

CHAPTER 5: DISCUSSION AND RECOMMENDATIONS

Summary

This mixed method study addressed the question: Which online learning structure - constructing knowledge one-on-one with an expert mentor, constructing knowledge with peers and a facilitator, or constructing knowledge with peers alone - most positively impacts learners' attitudes, beliefs, and knowledge outcomes?

Participants were 46 graduate students in the Integrating Technology in Schools (ITS) program at GMU. Participants were enrolled in Technology and Leadership, a three-credit course designed to explore the relationship of leadership, change, and technology advocacy.

The treatment was the 10-week, online portion of the course. Participants were randomly assigned to one of three groups. In the Mentored group, learners constructed knowledge individually with an expert mentor. The learner and mentor conducted a dialogue, via email, concerning the course materials, reflections, and the creation of the Personal Leadership Plan (PLP). In the Facilitated group, three small groups of learners constructed knowledge with peers and an online facilitator. Students in this group discussed assignments and readings using an asynchronous discussion forum. They also used the discussion forums to complete tasks collaboratively. The facilitator for the group participated in the discussions and assignments providing guidance and insight. The

Instructor group was comprised of three small groups of learners and an instructor. In these groups, learners constructed knowledge with peers alone. Communication among the peers occurred via discussion boards. The instructor did not participate in discussions. Members of these small groups worked collaboratively on assignments and then submitted them to the instructor for assessment.

Chang & Fisher's (2001) Web-Based Learning Environment Inventory (WEBLEI) was used to answer the first sub-question of the study: Is there a difference in learner attitudes concerning the efficacy of their online experience between the three groups - constructing knowledge with peers and a facilitator, constructing knowledge one-on-one with an expert mentor, and constructing knowledge with peers? Participants were asked to complete the survey prior to the beginning of the treatment. This was done to confirm comparability of the three treatment groups. An analysis of variance procedure was done on the pretest scores, and no significant differences were found between the groups. Once comparability was established, the participants were asked to complete the survey at the conclusion of the treatment.

Preliminary analysis of these scores revealed a flaw in the scoring. Several of the questions on the survey were deemed inappropriate for comparison because they addressed the degree to which participants communicated with peers. Since the members of the Mentored group, by design, did not communicate with peers at all, it was established that their answers on certain WEBLEI questions skewed the mean scores. The responses to those questions were eliminated for all participants.

A new ANOVA procedure revealed that the scores for the Mentored group were significantly different in the Results subsection from those in the Facilitated group and the Instructor group. The Results subsection addresses issues such as how well the web-based learning materials are structured and organized, whether the materials presented follow accepted instructional design standards such as stating its purpose, describing its scope, incorporating interactivity, and providing varied formats to meet different learning styles.

The second question of the study was: Is there a difference in learner perception of the roles and responsibilities of a leader between the three groups? In order to answer this question, participants were given Pozner and Kouzes' (2001) Leadership Practices Inventory (LPI). The LPI measures five practices demonstrated by successful leaders: Challenging the Process, Inspiring a Shared Vision, Enabling Others to Act, Modeling the Way, and Encouraging the Heart. As with the WEBLEI, participants were asked to complete the survey prior to the beginning of the treatment. Again, this was done to confirm comparability of the three groups. An ANOVA procedure was done on the pretest scores, and no significant differences were found between the groups. Once comparability was established, the participants were asked to complete the survey at the conclusion of the treatment. An analysis of variance procedure done on the posttest scores showed no significant differences between the three groups at the conclusion of the leadership course.

The third question of the study was: Do learners' perceptions of the roles and responsibilities of a leader change after completion of the leadership course? To address

this question, a paired samples t test procedure was used to evaluate the changes in the LPI, within each of the three groups, between the pretest and the posttest scores. The results of the analysis showed that the Mentored group's scores changed significantly in four of the five of the subsections of the LPI, specifically: Challenging the Process, Inspiring a Shared Vision, Modeling the way, and Encouraging the Heart. It was also interesting to discover that the standard deviations decreased substantially from the pretest to the posttest for the Mentored Group. This suggests that, regardless of the mean score, the members of the Mentored group answered more consistently with each other as a result the treatment. No significant differences were noted in the pre to post test score changes for either the Facilitated or the Instructor groups.

