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Fostering collaboration and learning in asynchronous online environments

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Abstract: This case study, based on social constructivist learning theory, analyzed the quality of interaction and learning taking place during asynchronous discussions in a graduate level course by focusing on the types of instructional strategies employed to foster discussion. Qualitative and quantitative procedures were used to analyze knowledge construction processes based on previously conducted research that provided a set of indicators for replication in coding and comparison of results. The role of facilitator was closely monitored in relation to the quality of responses in regard to knowledge construction in order to determine the types of instructional strategies best suited to draw students into online discussions that are constructivist, collaborative approaches to building knowledge.

Keywords: constructivist learning; collaborative learning; online learning; computer-mediated instruction

I. Introduction.

Online and blended learning has grown significantly in recent years. Spurred by the increased interest among faculty in designing effective learning experiences, this rapid growth requires a focus on the types of instructional strategies that will best serve as effective tools to draw students into online discussions that are constructivist, collaborative approaches to creating meaning. While significant research has been conducted on the quantitative nature of online discussion participation (Henri, 1992; Harasim, 1993; Hillman, 1999), far more research should focus on what happens to learning within this environment (Schrire, 2006).

The asynchronous online discussion environment offers unique opportunities for students and instructors. Since participation is not required at a specified time, or during a structured must-be-present-window, students have the luxury of time in order to write and even re-write their responses. Without specified time constraints, students can take time to review posts, reflect on the direction they wish to move the discussion, and at their discretion, end or begin new discussion strands (De Wever, Schellens, Valcke, & Van Keer, 2006; Pena-Shaff & Nicholls, 2004). This careful deliberation and articulation of ideas has the potential to improve students' writing and thinking skills. Most importantly, this makes an online discussion a collaborative, reflective activity (Pena-Schaff & Nicholls, 2004) that is characterized as dialogic in nature (Schrire, 2006). Such interactions hold interpersonal significance and highlight the importance of learner interaction in view of knowledge construction. "The need to articulate one's own argument in this type of text-based environment encourages students to engage in analytical and reflective action. This process helps students construct purposeful arguments and transmit them

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to an audience" (Pena-Shaff, Martin, & Gay, 2001, p. 65). Careful analysis of such interactions can help determine whether or not they facilitate critical thinking and encourage the process of knowledge construction.

Within a traditional face-to-face classroom, instructors often spend time preparing students for and guiding students through appropriate, effective discussions, incorporating a variety of strategies based on the pace of the class, the reactions of students to the content and one another, and a general reading of body language and other non-verbal cues. Such discussion techniques in the face-to-face classroom are not readily transferable to the online environment. "Without having face-to-face interaction, the absence of nonverbal cues and contextual information, it is a formidable task to elicit participants' sense of social presence in a learning community with only text based asynchronous discussion board communication tools" (An, Shin, & Lim, 2009, p. 751). New pedagogical approaches must be developed and honed.

A variety of instructional strategies can be applied to encourage student learning online—especially those activities for online and blended learning in an asynchronous environment. Graduate students bring another dimension to this environment as they enter with a level of confidence gained from more life experiences and an eagerness to share that learned-in-the-trenches knowledge. They often bring an eagerness to serve in a more active role in the online environment, allowing for the instructor to become a less dominant presence. Assigning roles is a common means of generating meaningful discussion and knowledge construction (DeWever, Van Keer, Schellens, & Valcke, 2010; Baran & Correia, 2009). According to Baran and Correia (2009), it is helpful to allow for student-led facilitation strategies to overcome the challenges of instructor-dominated facilitation. An instructor as the center of discussion has the potential to create what Rourke & Anderson (2002) describe as an "authoritarian presence" (p. 4). For many instructors, it is necessary to experience a paradigm shift wherein student-dominated discussions replace instructor-dominated facilitations. According to Harasim (1990), the key differences between online and face-to-face discussions are time and place dependence, and the richness and the structure of communication. Discussion techniques frequently used by instructors in the face-to-face setting have to be modified in order to facilitate discussion in the electronic forum. Finding the most effective pedagogical approach for the online environment can be a challenging task.

The classroom setting allows for the careful development of a community of learners. This same sense of community can and should be developed in the online environment. Interaction among students in a discussion forum helps them apply and integrate new knowledge in the course of engaging in group interaction (Wang, 2010). As students construct meaning through interaction with others, they are participating in a community of learning (Rourke, Anderson, Garrison, & Archer, 2001). According to Palloff and Pratt (2007), "The learning community is the vehicle through which learning occurs online. It is the relationships and interactions among people through which knowledge is generated" (p. 15). The importance of dialogue is founded on principles of social constructivist theory. Social constructivists consider individual learning as socially mediated, incorporating such principles as active learning, self-reflection, authentic learning and collaborative learning. Learning is collaborative in nature; group settings can further foster learning (Schrire, 2004). Asynchronous online environments can provide students with opportunities such as self-reflection, elaboration, and in-depth analysis of course content, allowing for purposeful construction of knowledge (Pena-Schaff & Nicholls, 2004). Rourke and Anderson (2002) assert the importance of online discussion as an essential activity for co-constructing knowledge since "explaining, elaborating, and defending one's

position to others forces learners to integrate and elaborate knowledge in ways that facilitate higher-order learning" (p. 3).

