

A case study of cooperative learning and communication pedagogy: Does working in teams make a difference?

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Abstract: Cooperative learning has increasingly become a popular form of active pedagogy employed in academic institutions. This case study explores the relationship between cooperative learning and academic performance in higher education, specifically in the field of communication. Findings from a questionnaire administered to undergraduate students in a communication research course indicate that involvement in cooperative learning is a strong predictor of a student's academic performance. A significant positive relationship was found between the degree to which grades are important to a student and his or her active participation in cooperative learning. Further, the importance of grades and sense of achievement are strong predictors of performance on readiness assessment tests.

Keywords: cooperative learning, active learning, team-based learning, group achievement, communication pedagogy.

I. Introduction.

One of the greatest and inevitable challenges educators face is determining the most effective teaching strategies for their students. Understanding and assessing student involvement in learning can help teachers design the most effective curriculum and determine how students best learn. In addition, instructors must consider which skills will be most practical for students entering a workforce where building relationships and productivity go hand-in-hand. To meet the demand, many educators are using active learning pedagogies, such as cooperative or team-based learning. Active learning in the context of higher education is often a social and informal process where ideas are casually exchanged through student involvement and intellectual and interpersonal activities (Menges and Weimer, 1996). Bonwell and Eison (1991) conceptualize active learning as a process involving students not only “doing” things, but analyzing what they are doing.

Cooperative learning is one of the most commonly used forms of active pedagogy. Taking place through an individual's interaction with his or her environment and peers, cooperative learning is largely based on the idea that students learn through social contexts (Adams and Hamm, 1994). While cooperative learning has been found to be an effective pedagogical tool in a broad range of subjects, limited research explores this form of active pedagogy as it pertains to higher education, and specifically the communication field. This study contributes to ongoing research in active learning pedagogy through a case study examining the

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relationship between student involvement in cooperative learning and academic achievement in an undergraduate communication research methods course.

II. Background.

A. Benefits of Cooperative Learning.

Cooperative learning became a commonly used form of active pedagogy in the 1980's, and continues to be a valuable tool for learning in academic institutions today (Johnson, Johnson, and Smith, 2007), as it provides benefits for both students and instructors (Shimazoe and Aldrich, 2010). Slavin (1996) described cooperative learning as teaching methods in which students work together in small groups to help one another learn academic content. Johnson, Johnson, and Smith (1991) outlined several central elements comprising cooperative learning including positive interdependence, individual accountability, face-to-face promotive interaction, appropriate use of collaborative skills, and group processing, as will be discussed further. Studies on cooperative learning have indicated its positive relationship with student achievement and attitudes about learning (Slavin, 1989; Johnson and Johnson, 1989; Johnson et al., 2007). Cooperative learning has also been found to enhance social and intellectual development (Cohen, 1984; Burton, 1987) and help students build interpersonal skills while promoting a sense of achievement, productivity, and psychological well-being (Nilson, 1998). Further, researchers reported, "...students worked significantly harder for and learned more from the cooperative learning components than from the traditional lecture and text-based components" of courses studied (Carlsmith and Cooper, 2002, p. 132).

One possible explanation for cooperative learning's success is that effective learning often occurs through an individual's interaction with his or her environment, and language is the means by which learning and meaning are made conscious to the student. Interaction with others enables students to make sense of what they are learning as they become responsible for articulating and discussing class content with their peers (Adams and Hamm, 1994). Rushatz (1992) suggested that, "Cooperative learning strategies strive to create group situations that will foster support and feedback systems while developing decision making, problem solving, and moreover, general social interaction skills" (p. 5). Webb (1985) found that students exhibited signs of higher understanding when they were responsible for teaching concepts to their classmates and when their classmates taught concepts to them. Moreover, group members were more inclined to help other members learn concepts when the entire group's grade depended on each student's understanding of the subject. Team-based learning also provides opportunities for discussion and clarification of ideas (Gokhale, 1995). Interaction with peers offers students the chance to learn from one another's scholarship, skills, and experiences. Further, group discussions may force students to confront counter-arguments, encourage them to think beyond their own perspectives, and help improve respect for diversity (Cooper, Robinson, and McKinney, 1993; Slavin, 1983).