Question four of the study was: Is there a difference in the individual final course product (PLPs) developed by individual learners in each group? All participants in the study completed a PLP as part of the course requirements. The researcher developed a rubric and, together with three other raters, scored the PLPs. To evaluate the differences between the groups, an analysis of variance procedure was done. No significant differences were found between the PLP scores for the members of the three groups.

The fifth question of the study was: Is there a difference in overall course satisfaction between the three groups? This was measured using the University's Instructor and Course Appraisal survey. The mean scores for this instrument were analyzed using an ANOVA procedure. No significant differences were found between the course evaluation scores of the three treatment groups.

The final question of the study was: Is there a difference in learner reflections on their online learning experiences between the three groups? To answer this question, six participants, two from each treatment group, were asked to participate in interviews. During the interviews, the participants were asked to discuss what they had learned from the course and the activities that they found beneficial or detrimental to learning. They were also asked about the structure of the course and how it either helped or hindered their learning about leadership. The interview participants generally had good things to say about the course structure for their group. However, they also illuminated a number of factors that they felt were hindrances to learning. When asked to summarize what they had learned in the course, it was clear that each of the interview subjects had gained insight into the roles and responsibilities of a leader. Themes that emerged were discussed in-depth in chapter four.

Conclusions

Based on the analysis of quantitative and qualitative results of this study, I came to a number of conclusions. Those conclusions are presented and explained in this section. The conclusions are presented in two general categories: Efficacy of Online Learning Experience and Perceptions of Leadership Roles and Responsibilities.

Efficacy of Online Learning Experience

Conclusion 1: Each of the three structures for online learning - constructing knowledge one-on-one with an expert mentor, constructing knowledge with peers and a facilitator, or constructing knowledge with peers alone - provided students with a positive learning experience. There were no significant differences between the three treatment

groups concerning the efficacy of their online experience in the areas of convenience, autonomy, and efficiency (Access), flexibility, reflection, feedback, and collaboration (Interaction), and enjoyment, confidence, accomplishment, and success (Response).

Conclusion 2: The one-on-one, mentor-mentee structure provided students with a more satisfactory online learning experience in terms of interaction with the objectives, activities, content, and structure. Rather than relying solely on course content provided on web pages, students were able to gain understanding of the course through conversations with their mentors. Students in peer groups, on the other hand, do not have the same support mechanism. Rather than individualized communications with an expert, students in the Facilitated and Instructor group communicated asynchronously with peers and a facilitator or peers alone. Communication using the asynchronous discussion board did not provide for the same relationships with peers or the facilitator.

Perceptions of Leadership Roles and Responsibilities

Conclusion 3: Each of the three structures were viable modes for presenting content and promoting learning. Interviews with members of all three treatment groups indicate growth in the understanding of leadership and the roles and responsibilities of leaders.

Conclusion 4: A mentor-mentee relationship can promote richer dialogue in terms of the practical application of leadership concepts and strategies. Students learning in the mentor-mentee structure appeared more likely to adopt and implement those strategies.

Conclusion 5: The mentor-mentee relationship promoted a clearer and more concrete understanding of successful leadership practices and the flexibility to adapt

interactive conversations to various learning styles. Members of the Mentored group converged in their views of leadership.

Conclusion 6: All three of the online learning structures provided for reflective thinking and expression. In the Personal Leadership Plans as well as the interviews, there is evidence that members of all groups were able to synthesize their thoughts on leadership and then express those ideas.

Conclusion 7: Generally, interviewees from all treatment groups shared similar reflections. All groups reported satisfaction with the course structure. All groups reported similar learning experiences and learning outcomes. Five differences did emerge. One, those in the mentored group specifically mentioned the fit between their learning style and the treatment structure. Other groups did not mention learning style. Two, the mentored group expressed some desire for interactions with peers. Three, the mentored group expressed a perception that this treatment was more difficult than the facilitated and instructor treatment because they did not have opportunities to share completion of assignments with peers. Four, the facilitated and instructor groups expressed appreciation for the opportunity to collaborate with peers. Five, the facilitated and instructor groups acknowledge some challenges with group collaboration.

