COOPERATIVE LEARNING IN DISTANCE LEARNING: A MIXED METHODS STUDY

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Distance learning has facilitated innovative means to include Cooperative Learning (CL) in virtual settings. This study, conducted at a Hispanic-Serving Institution, compared the effectiveness of online CL strategies in discussion forums with traditional online forums. Quantitative and qualitative data were collected from 56 graduate student participants. Quantitative results revealed no significant difference on student success between CL and Traditional formats. The qualitative data revealed that students in the cooperative learning groups found more learning benefits than the Traditional group. The study will benefit instructors and students in distance learning to improve teaching and learning practices in a virtual classroom.

Key Words: cooperative learning, distance learning, cooperative learning, online learning, virtual classroom, learning practices

INTRODUCTION

Researchers and education specialists endorse the view that student learning can be maximized, thus academic performance improved, by developing a sense of "we are all in the same boat together," a basic tenet of cooperative learning (CL). The effectiveness of CL principles and techniques in building a motivating, supportive learning environment is well known (Johnson and Johnson, 1989). As the benefits of collaboration in education are clear, the use of technology to facilitate CL is vital.

The CL model (Johnson and Johnson, 1989) incorporates five essential elements: positive interdependence, individual accountability, face-to-face promotive interaction, social skills, and group processing. When these elements are structured carefully into the instructional format, improved student participation, motivation, and responsibility have been noted (Assinder, 1991). The student-centered approach of CL leads to learner autonomy. The positive impact of CL has far-reaching effects that extend beyond the classroom, into participants' professional and personal lives.

In recent years, distance learning has made possible several innovative means to include CL in virtual pedagogical settings. Researchers have reported that group work through computer-mediated collaboration resulted in improved performance, interaction, and critical thinking (Bliss and Lawrence, 2009). However, no known work has been done comparing faculty and student experiences in traditional online discussions and those structured with CL elements. Incorporating the elements of CL in distance learning is effective, for instance, through structured synchronous and asynchronous group discussions (Cox and Cox, 2008) to attain the goal of positive interdependence, individual accountability, and group processing, while interactive journals, chat, and blogs are efficient ways to promote interaction and social skills. Through courses that facilitate building productive online communities (Palloff and Pratt, 2005; Salmon, 2002), adult learners receive a meaningful and long lasting experience. With the rapid increase of and demand for online education, it becomes imperative for virtual instructors to incorporate feasible instructional strategies and formats proven to be successful in traditional educational settings. In fact, cooperative learning has been found to result in higher achievement among students when compared to individualistic and competitive learning, even when different methods are applied in diverse settings (Johnson and Johnson, 1989; Johnson et al., 2000).

Based on current trends in education which point toward increased use of distance learning and research on the benefits of cooperative learning at all levels, this study investigated the effectiveness of specific CL strategies in discussion boards, a commonly used distance learning tool which fosters student engagement online. The results of the study will benefit instructors as well as students participating in distance learning, as they reflect on and improve teaching and learning practices in a virtual classroom.

The tools used for communication and the timing of these tools are important factors to having successful collaboration in online courses (Havard et al., 2008). One of the tools that have been effective in supporting and enhancing cooperative learning in an online environment is the discussion board tool (Cox

and Cox, 2008). A benefit of discussion boards is the valuable learning accomplished in an asynchronous environment. Collaboration in an asynchronous environment offers flexibility, where synchronous communities are dependent on each other (Paulsen, 2008). Asynchronous formats in online learning promote reflective discussion responses (Prestera and Moller, 2001). The discussion board, an asynchronous communication tool, is conducive for social interaction where knowledge and understanding are discussed, thus providing an effective collaborative learning platform (Bliss and Lawrence, 2009). In evaluating online collaboration tools, Havard et al., (2008) discovered how students find the discussion board to be "flexible, convenient, and efficient" due to its asynchronous format (p. 44). There are multiple manners of using discussion boards with groups of students; they can be used for planning purposes, feedback, and social interaction (So, 2009). While discussion boards have been used for groups to plan their work prior to presenting it, they can also be used for instructor or peer-to-peer feedback critical for the learning process (Ku et al., 2004). Further, threaded discussions in the discussion board encourage student interactions and collaboration (Prestera and Moller, 2001). Additionally, the discussion board is a place where students can interact with their peers and professors for academic purposes and professional networking.

Schellens et al., (2007) found in their research on computer supported collaborative learning that when students participate actively in discussion groups, their grades are positively affected and their test scores are higher. Similarly, Bliss and Lawrence (2009) found small group discussions to have greater student participation, in comparison to whole group discussions, as well as more peer- to-peer interaction and a richer knowledge construct through discussion posts. Surprisingly, the instructors' presence or number of discussion threading was not a significant factor in the value of the groups' discussion.