Several decades of empirical research have documented the effectiveness of cooperative learning in higher education. Johnson and Johnson (1986) found that cooperative teams achieve greater levels of thought and retain information longer than students who work on an individual basis. This form of active learning provides students with the opportunity to not only engage in discussion, but also become critical thinkers (Totten, Sills, Digby, and Russ, 1991). Totten et al. (1991) provided support that cooperative learning not only helps achieve higher retention, but

also encouraged students to become more motivated to take greater responsibility for their own learning and participate in class discussions. Similarly, Gokhale (1995) examined the efficacy of team-based learning on test achievement at the collegiate level, and findings indicated that students who studied in a group performed better on tests. In addition, those who worked in teams scored higher on a test assessing critical thinking when compared with students who studied individually.

B. Elements of Cooperative Learning.

Johnson, Johnson, and Smith (1991) suggested that cooperative learning is more than simply “working in groups,” and should include the following: 1) positive interdependence where team members are reliant on one another to achieve a common goal, and the entire group suffers the consequences if one member fails to do his or her work; 2) individual accountability where each member of the group is held accountable for doing his or her share of the work; 3) face-to-face promotive interaction where, although some of the group work may be done on an individual basis, most of the tasks are performed through an interactive process in which each group member provides feedback, challenges one another, and teaches and encourages his or her group mates; 4) appropriate use of collaborative skills where students are provided with the opportunity to develop and implement trust-building, leadership, decision-making, communication, and conflict management skills; and 5) group processing in which team members establish group goals, the assessment of their performance as a team occurs periodically, and they often identify changes that need to be made in order for the group to function more effectively.

According to Johnson and Ahlgren (1976) and Johnson et al. (2007), group dynamics play an important role in effective collaboration, and positive interdependence or cooperation is key to a group’s ability to accomplish a common goal, while “competitively structured groups” can be a hindrance. “*Positive interdependence* exists when individuals perceive that they can reach their goals if and only if the other individuals with whom they are cooperatively linked also reach their goals and, therefore, promote each other’s efforts to achieve the goals” (Johnson et al., 2007, p. 16). However, as Onwuegbuzie, Collins, and Jiao (2009) point out, individual accountability is key to the success of the overall group and helps to prevent “social loafing,” or reduced individual effort resulting from too much dependence on other group members (p. 272).

C. Feedback, Evaluation, and Motivational Systems.

Reward structures, evaluation, and feedback are also important in guiding individual and group performance in the classroom and can help to gauge whether progress is actually being made through cooperative learning. Meyers (1997) suggested that many different forms of assessment should be implemented into small group activities, including the evaluation of presentations, assignments, and projects. Feedback from both the instructor as well as immediate feedback from the group are important forms of evaluation (Rushatz, 1992; Webb, 1985). However, Carlsmith and Cooper (2002) argued that the effectiveness of peer review may be limited if a sense of competition is held by students toward one another and adversely affects honest feedback. Additionally, students may hold the fear that their peers will find out how they rated them. To counter such a fear, removing students from their groups when filling out peer reviews likely elicits more honest responses. Another factor, which may dissuade competition and

promote cooperation, is to use a “criterion-referenced grading system” to evaluate group work rather than grading on a curve (Nilson, 1998).

D. An Integrated Approach.

Interactivity among students and teacher-student interactions are still integral to the classroom environment, particularly for feedback and guidance (Astin, 1993). The shift of the responsibility of learning onto the student can be an adjustment in the classroom, especially when students no longer see teachers as authority figures (Johnson et al., 1991; Nilson, 1998; Rhem, 1992). As Nilson (1998) states, “Introducing greater cooperation in the classroom requires role shifts for both students and instructors” (p. 110). With this new dynamic, instructors who may be more accustomed to the “banking” system of education (Freire, 1970), must adjust to the idea of relinquishing some control, while maintaining control over the direction of their students’ learning. In light of the discomfort that may result from shifting more learning responsibility onto the student, it is important for instructors to know that they can assume a successful integrated approach by combining cooperative learning and other established teaching strategies (Millis, 1990; Treisman, 1986).

E. Research Question and Hypotheses.

Although a great deal of work has explored active learning pedagogy in a variety of disciplines, this study specifically explores the efficacy of cooperative learning in the communication field. Examining how cooperative learning relates to student performance in a college level communication course raised the research question:

RQ: What is the relationship between student involvement in cooperative learning and academic performance in a communication research methods course?