The level of interaction helps result in learning. Dennen and Wieland (2007) indicate, "Learners must interact in some particular ways, engaging with each other and course material at deep (as opposed to surface) levels, which lead toward negotiation and internalization of knowledge rather than just rote memorization of knowledge" (p. 283). According to Andresen (2009), it is important for instructors to make asynchronous discussions successful. In order for this to occur, two important components must be carefully considered: the role of the instructor and how to achieve deeper/higher learning. The work of De Wever, Van Keer, Schellens, and Valcke (2009) indicates that a significant positive impact of assigning roles to students can be achieved, particularly if the role assignments occur early in the instructional period. Facilitation becomes a shared responsibility among instructors and students. According to Baran and Correia (2009), the majority of research focuses on instructor facilitation strategies and only a limited number of researchers have examined the use of facilitation strategies in peer-facilitation contexts.

The online environment presents itself as a critical tool for constructing, representing and mediating discussions between students. Facilitating learners to elaborate their knowledge in peer discussions and acquire multiple perspectives on a topic can be achieved through the assigning of roles. Roles assigned to students have the potential to increase knowledge construction through social negotiation outside the confines of the brick and mortar classroom. Simply placing students in groups does not automatically bring about collaborative learning or effective interaction. A purposeful instructional design, building on collaborative learning environments must focus on embedding certain amounts of structure, such as setting clear goals and defining the tasks (DeWever et al., 2009). In the case of this study, the purposeful instructional design included specific facilitation requirements for each of three discussions under investigation.

The purpose of this study was to determine the impact of various facilitation strategies on constructing knowledge and increasing collaboration in the asynchronous online discussion environment. An analysis of the interactions within online discussions designed as part of a hybrid delivery of instruction was completed in order to characterize successful student-led facilitation strategies in asynchronous discussions.

A. Framework.

The guiding framework for this work is learning as social construction of meaning. According to social constructivist theory, when students are presented with learning environments that encourage active participation, interaction and dialogue, they become opportunities to create meaning from new experiences (Jonassen, Davison, Collins, Campbell, & Bannan Haag, 1995). A constructivist theory suggests that learning is more effective when students are given opportunity to discuss ideas, experiences and perceptions with their peers.

> Based on the constructivist framework of learning, educational environments should provide activities and opportunities for students to articulate and reflect on the content under study, to negotiate meaning with the self (reflective activity) and with others, and to apply the knowledge learned in real life situations. In this manner, learning becomes an active process in which individuals create meaning by analyzing, discussing and

> experiencing new situations and applying new concepts. (Pena-Shaff & Nicholls, 2004, p. 245)

Rourke and Anderson (2002) conclude that from a social constructivist perspective, online discussions create opportunities for students to construct meanings together and integrate new knowledge into their prior experiences. The asynchronous online discussion environment provides the context and tools for students to engage in meaningful learning experiences. "Theoretical models of collaborative learning consider the discourse in a computer conference as both reflecting and shaping the cognitive processes" (Schrire, 2006, pp. 52-53). Schrire (2006) goes on to note that the cognitive processes are of a social nature in that they arise out of, and contribute to, the interactions among the participants.

B. Choosing a methodological approach.

Early research on online learning focused on the quantifiable variables; however, the early 1990's brought an increased emphasis on the aspects of quality of learning and learning interaction (Henri, 1992; Hillman, 1999; Pena-Shaff, Martin, & Gay, 2001). Creating a study that moved beyond the quantifiable variables was important to this researcher in developing strategies appropriate and effective in the online environment. Qualitative research, from a philosophical perspective, is based on a view that there are "multiple realities" (Schrire, 2006, p. 52). Mason (1992) recommends the use of content analysis in studies on computer conferencing. Additionally, Merriam (2001) asserts that the performance of a content analysis within the case study framework allows a study to move from mere description to meaningful interpretation. Content analysis is not only compatible with the case study approach (Schrire, 2006) it also provides the basis for interpretation in context (Cronbach, 1975). This study, different from a yes or no question-and-answer approach frequently associated with quantitative research, develops around what Merriam (2001) describes as a focus on *what* happens in a given context, *how* the events take place and *why* they occur. A case study approach incorporating both qualitative (participation levels, percentages of indicators covered) and qualitative (content analysis of discussion posts) design proved the most effective approach for this study. The application of three different treatments in the form of facilitation approaches provided an opportunity for comparison between discussions. Finally, using the Knowledge Construction Category System previously developed by Pena-Schaff and Nicholls (2004) allowed for a comparison to their study regarding the creation of knowledge in the online setting.

II. Methodology.

A. Context.

This study took place in the context of a graduate level course at a comprehensive university in the Midwestern USA. The Master of Science degree program, housed in the university's College of Education and Human Services, includes a 3-credit required course focused on the theoretical background of educational systems in the United States. The degree program was designed for any students seeking increased formal and informal leadership skills in pre-kindergarten to 12th grade (Pk-12) settings, higher education institutions, non-profit organizations, or any other systems focused on education and leadership. The hybrid nature of the course incorporates both face-to-face and online components, with students meeting on campus every other week and in

the online environment during the opposite weeks. Also known as a blended course, this approach combines face-to-face instruction with computer mediated instruction as an alternative to the traditional delivery model. Such blending has been found to contribute to both achievement and student satisfaction (Roblyer & Wiencke, 2004) and has become an increasingly popular delivery model in higher education (An & Frick, 2006; Ng & Cheung, 2007). This study focused on the analysis of knowledge construction in online class discussions.

B. Participants.

The course under study during the Spring 2012 semester included 17 women and 7 men (n=24). All 24 successfully completed the course. The researcher served as the instructor of the course. All 24 students were Pk-12 teachers, counselors or library media specialists seeking a Master of Science degree. Eleven of the participants were also seeking Pk-12 administrative licensure.