While flexibility and convenience are positive elements to online learning, they can easily fade when confronted with useless, unproductive communication or tasks (Ku et al, 2004). To enhance online learning with collaborative techniques there must be relevant posts that initiate in-depth, course-related discussions (Bliss and Lawrence, 2009). To build a collaborative community, student interactions should not only be purposeful but structured in such a way where students have access to information and the support they need to succeed (Garrison, 2009).

Online collaborative communities not only engage students in the class, but they also connect students beyond the classroom (Harris, 2010). Individual learning offers flexibility, while cooperative learning promotes both flexibility and the support of a learning community (Paulsen, 2008). In a study to

determine the effectiveness of threaded discussions in creating collaborative learning, Cox and Cox (2008) found evidence that "interaction between students in an asynchronous learning environment leads to a community of learners" (p. 563). On the other hand, Ke and Carr-Chellman (2006) found that not all online learners find collaborative work necessary to critically examine class content; some online learners prefer learning alone. There may be fears that group work takes the expression of individuality from students (Smith, 2008). Some of the drawbacks in implementing collaborative learning in the online environment may include: off-topic posts, low student participation, negative feelings towards group work, delayed feedback which can result in low motivation or work pace, and low reading or writing skills (Bliss and Lawrence, 2009; Ciges 2001). The effectiveness of students' collaborative learning experience relies on the instructor, whose most important role is as facilitator (Prestera and Moller, 2001). Online faculty should be expected to build their online class environment and know it so well that they become guides to students through their own social and diverse learning experiences. Clear expectations and instructions from online instructors are vital for successful online learners (Hutchinson, 2007).

The perception that online learning may not provide as rich a learning experience as a student can obtain through a face- to-face traditional classroom format has been the shared opinion by many college faculty members and administrators (Alexander et al., 2009). However, Rabe-Hemp et al., (2009) contend in their comparison study of online learners and learners in a large lecture hall that online students reported an increase in preparation time, interaction with their professor, and in-class participation than face-to-face students.

Although there is much discussion on how to measure social presence in online environments, there is agreement that social presence is crucial in any type of online or computer mediated communication (Lin et al, 2004). Effective collaborative learning requires interpersonal interactions (Smith, 2008). However, Garrison (2009) argues that it not sufficient to simply have interaction, but that the interaction must be "structured and systematic if a collaborative process of critical inquiry is to be initiated and sustained" (p.98). The idea of collaborative learning used in the online environment is a fundamental and pedagogical challenge; the resulting question is: can both function together effectively to transform teaching and learning in online education (Garrison, 2009)?

METHOD

This study was driven by a mixed method approach and guided by the following research questions:

Is there a difference between student success in online learning discussion forums utilizing cooperative learning strategies and online learning discussion forums which utilize traditional discussion strategies?

Between cooperative learning and traditional discussion strategies in online discussion forums, which do students believe to be a more effective means of interaction among peers?

Student participants in the study were asked to complete a survey at the end of a 10-week session during which traditional and CL discussion board activities were conducted. The survey contained two open-ended questions that required qualitative analysis. These questions provided data related to the students' reflections about cooperative learning strategies and traditional leaning strategies in discussions in online coursework. The qualitative data were coded and themed according to emerging categories and patterns.

The study sample included 35 females and 21 males, with a total of 56 participants. Ages of participants ranged from 20 to 62+ years, with 25% of the sample in the 18-26 age range; 26.8% in the 27-36 range; 25% in the 37-46 range; 21.5% in the 47-56 range; and 1 person over 62 years of age. Of the total sample, 29 participants (51.8%) were Hispanic, 26 participants (46.4%) were Caucasian, and 1 participant was from the Middle East. Demographic data is shown in Table 1.

Table 1: Demographic data

Gender	
Male	21
Female	35
Race/Ethnicity	
% Caucasian	46.4
% Hispanic	51.8
% Middle East	1.8
Age	
18 – 26	25
27 - 36	26.8
37 - 46	25
47 – 56	21.5
>57	01.8

Data Source, Evidence, Objects or Materials

The researchers selected five faculty members teaching online graduate courses to participate in the study. These faculty members were provided information on the purpose of the study and research protocol. Based on studies by Hutchinson (2007) and Ku et al., (2004) on teaching practices for effective cooperative learning in an online learning environment, the researchers trained and guided the faculty in the implementation of cooperative learning strategies in discussion boards with suggested activities, together with information on the use of relevant technology. Faculty members were required to facilitate five discussion board activities utilizing cooperative learning strategies and five discussion board activities utilizing traditional discussion interaction. During this period, instructors were mentored by the researchers to offer advice, trouble-shoot, and provide technical support. At the end of the research period, students completed an online survey about their experiences in the discussions. The survey instrument included both quantitative and qualitative (open-ended) questions. An additional source of quantitative data was student grades for all ten discussion activities, provided by the instructors at the end of the study. Students were assigned an ID number by the instructor so that researchers could connect survey responses with course and discussion grades, while ensuring subject anonymity.