Prior research on active learning has supported the effectiveness of cooperative learning on test achievement (e.g., Felder and Brent, 1994). Findings on team-based learning suggest that this pedagogical method is successful in promoting both problem-solving and critical-thinking skills. Students who perceive grades as important in a class are also expected to perform better academically than those who attribute less importance to grades. Further, an essential element of cooperative learning is one’s contribution to help achieve the group’s goal (Johnson et al., 1991; 2007). This form of active pedagogy is centered on the notion of teamwork and group orientation, interdependence, and success. Those who view accomplishment and the attainment of satisfaction through the group are predicted to be greater participants in the cooperative learning process. For these reasons, the following hypotheses are tested:

H1: Student involvement in cooperative learning is positively associated with academic performance.

H2: The importance of grades to a student is positively associated with academic performance.

H3: The importance of group success to a student is positively associated with involvement in cooperative learning.

III. Method.

A. Participants.

Twenty-four undergraduate students in a communication research course were recruited at a large Northeastern University, with implied consent obtained prior to their participation in the study. The objective of the course was to introduce to students social science research methods employed in the field of communication, including surveys, experiments, and content analysis. The sample was comprised of 40.2% males and 59.8% females, with ages ranging from 18 to 22 years ($M = 19.23$, $SD = 0.97$). Participants consisted of 87.5% Whites, 5.5% Asians, 3.2% African Americans, 2.1% Hispanics, 1.2% American Indians, and 2.5% with no indication of race.

B. Procedure.

At the start of the semester, the instructor designated groups comprised of four to six students for the purpose of completing a class research project and a series of readiness assessment tests (RATs). These groups remained consistent throughout the semester. On the day that the survey was administered, all 24 students who were enrolled in the course were required to sit with their assigned group members upon arrival. Each member in a group was assigned a number code and required to write down the codes of their group members on a separate piece of paper for reference. Students were then asked to disperse themselves in the classroom and sit apart from their group members. Each student individually completed a set of questions, which evaluated each group member's performance in a series of group exercises. Participants were told that responses would remain confidential and would not be shown to the instructor or their peers. After completion of questionnaires, all surveys were turned in to the researchers, and the students were instructed to discard the sheets listing the student codes to assure the anonymity of their group members.

C. Measures.

Participation in cooperative learning and student perception of learning. The independent variable in this study was involvement in cooperative learning. One of the primary requirements for the research methods course entailed student cooperation in groups on a research project throughout the semester. Over the course of four months, students were expected to complete a variety of research exercises related to their project during and outside of class in order to accomplish the following tasks: propose research questions, design a methodology to answer these questions, collect and analyze data, and discuss findings and conclusions. Based on the focus of group work in the course, the survey consisted of 13 items assessing a student's active participation in cooperative learning. Responses were made on a Likert-percentage scale from 0(never) to 100(always). Based on the literature and the elements that Johnson et al. (1991) suggested to take place in the cooperative learning process, this study assessed cooperative learning as it is comprised of seven components: group processing, motivation, competition, dependability, accountability, interactivity, and use of collaborative skills. Group processing was measured by a student's ability to help accomplish a group's goal and provide constructive feedback to others in the group. Motivation was measured by a student's desire to take part in the group activity. Competition was assessed by how much the

student cared about doing better than other students. Dependability was measured by the degree to which others depend on a student and vice versa to help achieve the group's goal. In addition, it incorporates the extent to which a group member comes to class prepared for the activity. Accountability was assessed by the extent to which a student does his or her share of the group work and if he or she appears to have learned all of the material involved in the project. Interactivity was measured by the degree to which a group member cooperates with others in a team, the extent to which the group and the student learn from each other, and how much one contributes his or her ideas to the group. Lastly, the use of collaborative skills was assessed by one's contribution of his or her skills to the group. In addition to measuring students' involvement in cooperative learning, the importance of four factors was also assessed: the degree to which sense of achievement, grades, peer acceptance, and group success are important to the student. Responses were made on a Likert-scale from 1(not important) to 7(very important).

Academic performance. The dependent variable in this study was academic performance. Academic performance was assessed by the student's individual scores on a series of RATs, group scores on RATs, and final grade in the class. Tests were scored and provided by the instructor of the course.

RATs. RATs are short, closed-book quizzes consisting of about 12 multiple-choice questions on a particular topic covered in class. Assigned readings from the textbook and a study guide are provided to students before the topic is covered. Quizzes are administered at the beginning of class and a total of six quizzes are given throughout a four-month period or semester. The quizzes are first taken individually and turned into the instructor. Then, students complete the same quiz with their assigned group members. After taking the quiz as a group, the answer sheet is turned into the instructor and graded. Each group will be given up to five minutes to appeal for incorrect answers. If the instructor accepts the appeal, both the group and individual scores will be changed accordingly.