Discussion

The analyses of the data taken from this study illustrate the foregoing conclusions. The discussion of these conclusions and implications for online learning design fall into three distinct areas: Design, Mentor-Mentee relationship, and Cognitive Overhead.

Design

The data collected from surveys and interviews indicated that all participants, regardless of treatment group, had a positive learning experience. The scores on the Web-Based Learning Environment Instrument showed that the online experience was satisfactory for all. Interview data support this finding. While interview subjects from all three groups spoke of occasional challenges, they all indicated that they were pleased with the experience.

Scores from the Leadership Practices Inventory show that members of all three groups gained an understanding of the roles and responsibilities of leaders. No significant difference was found between the groups at the conclusion of the treatment. This is supported by the interview data.

The fact that all participants generally reported satisfaction with the course can be attributed to the overall course design. The members of all three treatment groups participated in the same activities, projects, assignments, and discussions. These component parts of the treatment course were designed to utilize constructivist practices. Brown, Collins, and Duguid (1988) write that knowledge is situated in the activities, context, and culture in which it is learned. The activities used in the course were authentic and meant to replicate problems and challenges that teacher leaders encounter in their schools and school divisions. These authentic problems and the situatedness of the design gave all students a context in which to work that was realistic and challenging. Participants from each of the three groups expressed an appreciation and enjoyment in working within the course.

Mentor Relationship

While the data suggests that all participants had a satisfactory learning experience, a number of differences were noted. These differences generally favored the Mentored group. For example, the Mentored group's scores in the Results subsection of the WEBLEI were significantly different from those of the other two groups. This subsection assessed student's perceptions of academic factors such the clarity of the objectives were clear, planned activities, appropriate content, material design and layout, and the structure of the course. Inasmuch as the course design was identical in terms of the activities, problems, and projects, the differences in scores point to the mentor-mentee relationship.

Those in the Mentored group, unlike either of the other two groups, were able to benefit from the personalized attention and conversation with the mentor. Students in the Facilitated and Instructor group did not have the means to communicate directly with an online mentor. They were able to communicate with peers and a facilitator or instructor but did not have the opportunity to directly pose questions to, or discuss assignments with, a mentor. The unique relationship between the mentor and the mentee facilitated an understanding of the course. Daloz (1999) describes the role of the mentor as that of a "trusted guide" rather than a "tour director". Consistent with that characterization, the mentor's role in this design was not one who directs the student but, through conversations, explores content with the mentee. The mentor participated in the journey. As the student encountered new challenges, they benefited from having the expert mentor available to answer questions, provide clarification, and assist in understanding leadership. Since the mentors in this case had experience in teaching, they were able to

help the students personalize the course to their teaching context. It is not surprising, then, that the Mentor group's overall rating of the Results subsection of the WEBLEI was significantly different than those in the other groups.

Additionally, Mentored participants collaborated only with their mentor, so they were freer to focus on their own concerns and personal contexts in conversations with the mentor. The mentor, in turn, was able to focus discussion on the student's concerns, difficulties, and questions. The dyad provided the freedom and flexibility to adapt the course to the learner's particular style of learning. The learner was able to ask questions of the expert and expect timely and informed responses to those questions.

Cognitive Overhead

On the LPI, those in the Mentored group showed significant differences between their pretest and posttest scores. The participants in this group accessed the course materials and assignments and then collaborated with the mentor on those activities. The differences in the results which favored those in the Mentored group can be attributed to the lower 'cognitive overhead' experienced by those participants. Conklin (1987) defines cognitive overhead as the additional effort and concentration necessary to maintain several tasks at one time when using hypertext or the World Wide Web. Users presented with a number of links to follow and various options can become disoriented. Participants in the Facilitated and Instructor groups were required to navigate through a number of levels of Blackboard while processing discussion postings, assignments, and content.

