or communicative problems" and that "constructivist principles provide ideas to help instructors create learner-centered and collaborative environments that support critical reflection and experiential processes (Huang, 2002, p.34)."

Bargeron looked at the institutional context of distance education and training and wrote from the perspective that interaction between students and content can be improved for on-demand education through software that enables the viewer of multimedia to annotate the course content as it is used. The software is designed to enhance the learner experience of the multimedia and to capture the annotations of all students even though they are engaging that content in asynchronous fashion. The original software was tested in the corporate training context. The literature review focused on a review of software

and projects for annotation that are currently available and the shortcomings of that software and those projects. That a software capability of annotation combined with an e-mail capability of questioning would enhance the community and interaction of students engaged in multimedia asynchronous courses. Lab studies were conducted to compare handwritten note taking, software annotations using both typing and voice. The software was then tested in a live programming training course over a corporate intranet such as a student would be involved in corporate training. A face-to-face class was observed and video tape used as on-demand education training courses then compared the multimedia web based course with the same content to the face-to-face course. Data was gathered through surveys containing Likert scale questions and open ended questions. Data was also gathered while the student was engaged in the training. The final research was conducted using collaborative exercises, one group meeting together and using the annotation software, another functioning asynchronously and using the annotation software and a control group not using the software. The participants were randomly assigned to the groups and at the end of the exercise the groups filled out questioners.

The first data was analyzed on the basis of the statistics gathered during the lab simulations of course content delivery (number and quality of annotations made using the software versus pencil and paper method of note taking). The data gathered from the surveys of students completing a class was analyzed with ANOVA statistical procedures. The first data showed that people took the same number of pencil and paper notes as with the MRAS software, though it took longer to make the notes with the original software. All the first test participants communicated that the MRAS note taking was better in organization and content than pencil and paper. The MRAS audio annotation feature was

discontinued because of the slow response time for voice recognition software to translate the data into the annotation database. The research also found that the number of annotations increased as the training proceeded through time, which was the opposite of what had been expected. The designers felt that as questions were asked and added to the database that the number of annotations made by later students would decrease, the test results indicated interaction increased. When the live course was compared against the on-demand course in the second iteration of testing the drop out rate for the live course was 58% versus 40% in the on-demand course. The students also reported no difference in the quality of the interaction between the two courses. The ANOVA indicated there was a significant statistical number of students in the on-demand training that valued their co-learners comments in the annotations. There was no difference in the satisfaction of the students with the delivery formats (though  $p = .055$ ). In the simulate exercise of collaboration the asynchronous group made significantly more annotations, half of which were interactions with their partners. The asynchronous groups appeared to be more focused in their interactions than did the face-to-face group and the asynchronous group seemed to have more trouble resolving their disagreements. The results of this research seem to indicate that there is a possibility of enhancing learner engagement and collaboration when using multimedia training and education methods when the content is accompanied by software that allows additive annotation and questioning of instructor and others through e-mail interface. This was a well written corporate report of research within the institutional context of corporate training.



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