Final grade. The student's final grade in the class was calculated as follows: individual RATs, group RATs, a final project, mid-semester assignments related to the project, and in-class exercises, each accounting for 20% of the final course grade.

IV. Results.

Based on the conceptual definition of cooperative learning and the grouping of the seven components previously discussed (group processing, motivation, competition, dependability, accountability, interactivity, and use of collaborative skills), the 13 items measuring involvement in cooperative learning were subjected to a reliability analysis. One item, which measured the degree to which the particular group member depended on the peer evaluator to accomplish the group goal, was excluded from further analysis because it was not internally consistent with the other items. Therefore, a mean index of the 12 items was constructed to represent the cooperative learning score for each student (Cronbach's $\alpha = 0.98$). Academic performance had three separate components: individual performance on the six RATs ($M = 77.61$, $SD = 1.08$), group performance on the six RATs ($M = 92.94$, $SD = 0.88$), and final course grade ($M = 87.79$, $SD = 1.56$).

Bivariate correlations were employed to test the relationship between involvement in cooperative learning and academic performance. Significant positive relationships were found between student involvement in cooperative learning and each of the three components assessing academic performance, supporting the first hypothesis (see Table 1). Findings indicate that the more actively a student participated in cooperative learning, the higher a student scored on average on individual and group RATs and their final course grade.

Table 1. Correlations between involvement in cooperative learning and academic performance.

| | Individual RAT scores | Group RAT scores | Final Course Grade |
|-------------------------------------|-----------------------|------------------|--------------------|
| Involvement in Cooperative Learning | 0.62*** | 0.46*** | 0.58*** |

*** $p < 0.001$

Another set of analysis examined the level of importance of sense of achievement, grades, peer acceptance, and group success to a student in class. Bivariate correlations were performed to determine the relationships between these variables and involvement in cooperative learning and academic performance (see Table 2). Results indicated significant positive relationships between the importance of grades and involvement in cooperative learning, as well as that with academic performance on individual RATs and final course evaluation, showing support for the second hypothesis. The importance of sense of achievement was also a significant predictor of a student's individual performance on RATs. However, no significant relationship was found between the importance of group success and involvement in cooperative learning, showing no support for the third hypothesis.

Table 2. Correlations between importance of sense of achievement, grades, peer acceptance, and group success and involvement in cooperative learning and academic performance.

| Importance to Student in Class | Involvement in Cooperative Learning | Individual RAT Scores | Group RAT Scores | Final Course Grade |
|--------------------------------|-------------------------------------|-----------------------|------------------|--------------------|
| Sense of Achievement | 0.09 | 0.17* | 0.02 | 0.06 |
| Grades | 0.18* | 0.25* | 0.10 | 0.17* |
| Peer Acceptance | 0.01 | 0.08 | 0.002 | 0.05 |
| Group Success | 0.04 | 0.03 | 0.0003 | 0.04 |

* $p < 0.05$

A regression analysis was carried out to examine the relationship between a student's involvement in cooperative learning and a separate in-class peer evaluation administered by the instructor. The peer evaluation was conducted on the last day of class and required students to provide written open-ended evaluations about the ways in which each member, including himself or herself, contributed to the final group project. Students also indicated the percentage of contribution for each group member. Based on these percentage contributions, the instructor of the course scored each individual on a Likert-scale from 1(low) to 10(high) in terms of participation. Findings showed that a positive and significant relationship existed between student involvement in cooperative learning and peer evaluations ($\beta = 0.26, p = 0.01$).

In summary, results from the analyses suggest that involvement in cooperative learning is a strong predictor of a student's academic performance in class. A significant relationship was also found between the degree to which grades are important to a student and his or her active participation in cooperative learning for group exercises. Furthermore, the importance of grades yielded as a strong predictor of individual performance on RATs and higher final course grades.

V. Discussion.

The purpose of this case study was to examine the relationship between cooperative learning and academic performance pertaining to higher education in the field of communication. The empirical analysis provided considerable support that active participation in team-based learning has a positive relationship with a student's academic performance. Overall, students who were heavy participants in group exercises exhibiting behaviors, such as helping to accomplish the group's goal, coming to class prepared, providing constructive feedback to their peers, and cooperating with their team, had a higher likelihood of receiving better test scores and final course grades at the end of the semester. In other terms, students who were more engaged in group work also performed well outside of their groups, which was reflective of higher individual test scores and course evaluations. Moreover, the perception of grades holds significant weight in the degree to which a student participates in the cooperative learning process. Students who perceived grades as highly important were evaluated by their peers to be more active in cooperative learning, including wanting to take part in the group task, completing his or her share of the work, learning materials involved in the exercise, and verbally contributing ideas to the team.