C. Discussion Assignments.

Throughout the semester, there were six online discussion sessions. The first discussion assignment focused on introductory statements from participants. This was meant to provide some instruction on using the Desire2Learn (D2L) discussion features and comfort in navigating this particular platform. D2L is the university-adopted platform serving multiple functions, one of which is its online learning environment. The final two discussions focused on group project progress. The study, therefore, focused on the discussion assignments in weeks 4, 6 and 8 of the 14-week semester. Each of these discussion assignments was different in regard to the type of facilitation required. The week 4 discussion treatment was a loosely structured (non-facilitated) approach. The week 6 discussion required each student to facilitate a specific topic within the broader discussion. The week 8 discussion treatment was a single volunteer serving as facilitator for the overall discussion. Each discussion assignment was open for a 10-day window.

During face-to-face instruction time, information was provided to students regarding quality posts. Handouts to further clarify were also provided (See Appendix A). Students were placed in groups of four for each discussion. Group membership changed with each discussion. The instructor monitored the online discussions, providing comments and feedback during face-to-face classroom time but not directly participating in the online group discussions. The purpose of the study was to analyze the quality of interaction and learning taking place during asynchronous discussions by focusing on the types of instructional strategies employed to foster knowledge building in a collaborative online environment. Using three different discussion techniques allowed for comparison of the three in terms of levels of participation and depth of knowledge construction.

D. Data collection and analysis.

Both quantitative and qualitative approaches were employed to describe and analyze levels of participation, interaction, and meaning construction. The quantitative data included the total number of messages posted for each treatment, the percentage of overall messages posted per treatment, and the percentage of knowledge construction posts per the work of Pena-Shaff and Nicholls (2004). The administrative functions of D2L were used to note frequency of participation and threads of interactions; however, since paragraphs were the unit of measure for

this study, that data was of far less importance than the content of the messages. The qualitative data of this study consisted of the content analysis of the three discussion assignments. Content analysis was conducted on the transcripts of the discussions each week under study. Rourke and Anderson (2004) suggest that instead of developing new coding schemes, researchers should use schemes that have been developed and used in previous research, fostering replicability and the validity of the instrument (Stacey & Gerbic, 2003; Hannafin & Kim, 2003). This study, therefore, utilized the coding schema developed by Pena-Shaff, Martin, and Gay (2001) and further modified by Pena-Shaff & Nicholls (2004). Using the existing category system, or set of indicators, allowed for coding and categorizing of discussions and the opportunity for comparing results to the patterns identified in the work of Pena-Shaff and Nicholls (2004). As the previous study already revealed the types of posts that could be identified as knowledge building, the current study used those findings to better identify the strategies that could be identified as knowledge building. The codes and descriptions of this model can be viewed in Table 1.

The discussion transcripts from the three selected discussion assignments were coded by the instructor/researcher. An initial coding was completed for each week under study. As a follow-up at the end of the data-collecting weeks, a second coding of the messages was conducted to check for ambiguity in the coding. Paragraphs were chosen as the unit of analysis. Each discussion contribution reflects a level of social construction knowledge. These levels were determined by applying the Pena-Shaff and Nicholls' Knowledge Construction Category System and Indicators. Each message (paragraph) received one code. When a message was comprised of multiple levels of knowledge construction, the most prominent was assigned. For example, when a student provided clarification of a previous statement but went on to provide interpretation of the discussion topic, the more prominent or more elaborated upon indicator was assigned.

Table 1. Knowledge Construction Category System and Indicators[2]

Category and Description	Indicators
Question: Gathering unknown information, inquiring, starting a discussion or reflecting on the problems raised.	+ Information seeking questions + Discussion questions + Reflective questions
Reply: Responding to other participants' questions or statements.	+ Direct responses to information-seeking questions + Elaborated responses that include information sharing, clarification and elaboration, and interpretation
Clarification: Identifying and elaborating on ideas and thoughts.	+ Stating or identifying ideas, assumptions and facts + Linking facts, ideas and notions + Identifying or reformulating problems + Explaining ideas presented by -using examples -describing personal experiences -decomposing ideas -identifying or formulating criteria for judging possible answers or to justify own statements (Making lists of reasons for or against a position) -arguing own statements -defining terms -establishing comparisons

[2] Pena-Shaff, J. & Nicholls, C. (2003). Analyzing student interactions and meaning construction in computer bulletin board discussions. *Computers & Education, 12*, 243-256.

	-presentation of similarities and differences -listing advantages or disadvantages -using analogies -identifying causes and consequences
Interpretation: Using inductive and deductive analysis based on facts and premises posed, making predictions and building hypotheses. Includes reflection and analysis when originating from the clarification point.	+ Reaching conclusions + Making generalizations + Predicting +Building hypothesis + Summarizing + Proposing solutions
Conflict: Debating other participants' point of view, showing disagreements and information in previous messages, and taken to an extreme, friction among participants.	+ Presenting alternative/opposite positions (debating) + Disagreements + Friction
Assertion: Maintaining and defending ideas questioned by other participants by providing explanations and arguments that defend original statements.	+Re-statement of assumptions and ideas + Defending own arguments by further elaboration on the ideas previously stated
Consensus Building: Trying to attain a common understanding of the issues in debate.	+ Clarifying misunderstandings + Negotiating + Reaching consensus or agreement
Judgment: Making decisions, appreciations, evaluations and criticisms of ideas, facts and solutions discussed as well as evaluating text orientation and authors' positions.	+Judging the relevance of solutions + Making value-judgments + Topic evaluation + Evaluating text orientation and authors' position about the subject being discussed
Reflection: Acknowledging learning something new, judging importance of discussions topic in relation to their learning.	+ Self-appraisal of learning + Acknowledging learning something new + Acknowledging importance of subject being discussed in their learning
Support: Establishing rapport, sharing feelings, agreeing with other people's ideas either directly or indirectly, and providing feedback to other participants' comments.	+ Acknowledging other participants' contributions and ideas + Empathy: sharing of feelings with other participants' comments ("I felt the same way…") + Feedback
Other: Includes mixed messages difficult to categorize and social statements.	+ Messages not identified as belonging to a specific category + Social comments not related to the discussions: greetings, jokes, etc. + Emotional responses