RESULTS

Quantitative:

No significant differences were found for the two main research questions utilizing the quantitative paradigm. On the question of whether there was a difference between student success in online learning discussion forums which utilize cooperative learning strategies and online learning discussion forums which utilize traditional discussion strategies, a one-way within-subjects ANOVA was conducted with the factors CL Avg and TRAD Avg scores. The means and standard deviations for the cooperative learning and the traditional groups are shown in Table 2.

Table 2: Descriptive statistics

Variable	Mean	Std. Deviation	N
CL	88.96	16.395	56
Traditional	91.71	14.062	56

Results indicated no significant differences, Wilks' Lambda: Wilks' A= 0.979, $F(3,27) = 1.196$, $p=.279$, $\eta^2= .021$.

On the question of whether there was a difference between cooperative learning and traditional discussion strategies in online discussion forums, a one-way within-subjects ANOVA was conducted with the factors CLTOTAL and TRTOTAL scores. The means and standard deviations for the cooperative learning and the traditional groups are shown in Table 3.

Table 3: Descriptive statistics

Variable	Mean	Std. Deviation	N
CL	74.8913	15.28576	46
Traditional	74.2826	14.23246	46

Results indicated no significant differences, Wilks' Lambda: Wilks' A= 0.995, $F(3,27) = .222$, $p=.640$, $\eta^2= .005$. The only quantitative difference found was between the TL and CL with a $p = .032$ on the sub-question, "I felt that my point of view was acknowledged by other course participants in Cooperative Learning/Traditional discussions."

Qualitative

However, utilizing the qualitative paradigm, several differences emerged upon coding and discovering the following themes: Brain-storming, Collaboration, Communication, Engagement, Equal opportunity, Feedback, Independent, Participation, Quality of Learning, Structure, Support, Time Management, Unreliable Members, Untimely, Untimely Feedback, Incomprehensible, Inefficiency, Negative Affect, Lack of Feedback, Repetitive, Less Interaction, Unstructured.

The lack of significant differences in the quantitative realm might have been due to the fact that the participants were all graduate students who are typically motivated to achieve high grades, regardless of the type of strategy being utilized. The qualitative data indicated that students in both the traditional learning group as well as the cooperative learning group found benefits in their respective learning strategies. Traditional learners were more interested in values that included support, independence, structure, and time management. Only 37.72% of their comments dealt with more educational values such as brain-storming, collaboration, communication, engagement, feedback, participation and quality of learning. On the other hand, the collaborators included time management at only 1.18% as a non-educational benefit. In this group, all other benefits were considered to be educational: 98.82% of the comments offered were concerned with brain-storming, collaboration, communication, engagement, feedback, participation and quality of learning.

In addition, based on the comments, there appeared to be different types of personalities in the classroom that needed to be accommodated. Among the students who preferred traditional learning activities, there were some who were independent minded (9.84%) and those who wanted structure (11.48%). The collaborators indicated that they were engaged (30.59%), valued communication (21.18%), and believed that quality of learning was an important byproduct (20%). However, based on the traditionalists' comments, only 21.31% indicated that they felt engaged, 8.2% valued communication, and 14.75% mentioned the quality of learning.

On the negative side, 41.94% of the comments had issues with unreliable members suggesting the need for faculty to attend to grouping structures. Students may need to control their group's composition to alleviate this problem. Many who expressed concerns about unreliable members still preferred and found benefits in collaborative learning. 25.80% of the negative comments involved lack of structure and 'untimeliness'. Those appear to be the traditionalists who need structure and time management.

Scientific/Scholarly Significance

Striving to understand and design coursework that maximizes opportunities for student success is vital to the continuing growth of online education and Asynchronous Learning Networks (ALNs). In addition to this, determining which factors may significantly impact student achievement is essential to allow this growing course venue to maintain the highest academic standards and achievement for students. From an institutional and instructional design perspective, promoting consistently higher levels of student engagement appears to have an impact on performance. While cooperative learning has been validated and researched across the globe, the connection between cooperative learning strategies has not fully been explored in the online medium. This study serves as an effort to fill that gap in research.

Limitations and Directions for Future Study

Data collection in this study was limited to a small research sample; further, the duration of the study was limited to one semester. As such, the results may not be generalized across all online graduate programs in minority institutions. This research is expected to serve as a launching pad for a more extensive study on the topic, with a wider scope in training instructors in cooperative learning in distance education, use of appropriate technology, and assessment of online student performance.

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