A Cross Sectional Review of Theory and Research in Distance Education

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The field of distance education is a dynamic field which includes a growing body of research. The field of distance education raises many questions which encompass the spectrum of human and technological questions of interest to those of us who practice various forms of distance education. As doctoral students in the field of distance education, we were interested in developing a systematic approach for studying the current problems in this diverse field. We organized the literature into the seven research categories of research including conceptualization, learners and learning, technology and designing instruction for distance education, faculty in distance education, policy, administration and management, institutional contexts, and international contexts. We then each searched the literature and prepared annotated bibliographies for selected research within each category. We then selected a series of articles which we deemed appropriate and comprehensive. Many of the article that were chosen have been seen as useful both administrators in higher education and secondary education.

Conceptualizing Distance Education

Kanuka, H., Collett, D., & Caswell, C. (2002). University instructor perceptions of The use of asynchronous text-based discussion in distance courses. The American Journal of Distance Education, 16(3), 151-167.

Theoretical/Conceptual Framework

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.

Summary of Literature Review

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).

Research Questions/Hypotheses

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?

Methodology

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.

Methods of Data Analysis

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).

Findings

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 email 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.

Total Number of Citations: 18

Learners and Learning

Conrad, D. (2002). Deep in the hearts of learners: Insights into the nature of online community. Journal of Distance Education, 17(1), 1-19.

Theoretical/conceptual framework

The author uses a constructivist approach to think about building a community through social interaction and communication.

Summary of literature review

The author reviewed literature relating to the concept of constructivist research as self-reflexivity to justify the qualitative methodology used. Literature is reviewed to define community as "a collection of people with a particular social structure . . .[and] a sense of belonging" (p4) 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).

Research Question

The major question of interest in this study was "what influences members' contributions to, and participation in, online learning activities?"

Methodology

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 email as she reflected on her analysis of the data. The author's field notes also served as a source of data.

Data Analysis

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.

Findings

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.

Total Number of Citations: 35

Stacey, E. and Rice, M. (2002). Evaluating an online learning environment. Australian Journal of Educational Technology, 18(3), 323-340.
http://www.ascilite.org.au/ajet/ajet18/stacey.html

Theoretical/conceptual framework

This paper reports on an evaluation focused on students' learning processes and outcomes in an online learning environment established for postgraduate education students.

Summary of literature review

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.

Research question

- How is the computer conferencing 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?

Methodology

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.

Methods of data analysis

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

Findings

- 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.

Total number of citations: 23

Technology and Designing Instruction for Distance

Miller, M. D. & Corley, K. (2001). The effect of e-mail messages on student participation in the asynchronous on-line course: A research note. Online Journal of Distance Learning Administration, 4(3), http://www.westga.edu/~distance/ojdla/fall43/miller43.html

Theoretical/conceptual framework

This article describe a study of an instructional design mechanism designed to reduce student procrastination. The basic research question is rooted in behaviorism. The authors are affiliated with the College of Business, Augusta State University.

Summary of literature review

The authors reviewed literature that suggests that procrastination is one of the main reasons students fail to complete coursework and literature that suggests that feedback regarding participation and activity level can help students modify their behavior appropriately. They also reviewed research that suggests positive e-mail messages are related to students' perception of the instructor as caring and that negative e-mail messages are less likely to be taken personally than negative comments delivered in person.

Research Question/Hypothesis

Does the e-mail feedback regarding student activity and participation levels in an online course encourage students to increase their activity and participation levels? Does the type of e-mail message matter?

Methodology

Participants were students in a information systems online summer school course. Student activity in the online course modules was measured and summarized every five days. Each reporting period, students were assigned to one of five categories based on activity level and a corresponding e-mail message was sent to the students. Students with little to no course activity were sent negative messages while students with a moderate amount of activity were sent slightly negative messages. Students who spent enough time to be successful received positive messages while students who spent a significant amount of time received very positive messages.

Methods of Data Analysis

The change in activity level following e-mailed feedback was the dependent variable in a simple regression analysis. The type of feedback was the predictor variable. Each week's data for each student was treated as an independent data point. The regression equation was used to predict the change in activity level for each category of feedback.

Findings

For students who had a low participation level, negative feedback about their performance resulted in increased activity for the next reporting period. For students who had a satisfactory level of participation, positive e-mail messages did not increase their activity level.

Total Number of Citations: 23

Bargeron, D, Gruden, J. Gupta, A. Sanoki, E. Li. F. & Leetiernan, S. (2002) Asynchronous collaboration around multimedia applied to on-demand education. Journal of Management Information Systems. 18(4), 117-145.

Theoretical/conceptual framework

This article is written 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.

Summary of Literature Review

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.

Research question/hypothesis

That a software capability of annotation combined with an email capability of questioning would enhance the community and interaction of students engaged in multimedia asynchronous courses.

Methodology

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 taped 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 suing 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.

Methods of Data Analysis

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 student completing a class was analyzed with ANOVA statistical procedures.

Findings

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 email interface.

Total Number of Citations: 41

Faculty in Distance Education

Dooley, K.E., Jones,E.T., Lindner, J.R., Murphy, T.H., (2002). Faculty Philosophical Position Towards Distance Education: Competency, Value and Educational Technology Support. Online Journal of Distance Learning Administration, 5(1)
http://www.westga.edu/~distance/ojdla/spring51/jones51.html

Theoretical/conceptual framework

The framework of this study was designed 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.

Summary of literature review

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).

Research question(s) or hypothesis

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).

Methodology

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 embers 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.

Methods of data analysis

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:

- Personal characteristics of the respondents
- Professional characteristics of the respondents
- 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.