Table 2. Total numbers and percentages by treatment.

Treatment	Total number of Paragraphs Posted	Percentage of Paragraphs Posted	Percentage of PKCC Paragraphs Posted
#1	212	31.5	64
#2	340	50	69.1
#3	124	18	87
Total Paragraphs	676		

As was the case in the Pena-Shaff and Nicholls (2004) study, content analysis was used to identify the most common patterns of discourse. The category system previously developed and applied in that study was applied to the current study. According to Pena-Shaff & Nicholls (2004), "Statements of *clarification, interpretation, conflict, assertion, judgment* and *reflection* appear to be most directly related to the process of knowledge construction" (p. 252). For discussion purposes, this researcher has labeled these six indicators as primary knowledge construction categories (PKCC). Treatment one, or a loosely structured (non-facilitated) approach, included a total of 212 paragraphs posted (see Figure 1). Of these 31.5% of the overall 676 posted during the study weeks, 64% were coded as PKCC posts.

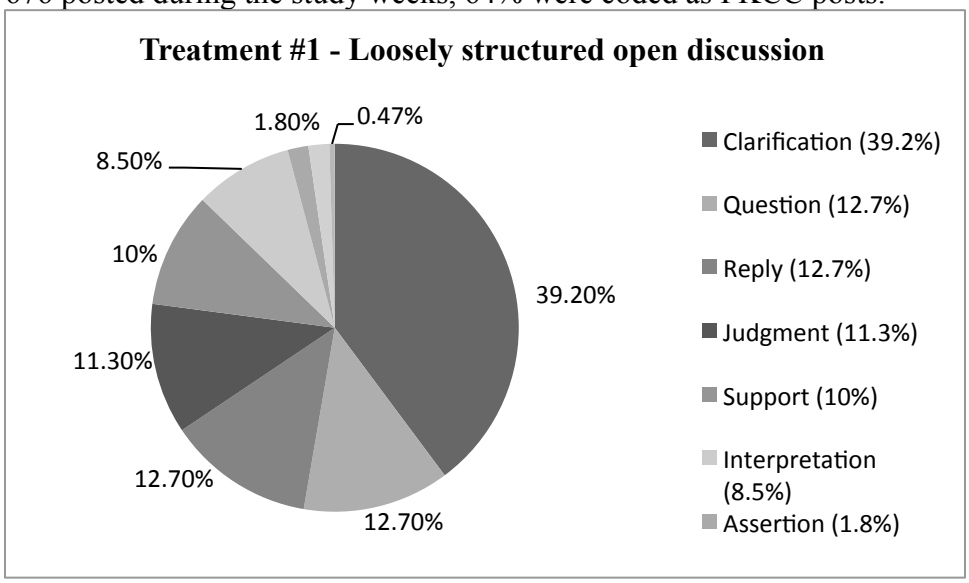

Figure 1. Percentage of Knowledge Construction in a loosely structured open discussion.

Treatment two, where each student was required to take responsibility for facilitating a specific topic within the overall discussion, consisted of 340 posted, or 50% of the total posts under study. This treatment generated 69.1% of PKCC posts (see Figure 2).

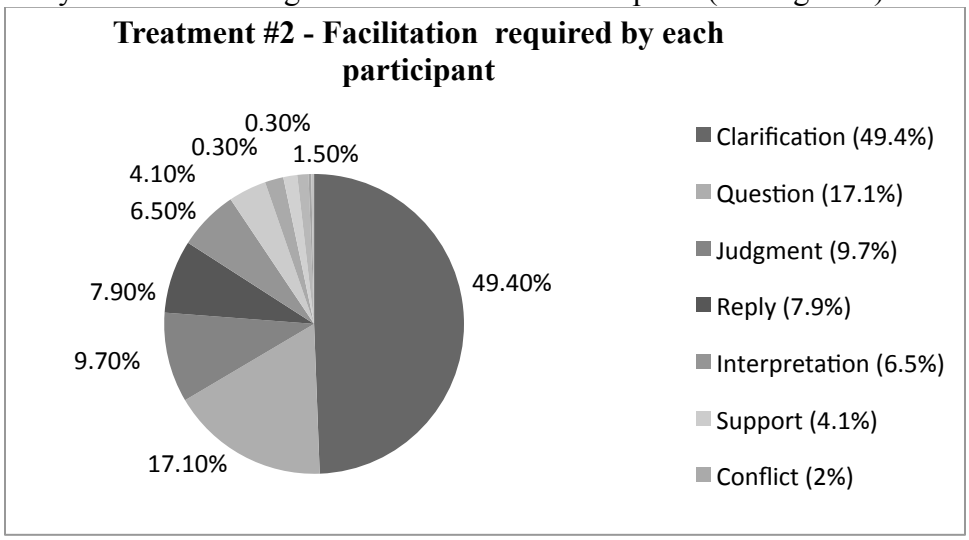

Figure 2. Percentage of Knowledge Construction with required facilitation.