Results from the study support the notion that cooperative learning is indeed an active pedagogy that works to foster higher academic achievement. Findings suggest that grades and group success hold greater importance to students than peer acceptance and sense of achievement, despite literature indicating the weight of interdependency on group success (Johnson et al., 1991). Grades may be a strong extrinsic motivator for students, and thus their level of importance may have been a predictor of how much effort students put in to learning their course materials or preparing for assessment tests. Furthermore, their perception of grades may encourage them to participate more in group exercises since they are driven by the attainment of the final group score, as it greatly affects individual scores. In this particular communication course, group exercise grades can only help a student's final course grade. Thus, viewing group opportunities as a form of extra credit and the group RAT scores as a reflection of the success of the team were potential factors that could have encouraged students to be more active participants in cooperative learning.

The data also provide support that the degree to which a student's sense of achievement was important to himself or herself predicted test performance on an individual basis. Sense of achievement is the feeling or awareness of personal accomplishment and success. Thus, it is logical that students who view this aspect of learning to be important may perform better on tests in accordance with Slavin's (1978) description of rewards structures.

Although an extensive body of research confirms the effectiveness of cooperative learning in higher education (Astin, 1993; Cooper, Prescott, Cook, Smith, and Cuseo, 1990), cooperative learning has several limitations. Instructors are often confronted with resistance and hostility from students who believe they are being held back by slower teammates (Shimazoe and Aldrich, 2010). In addition, such negative reactions come from the other side where weaker and less assertive students complain of being belittled or ignored by more responsive students. This study did not examine the factors that could potentially hinder student participation in cooperative learning. The desire to take part in a task and the significance of achievement and grades to students may only be limited factors that affect the degree to which a student is active in a group setting. The omission of additional variables in this study may explain why the predicted relationship between the importance of group success and involvement in cooperative learning was not significant.

As discussed, a limitation of using peer reviews is that students may feel a sense of competition toward one another, which could affect their evaluations. By moving students away from their groups while evaluating participation and by assuring them that the instructor and other students would not see the reviews, this study attempted to discourage a sense of competition and make students feel that their answers were confidential. Another limitation was that the questionnaire was administered to a small convenience sample comprised of a relatively homogenous group of undergraduate students. It is important to acknowledge that this research serves as a case study to examine the efficacy of cooperative learning in a communication research methods course. Therefore, the findings presented should be interpreted with caution in terms of generalizing them to a larger population or another culture. Future research may consider applying the same methods to study other research methods courses, as well as classes that require the same or greater demands of group work. Moreover, this study was a cross-sectional survey designed specifically to study associations between academic performance and cooperative learning rather than to draw conclusions about the effects of cooperative learning. However, despite the fact that the present research is not an experimental study, findings do indicate a positive relationship between active participation in cooperative learning and academic performance.

The relationships observed in this study apply to team-based learning in the communication discipline. This research examined the relationship between involvement in cooperative learning and academic performance and how factors, such as perceptions of grades and sense of achievement, are predictors of a student's performance in class. However, future research may explore other variables, including prior background and success in active pedagogy, student learning preferences, and interpersonal relationships among peers, which may play an integral role in the process of cooperative learning. In addition, variations in demographic factors, such as socioeconomic status, race, and gender, were not examined in the study and may influence the degree of active group involvement, familiarity, and comfort level with team members.

Other research opportunities exist in exploring how cooperative learning has progressed over the past decades. With an increasing trend of students pursuing higher education, the

question remains whether this form of active pedagogy is better suited and appropriate for smaller classes. Or, do larger lecture-oriented classes adequately provide students with the comprehensive benefits of enhancing their critical thinking and analytical skills? Furthermore, is it possible to implement active pedagogy in classes that are hundreds of students in size, exist completely online, or are hybrids delivered via face-to-face and computer-mediated-communication? Changes in higher education across disciplines may encourage modifications in the way professors select and implement their teaching strategies. With the rise in new digital media technologies and Web 2.0, smart classrooms equipped with online capabilities, and the use of course management tools and social media outlets (e.g., Wikis and Facebook), cooperative learning is in the process of being reconceptualized as a pedagogical concept. With the growing number of students in colleges and universities, it is necessary to examine the role cooperative learning plays in today's transforming academic institutions and the direction it will take in higher education in the future.

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