- Competence refers to the level of ability, perceived or otherwise, that faculty members had in the area of electronic technologies associated with distance education.
- Value refers to the relative importance the faculty members believed these technologies currently have or will have in the future on education.
- 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

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 an 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.

Total Number of Citations: 17

Policy, Administration and Management

Chizmar J. F. & Williams D. B. (1998) Internet delivery of instruction: issues of best teaching practice, administrative hurdles, and old-fashioned politics. Campus-Wide Information Systems 15 (5), pp164-173

Theoretical/conceptual framework

Chickering and Gamson's (1987) seven principles for good teaching practice were used as the pedagogical approach for Internet courses. Active learning techniques employed in the online course were chosen to substitute for the lack of visual cues for human interactions.

Summary of literature review

The literature reviews of this article discussed seven principals for good teaching practice by Chickering and Gamson. These seven principles are:

1. encourage contacts between students and faculty;
2. develop reciprocity and cooperation among students;
3. use active learning techniques;
4. give prompt feedback;
5. emphasize time on task;
6. communicate high expectations; and
7. respect diverse talents and ways of learning

Research question

What are the pedagogical, administrative, and political issues involved when pioneering and developing Internet courses?

Methodology

This is a qualitative research of case study using techniques of surveys and interviews in attempt to demonstrate the process and issues involved in developing Internet courses. Two different course subjects, Statistics and Fine Arts courses were chosen to present the pedagogy and techniques used in online version. In addition, there were total nine instructors including the authors who received a campus Internet teaching grant program and seven of those were surveyed to understand administrative obstacles and political issues they encountered in offering Internet courses.

Methods of data analysis

Instructors' experiences in developing the Internet courses are the major focus of this study. Online course contents and documents were analyzed to explain pedagogical issues. Instructors were also surveyed and quotes were used to provide insights for administrative and political barriers when pioneering Internet courses.

Findings

The research results indicated the followings:

> Pedagogy:
> Statistics course employed a collaborative classroom/laboratory approach as active learning pedagogy, while Fine Arts course allowed both internet and on campus students participating in the same class and class activities.
> Both subjects involved considering time on instructor's part to develop course materials and resources for students.
> Administration:
> Lack of an infrastructure to support Internet-only teaching regarding issues in registration and admission, geographic restrictions, technical support, campus Internet literacy, security and authentication of work and grading, access to computer equipment and software, and issues of copyright and protection of creative effort.
> Politics:
> Lack of support for encountering the barriers of overwhelming time demand on instructors and the reward structure used to evaluate Internet teaching.

Total Number of Citations: 4

Institutional Context

Sharpe, R. & Bailey, P. (1999) Evaluation and design of technologies to meet learning outcomes. Journal of Computer Assisted Learning 15, pp179-188

Theoretical/conceptual framework

This article focuses on the importance of continuing professional development (CPD) for staff in higher education. Institutions are called upon to provide relevant programs of development for their staff.

Summary of literature review

The authors didn't cite much literature for this article. Basically, the Dearing report in 1997 was used to emphasize on the important of CPD and it also encourage institutions and departments to include postgraduates as potential teaching staff in the training.

Research question

What do the general themes emerge from the outcomes of a graduate teaching assistants course to evaluate the effectiveness of using a computer conferencing system?
How to use outcomes to redesign, to a web-based open learning system, the teaching and learning in a higher education course for teaching staff?

Methodology

The technique of case study was used to explore the learning outcomes of CPD. One case focused on computer conferencing system targeting Graduate Teaching Assistants (GTAs), and the other one emphasizes on a web-based open learning system for teachers in higher education. For the computer conferencing system, focus group was conducted to gather the information. On the other hand, the open learning system were evaluated by annual reviews of Teaching and Learning in Higher Education (TLHE) including feedback from participants, the program team and external examiners.

Methods of data analysis

The authors used qualitative data analysis for this article. The GTAs course consisted of four workshops in a semester. FirstClass conferencing system was used as training platform. All course messages including weekly reflective logs, comment on teaching observations, generated questions and case study discussions were recorded for analysis. Total of 372 messages were coded independently by the primary author and another colleague. As for the TLHE program, portfolio of evidence was assessed to determine the outcome of the program.

Findings

The research results indicated the followings:

Graduate Teaching Assistants:

> Six themes emerge from the study including sharing of personal experiences, drawing on the course, requesting and giving feedback, generating ideas, building on previous messages, and reflection.
> Participants were able to share personal experiences and give and request feedback form one another and engage in group discussions.
> The system reduced social isolation and provide supportive place to work.
> The system helped participants develop reflective practice.
> Teaching and Learning in Higher Education:
> The outcome led to the development of a set of guided open learning materials that gave participants a structured approach to the design and implementation of new teaching, learning, and assessment strategies.
> The networked system allowed the participants to share and document their progress in their electronic portfolios.

Total Number of Citations: 10

International Contexts

Collis, B., Vingerhoets, J. & Moonen J. (1997) Flexibility as a Key Construct in European Training: Experiences from the TeleScopia Project. British Journal of Educational Technology 28 (3), pp199-217

Theoretical framework

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.

Summary of literature review

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 (marcro 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.

Research question

> How can communication technologies be utilized to make training more flexible?
> 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?
> In the context of these problems and issues, what are the most implications of increasing flexibility in training?

Methodology

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.

Methods of data analysis

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.

Findings

The research results indicated the followings:

> 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. With regard to learner flexibility to instructional organization, none of the courses explicitly offered learners as a choice of individual or group orientation. 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.

Total Number of Citations: 23

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