The final treatment, where an individual in each discussion group volunteered to serve as facilitator for the length of the discussion, generated a total of 124 paragraph posts. This small number, only 18% of the total study posts, also generated the highest level of PKCC posts with 87% falling into the categories identified by Pena-Shaff and Nicholls (2004) as knowledge construction categories (see Figure 3).

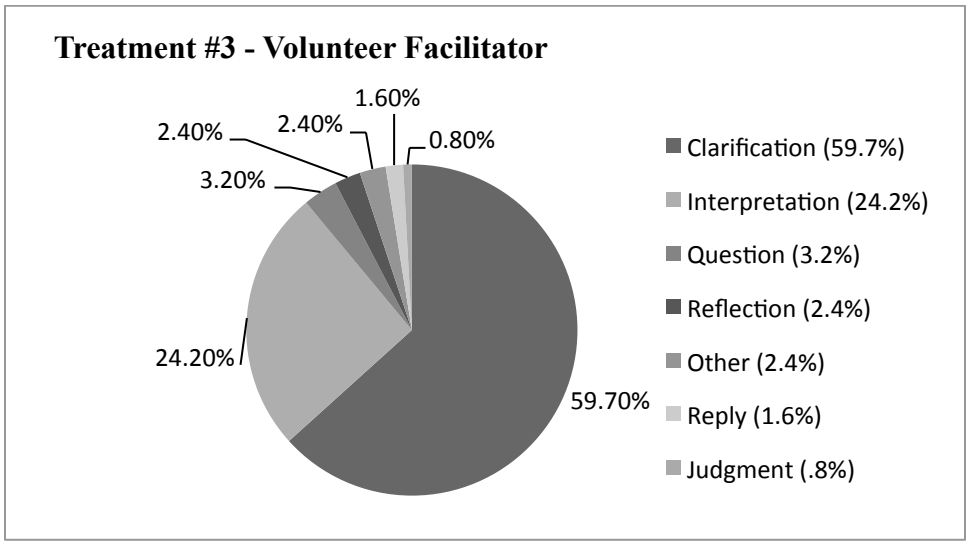

Figure 3. Percentage of Knowledge Construction with a Volunteer Facilitator.

IV. Discussion.

This small-scale case study provided a great deal of information regarding the role of facilitation in a graduate-level hybrid delivery course. According to Andresen (2009), "The primary difficulty in making any assessment of an asynchronous discussion forum is the huge volume of data that are available to be assessed…" (p. 252). Despite the small number of participants in this study, there was a "huge volume" of data, with a total of 676 paragraphs to be coded. Had the volume been low, this researcher would have felt uncomfortable making generalizations in regard to the facilitation types as knowledge construction contributors.

Hew, Cheung, and Ng (2009) conducted a study to determine what motivates students to contribute to student-facilitated discussions. Their findings indicated that 66% of the study participants agreed or strongly agreed that familiarity with the discussion facilitator motivated them to contribute more frequently to message postings. The findings by Hew, Cheung, and Ng clearly address the impact of the hybrid nature of a course versus a fully online version. The face-to-face sessions provide opportunity for community building that carries over into the electronic environment. Activities conducted in face-to-face settings to build community likely contributed to the strong online presence found in this study. The significant volume of data may be directly attributable to the learning community previously built.

Another study relevant to the findings of the current study was conducted by Baran and Correia (2009) where, similar to the current study, the researchers used three separate facilitation treatments, conducting each as a separate mini-case. Each case represented a different facilitation experience in their search to discover whether peer facilitation strategies could be used to overcome the challenge of instructor-led facilitation, enhance the sense of a learning community and encourage students' participation. What they found in their study was that regardless of the

type of peer-discussion facilitation, whether highly structured, inspirationally facilitated, or practice-oriented, peer facilitation can help generate innovative ideas, motivate students to participate actively and provide an atmosphere for involvement and commitment. Also relevant was that it did not matter if the group sizes or memberships changed; all three treatments promoted meaningful dialogue, produced high levels of participation, and included quality conversation. The current study found the same to be true.

As noted earlier, previously developed indicators served the critical role of providing categories of knowledge construction. Content analysis was used to identify the most common patterns of discourse, just as was done in the Pena-Shaff and Nicholls (2004) study, and the category system indicators were applied to the data. In their work, Pena-Shaff and Nicholls determined six categories as indicators of knowledge construction. In the current study, those six categories were evaluated in each of the three treatments to determine levels of knowledge construction. A volunteer facilitator during a group discussion generated the highest level of PKCC posts, providing insights into discussion strategies that support learning in the online environment. In addition to the six indicators labeled as PKCC (clarification, interpretation, conflict, assertion, judgment and reflection), Pena-Shaff and Nicholls identified secondary levels of indicators in relation to knowledge construction.

Questions, according to Pena-Shaff and Nicholls (2004), also indicate that students are trying to make sense of and understand topics being discussed. While quality reflective questions can certainly serve this purpose, this study found questions to be generally overused in terms of simple discussion generation. During treatment two, facilitation was apparently defined by students as generating questions in order to start and/or continue an online discussion. This is not necessarily counterproductive, except that several questions were raised without any follow-up to them by other discussion participants. In fact, 17 questions were raised during the second discussion period (treatment two) without any response.