Participants in both the Facilitated and Instructor groups accessed course activities through the Blackboard course management system. Owing to the structure imposed by

Blackboard, and the overall peer-collaboration nature of the course structure, these participants were required to navigate between the various components in Blackboard to complete assignments. Once they accessed the assignments for the module, they were then required to move to the discussion board area to collaborate with others in their learning team to complete the work. This involved the reviewing and synthesizing of multiple viewpoints. In short, participants in the Facilitated and Instructor group faced a greater degree of cognitive overhead. They had to incorporate many other concerns and tasks which might draw them away from their focus on content. Participants in the Mentored group had only to access the activities and then, through email, discuss the work with the mentor. The mentor was able to reiterate, clarify, and explain the assignments and removed the necessity for those students to move back and forth between the web pages and their email. The structure of the Mentored group's course meant that the mentored participants had fewer technical tasks to complete and areas to access as well as fewer personalities and perspectives to negotiate.

Recommendations

This study led to a number of conclusions about the efficacy of the three designs used in this study. Based on the data, analysis, and conclusions of this study, I have several recommendations in this section. The recommendations fall into two categories: recommendations for the design of online courses and recommendations for further research.

Recommendations for the Design of Online Learning

1. This study suggests that each method of delivery, collaboration with peers and facilitator, collaboration with peers alone, collaboration with expert mentor, are viable for this type of course. More important is the constructivist design of the course. The inclusion of robust authentic problems, real-life situations, the opportunity for reflection and collaboration with a proactive expert differentiate this style from 'correspondence' style course designs.
2. When utilizing any of the three designs studied here, attention must be paid to the roles of the mentor, facilitator, and/or instructor. It is critical that those in the roles be knowledgeable and have the ability to promote conversation and reflection on the part of their students.
3. Designers of online learning experiences must take cognitive overhead into consideration when creating learning structures.
4. When collaborative activities are included in the design for online courses, the process for collaborating should, at least initially, be modeled or discussed by an experienced facilitator, instructor, or mentor. A common theme in the interviews was that, in the groups using peer collaboration, there was a great deal of difficulty in working together online. This collaborative process is a skill and requires strategies that need to be imparted to students concurrently with or even prior to their study of the content.

Recommendations for Future Research

The rapid and continuing growth of online learning suggests that designing appropriate, meaningful, and robust online learning opportunities will be of great interest in the academic world for some time to come. This study compared three designs for online learning and suggests the need to:

1. Design research treatments wherein the participants are exposed to various online learning designs and are thus in a position to compare them. The participants in this study had experience with online learning through other ITS courses, but a crossover study would give them the ability to compare and relate the relative merits of each.
2. Investigate other instruments. While the WEBLEI proved to be a satisfactory instrument for the most part, there were flaws in its design and in my application of it in this study. A review of current online course satisfaction instruments shows that there are not many extant.
3. Conduct this type of research in a truly 'distance education' situation. One of the difficulties I have had in researching online learning is that the participants are typically students in face-to-face classes at the same time. Thus, the students know each other, they have contact with each other, and they are able to circumvent a number of the advantages and disadvantages of the online design.
4. Design a study to investigate the correlation between online course satisfaction and learning. The results of this study looked at the issues of course satisfaction and efficacy of learning experience separately. It would certainly be beneficial to

design a study that would allow for an analysis of the correlation of learner satisfaction and learning experience. Such a study could shed light on whether or not a learner's satisfaction with an online experience promotes learning.

5. Research into the learning styles of students and the compatibility of learning styles with the various modes of online course design.

The course that was the treatment for this research represents an attempt at merging new communication technologies and emerging pedagogical theory. This study served to answer a number of questions about the design of online learning opportunities for higher education students. It simultaneously raised a number of further questions that should be investigated. The implementation of new technologies and communication tools cannot be looked upon as making online instruction easier. In fact, it will be even more complex when combined with creative, authentic, problem-centered design. Yet, the benefits of constructivist design are shown here to provide a viable means of implementing online instruction.