Of the categories identified, clarification statements formed 48% of the total (676) paragraphs. This means that students spent a great deal of time explaining and elaborating upon their ideas. Pena-Shaff and Nicholls (2004) had similar results. They noted, "Although in many cases clarification statements began as messages either questioning or responding to previous messages, they tended to become reflective monologues in which students focused more on explaining their own ideas, perspective and beliefs than on addressing specific points in others' contributions" (p. 257). The following represents an example of this type of message:

> That's a good question! I think I would have a 'senior' teacher who has bought into a school-wide system give a little presentation to the teacher who has not yet bought in. Obviously, we want to make the teacher understand why we are implementing a system and to be able to see the benefits. I think having another co-worker explain the situation may make the teacher more receptive. Also, I think the Administrator should make unscheduled 'visits' to all classrooms. This is not to look for any problems or issues, but rather to keep current with curriculum and classroom tendencies in all grade levels.

Interpretation statements, including inferences, conclusions, discussion summaries, generalizations, hypothesis building, and suggesting solutions to problems stated represented, overall, just 10% of the statements; however, this category also showed the greatest amount of change between the first two discussion treatments and the third: Treatment one: 8.5%; treatment two: 6.5%; treatment three: 24.2%. This indicates that in the first two treatments, students did not

provide a summary of ideas presented in a discussion thread. In the third discussion, with a single facilitator, this increased significantly.

Conflict was almost non-existent in the discussions. Despite this researcher spending time in class assuring students that a healthy discussion can include disagreements with one another, and facilitating such disagreements in the face-to-face setting, students were loath to disagree in the online format with a mere 1.4% labeled as such. Conflict has the potential to enhance discussion through a quality debate. This, however, was absent from the three discussions analyzed. Equally low in number (1.1%) were statements of assertion. This seems to indicate that very few students replied to messages that challenged ideas they had presented in previous messages.

It appears from this analysis that the treatment applied to each discussion influenced participation levels as well as knowledge construction. Based on the categories established by Pena-Shaff and Nicholls (2004), when discussion was left as an open forum without facilitation, less knowledge construction occurred. Participation levels were, of course, much higher when all students were required to facilitate some portion of the discussion (treatment two); however, the PKCC stayed very close in percentage to when no facilitation occurred (treatment one). The greatest level of PKCC occurred when a student served as a facilitator of the discussion, as was done in treatment three. The participation level declined for this treatment (only 18% of all paragraphs posted throughout the entire study period), but the overall quality of the discussion in terms of knowledge construction was far greater with 87% of the paragraphs posted falling into the PKCC categories. Gilbert and Dabbagh (2005) offer one possible explanation for this significant difference between the treatments. In a study examining the impact of highly structured versus less structured discussions, Gilbert and Dabbagh found that participation levels were higher when specific facilitator guidelines were provided. This was certainly the case in the current study as guidelines were carefully spelled out for treatments one and two, those with the highest participation levels, but far less structured in the third treatment where participation dropped. A sample of discussion postings and their codes can be found in Appendix B.

Some limitations of the study must also be noted. Benefits certainly exist in using a previously-developed coding scheme. Clearly, this allows for comparison and replication. Pena-Schaff and Nicholls (2004) provide a variety of samples and examples to further clarify and define indicators; however, limitations exist. There is still the limitation of one researcher closely using the work of another without being able to fully guarantee reliability as it is impossible for the exact interpretation of terms, indicators and samples. Also, the student sample is very small so it is difficult to make broad generalizations based on the results. Finally, the researcher knows the students quite well, even serving as their program advisor as they complete their graduate degree. This potentially increases the possibility of bias as it is difficult to completely extricate the role of researcher from the role of course instructor.

V. Conclusions.

This small-scale case study appears to support what other researchers have reported. Online discussion forums have great potential to encourage critical thinking and the process of knowledge construction. The use of specific strategies to better encourage that potential is critical. Finding ways to build community in the classroom setting that can be carried to the online setting is important. Additionally, appropriate tasks, clear guidelines and defined facilitator expectations also increase the likelihood of success. According to Andresen (2009),

"Knowledge construction only occurs because of careful planning: clear, well-defined, well-crafted questions and discussion topics. Without such planning and subsequent guidance, only lower levels of cognitive engagement will occur" (p. 252). The assignment of facilitation roles in this study showed an increase in the types of interactions believed to lead to increased knowledge construction. More specifically in this study, having one participant volunteer in the role of facilitator led to the greatest increase in knowledge construction. Keeping groups small appears to optimize participation also, with group sizes of four being utilized in the current study. "Interaction among course participants helps them apply and integrate newly gained knowledge in the course of engaging in group activity" (Wang, 2010, p. 832).

Unlike the findings in many online discussion studies, low participation was not a factor. Students participated far beyond the minimum requirements and expectations. Using activities in the classroom to encourage collaboration seemed to carry over into the online environment. Had students not been given such opportunity to become a learning community face-to-face, it is likely they would not have been so willing to participate at the same level in the online setting. As Pena-Shaff and Nicholls (2004) found, courses that include online discussion as a supplement to regular class meetings need to carefully integrate this activity into the overall course design "so students see it as integral to the class and not as a disassociated activity" (p. 263). An appropriate follow-up study might include the specific activities that are most effective in creating this environment.

Similar to other studies, students clearly did not go back to follow conversation threads as frequently as this researcher would desire. It is quite evident by the low number of conflict, consensus building and assertion statements that students usually did not return to a discussion thread after posting a question, clarification or interpretation. This researcher believes more work needs to follow on methods of motivating or challenging students to a greater extent so that discussions are not so much reflective monologues as they are dialogical interactions. Courses that meet in a face-to-face structure with an online component allow for in-class work on clarifying these expectations.

Social constructivist ideas about the most productive characteristics of learning environments can be supported through an online discussion opportunity where students reflect on others' ideas as well as their own. This is particularly true when students are required to share ideas in writing. According to the results of this study, the most effective instructional strategy of the three employed for a constructivist, collaborative approach is using a student volunteer as discussion facilitator. Future research might focus on other strategies not included in this study which might prove even more effective.

Appendixes.

Appendix A.

Guidelines and Rubric for Online Discussion Requirements
Educational Leadership Courses

In this class, online discussions will be graded assignments. The purpose of the online portion of the course is to frame and promote collaborative learning. Active and regular participation is not only an important part of your responsibilities to the class but also important for you in learning new course content and in developing your thoughts and positions on various topics.

There are three very important rules for using online discussion boards:

1. Please remember that the culture of mutual respect that is part of our face to face time extends into the virtual classroom environment.
2. Participation is required.
3. Participation alone is not enough. Your posts require a thoughtful and meaningful approach. Quality does count!

The total of your participation in a single discussion topic (noted as a weekly assignment) will be graded on a 10-point scale.

Please follow this protocol for posting and responding to online discussions:

a. You are expected to participate on multiple days. As this is an asynchronous discussion format, not everyone will be ready to post on the same day. Check your discussion board on at least three different days to get the full effect of your group's discussion.
b. You should follow the specific posting requirements noted for each week. Make sure you meet the minimum requirements for the week.
c. There is a rather fine line between a post that is too short and one that is too long. Whether you agree or disagree with someone else's post, explain why with supporting evidence and concepts from the readings or a related experience. Include a reference, link, or citation when appropriate.
d. Be organized in your thoughts and ideas.
e. Incorporate correlations with the assigned readings or topics.
f. Stay on topic.
g. Provide evidence of critical, graduate-level thinking and thoughtfulness in your responses or interactions. Avoid summarizing.
h. Contribute to the learning community by being creative in your approaches to topics,, being relevant in the presented viewpoints, and attempting to motivate the discussion.
i. Be aware of grammar and sentence mechanics.
j. Use proper etiquette. Being respectful is critical.

A Discussion (9-10 points)

A-level postings:

- Are made in a timely fashion, giving others an opportunity to respond.
- Are thoughtful and analyze the content or question asked.
- Make connections to the course content and/or other experiences.
- Extend discussions already taking place or pose new possibilities or opinions not previously voiced.
- Are from participants aware of the needs of the community, motivate group discussion, and present a creative approach to the topic.
- Follow the conventions of quality writing.
- Meet the minimum posting requirement.

B Discussion (8-9 points)

B-level postings:

- Are made in a timely fashion, giving others an opportunity to respond.
- Are thoughtful and analyze the content or question asked.

- Make connections to the course content and/or other experiences, but connections are unclear, not firmly established or are not obvious.
- Contain novel ideas, connections, and/or real-world application but lack depth, detail and/or explanation.
- Are from participants who interact freely and occasionally attempt to motivate discussion.
- Have few errors in writing conventions
- Meet the minimum posting requirement

C Discussion (7 points)

C-level postings:

- Are usually, but not always, made in a timely fashion.
- Are generally accurate, but the information delivered is limited.
- Make vague or incomplete connections between class content and posting by other students.
- Summarize what other students have posted and contain few novel ideas.
- Show marginal effort to become involved with group.
- Have numerous errors in writing conventions
- Do not meet the minimum posting requirement.

D Discussion (6 points)

D level postings:

- Are not made in timely fashion, if at all.
- Are superficial, lacking in analysis or critique.
- Contribute few novel ideas, connections, or applications.
- May veer off topic.
- Show little effort to participate in learning community as it develops.
- Does not understand the standard conventions of written English.

F Discussion (0 points).

- Participant was rude or abusive to other course participants. In this case, the number and quality of other posts is irrelevant.

OR

- Participant failed to meet the basic criteria for the "D Discussion."

Appendix B.

Coded Excerpts from Discussions

Initial Post – Structure Discussion

After doing a little reading I related really well to one part and wonder if you did as well. In the section about structural dilemmas the very last sub-category of "Irresponsible vs. Unresponsive" created a vision for me of the "go-to" parent or teacher. What I mean is, are you going to tell Mom or Dad first you failed a test, which one will be cooler with it and which one will blow up at you take away your phone and ground you? I feel this can happen in a school setting easily if one teacher is laid back on homework and allow students a few days to get stuff in verse a teacher who allows no days. Or a bigger one that I think we see more often is with discipline and behavior issues. What do some teachers allow and others do not. For example a teacher who writes a student up for every little thing is losing the "power" of the referral where as a teacher who uses the referral as a last chance still hangs onto that power and uses it when necessary? What are your thoughts and have you had similar situations? **[Question]**

Replies to Initial Post

This is a very good point that you brought up, and I think it to relates back to that lateral coordination. Not only do we need to have more cross-grade level meetings but I think we also need to have meetings on things such as these. I know that every teacher is going to have a different view on what students can get away with, as well as what administration is going to take as a serious offense, or taken more lightly. I think that the PBIS at the middle school is run very well, and I know that we are just really getting into the "good years" of it. I think that we can start opening up some discussions on issues such as these so that administration and teachers, are all on the same page as to what should be a referral and what should be let go. How many chances does each student get? These are good conversations to start having in teams. **[Reply]**

I could not agree more with the feeling of isolation. Throughout the course of the day, I sometimes do not see teachers from my grade level. Information has to pass through all people involved. M__ your point about structure and lack of opportunity here at the middle school is exactly how I feel. Cross-grade level meetings would be beneficial if used properly. If nothing more, you interact with peers and build personal relationships. Like you stated Stephanie, it's important to find the common ground between the two. **[Clarification]**

When I look at the structural assumptions, number four really jumps out at me. I think that it is important to be rational about things that go on in an organization, and I feel that many administrators are quick to forget about rationality, and want to get their agenda met and accomplished. Adding pressure and forgetting about rationality only stresses individuals out, and doesn't accomplish much. Going off of this, I will talk about how I feel my building is run. I feel that in the building that I am in there is a later coordination. There are many different groups that are working on different things, and then we come together as a staff to report on them. We have school-wide improvement committee, literacy committee, etc. These groups meet on their own and have their own agendas, and report back to the staff as a whole to keep everyone informed and up-to-date. My question on this is whether or not administration (not just in my school, but anywhere with a similar approach) actually looks at it as a lateral approach or if they have it in the back of their minds that ultimately they are making the last decision? And, how as an administrator do you come to certain conclusions without taking it to a vertical approach if groups aren't getting the outcomes that you would like them to? **[Clarification]**

When I think about the structural dilemmas, the first one that really got my attention was the *Excessive Autonomy Versus Excessive Interdependence.* When I look at the building I am in, I feel very much isolated from other teachers. I feel that having cross- grade level meetings would help this feeling a lot. The big question that I come too is when are you being too isolated? And when are you coming together too much? As an administrator I think it is important to find the common ground between the two and is something that should have thought put into it in an organization. **[Clarification]**

Glad you feel valued. That's a big key to keeping younger staff like you here. I think the administration is making a much better effort to give positive feedback and thanks to staff. However, I feel like it's usually when staff brings some kind of positive PR to the district that the

administration seems to notice. I think so much of the day to day things some of us do that go above and beyond go unnoticed. Curious what others thoughts are on that... **[Reflection]**

Initial Post – Human Resource Discussion

In my short career thus far as a teacher/coach at MHS, I have little evidence to argue that people are not the greatest asset in my workplace. Opinions about this might be different amongst other staff members, but for me personally, I have been made to feel that I am an important asset in our building. **[Clarification]**

Replies to Initial Post

Our Physical Education Department at the middle school consists of me and two other professionals. In the last year and a half, the three of us have overhauled our entire curriculum hoping to create a quality program for our students. Many of the changes to our program would not have been possible without the support and trust of our administrators. Additionally, our Physical Education Department recently had an article published in *Teaching Today,* the statewide educational newsletter for Wisconsin. In the article we discussed methods we use to incorporate literacy into our Physical Education classes. Shortly after the article was published, we received an email from our administrators thanking us for our hard work and commitment to our student's education. By sending a simple email saying thanks, our administrators provided confirmation that what we do is meaningful and we truly are assets in our workplace. *"When individuals find satisfaction and meaning in work, the organization profits from effective use of their talent and energy. But when satisfaction and meaning are lacking, individuals withdraw, resist, or rebel"* (Bolman & Deal, 2008, p. 164). **[Clarification]**

I definitely agree with your opinion that promotion within education is less practical in comparison to being promoted in a business environment. In education we know that there are great teachers, some with wonderful leadership qualities, which never pursue administration. I believe many because of the time and money needed for an additional degree/certification. In result, promotion within education isn't always the result of quality performance, but instead, the result of who is able to afford it vs. who is not. **[Clarification]**

Initial Post - Organizations as Cultures

I feel as though M___ High School *tries* to produce a positive school culture. We have annual traditions such as Homecoming (spirit week), Winterfest, Spring Fling, and graduation. Students and staff also receive purple t-shirts at the beginning in the first week of school and wear them with pride throughout the year. However, I often feel as though it's the **SAME** teachers who make an effort to participate in all of these activities. I can't recall the number of times I've heard a veteran teacher say something along the lines of "*it's the new teacher's turn to do this..."* I try to attend various athletic and extra-curricular events or judge for Student Senate competitions. At the Winterfest assembly this year I judged with ONE other teacher because no one else could/would help. During this year's corporate challenge we forfeited an entire evening of events due to lack of participation. It's frustrating to feel as though the same people take on the majority of all the tasks. **[Clarification]**

Replies to Initial Post

The truth is, we ALL have obligations. I know that while I may be considered a "younger" teacher, I have two children, a husband who works long hours and often travels, work a second job, advise three clubs, plan a trip to France every other year, took several graduate courses this year and am pursuing an additional master's degree, all in addition to my four (next year five) preps while most teachers have two or three. Yet I still manage to find time to make it to a few athletic events, extra-curricular activities, or academic nights (awards, graduation, etc.). So I wouldn't say I have more time, but maybe more energy. Hopefully that lasts! **[Clarification]**

I respect that many teachers, new and veteran, have obligations, commitments, or other priorities. However, younger teachers look to veteran teachers to lead by example. That's typically why they are chosen as mentors. The bottom line is there's always a reason *not* to do something. As a group of individuals pursuing a degree in *administration* is it not our goal to lead by example? Would we not look to our future employees to do the same? Is an administrator given a choice not to attend extra-curriculars because of a variety of other obligations? Food for thought. **[Question]**

[Full transcript sets are available from author upon request]

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