Enhancing Student Engagement in Learning: Integrating Cooperative Learning and Technology in College Classrooms

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Abstract

The purpose of this study was to gain insight into undergraduate perspectives of the learning process and to enhance engagement in it by exposing students to a technologically enriched, cooperative learning environment while enrolled in an undergraduate psychology "lecture" course at the college level. Throughout the semester, students were asked to provide information and feedback including demographics, perspectives of past learning experiences, an analysis of cooperative learning, and course evaluations. Analyses of student perspectives indicated that incorporating aspects of cooperative learning and technology into course curricula not only correlated with perceptions of an enhanced learning experience and greater engagement for students within the classroom but also predicted student perceptions of greater motivation to learn outside the classroom as lifelong, self-regulated learners.

Enhancing Student Engagement in Learning

Integrating Cooperative Learning and Technology in College Classrooms

It has been understood for quite some time that each student comes to class with a unique style of learning based on biology and developmental experiences. Such individuation poses an enormous challenge for educators when attempting to develop curricula where all students are presented with the best opportunity to become involved in the learning process and fulfill course objectives. The vast increase in the amount of technology available to students as learning tools has offered educators with yet another tool for enhancing student involvement and learning. Yet despite a growing trend to address this issue, the challenges remain and while technology may prove useful in meeting them it will never be a panacea. An extensive body of research delineates differences in student learning styles [1,2]. And while integrating techniques appropriate to different learning styles may seem like a simple concept; achieving a quality learning environment for all students quickly becomes a complicated task. Students have different backgrounds, abilities, and skill sets, resulting in different preferred learning styles, which are not necessarily amenable to standard approaches such as the lecture with accompanying power point (e.g., many college classrooms).

Thus, further efforts and more research on such efforts which address the issue of implementing classroom techniques that will encompass the needs of as many students as possible and enhance their engagement in the learning process and thereby -- hopefully -- their actual learning, are necessary. Several variations of classroom learning facilitation have been utilized in efforts to provide students with the best opportunity for learning [3-6]. However, efforts to develop successful methods of classroom facilitation that can be easily integrated into a variety of courses are far from complete. Additionally, these techniques are often instructor centered and dependent and fail to take a student-centered approach which encourages student empowerment or promote greater engagement in the process and encourage active learning both in and outside the classroom. Although the "classic" lecture approach to classroom facilitation can have a positive impact on the learning process when implemented by an experienced and motivated instructor; all too often it is the default option and is implemented almost rottenly, probably in a manner based on the instructors experience as a student -- what they saw, or to put it most cynical what was done to them as a college student.

Unfortunately, when done in this latter fashion it is not only ineffective because of its own short comings, but often because the target audience -- the students -- stop attending class. Here
we propose and describe an alternative (although not unique) approach to the medium to large lecture class at the college level designed to make the classroom the center of a comprehensive learning experience and put students in charge of this experience. This approach is based first on fundamental beliefs about what the goals of education should be and how learning best takes place and then finds expression for these concepts in specific techniques based on theory, research and practical experience. The fundamental concept is that learning should reach beyond the material taught in a single class. Learning is – or should be -- a lifetime process; therefore, the goals of instructors should include “teaching” students how to learn in general and in future endeavors (e.g., other courses), not just how to learn the core content material of the course for the purpose of doing well on one or more examinations. However, by taking this broader approach, we believe students are likely to become more engaged in the immediate learning process and therefore will learn the current course material more efficiently. In turn this results in their gaining a sense of self-efficacy to be able to successfully become “self-regulated,” lifetime learners who appreciate and even enjoy the learning process rather than regarding it as an onerous burden.

To provide students with an alternative to the lecture format and with the goal of providing an enhanced opportunity for engagement and learning for all students regardless of learning style, a small-group, cooperative learning (CL) approach utilizing Blackboard (Bb—a computer based learning assistance program), has been developed and implemented. Research supports the fact that cooperative learning techniques do enhance both engagement and learning [5]. However, the use of technology (e.g., Bb) in conjunction with this approach has not been examined. To date, this format has been used for classes ranging in size from 30 to approximately 150 students. Students are exposed to this “new” (for most of them) approach from the first day of class through an extensive syllabus (available on Bb) which among other things explains the concept of cooperative learning and how it will be used in the course. Of greater importance, they are immediately “thrown” into a small group cooperative learning exercise whereby they are provided with 2 pages from a ten-page article on cooperative learning by Johnson et al. [7]. Their task – as the first session of class draws to an end – is to find students who have the pages which complete the article, form a group, make sure everyone gets a full copy of the article, read the article and write a 1-2 page synopsis by the next class, which begins with them sitting in these same groups rather than (as is more often the case) sitting by themselves in the same seat they sat in on the first day.

This second-class session begins with a discussion of the concept of cooperative learning and reactions to it, with the most often raised issue being the pitfalls of “group work” especially the “slacker.” This topic provides the instructor with the opportunity to differentiate between the simplistic “get in a group” and do a project approach which most students report as disastrous and “true” cooperative learning which is characterized by structured interdependence as well as individual accountability and therefor inhibits the “slacker” effect so often found in simplistic group work. At the end of this class students are again asked to form groups to undertake the first-class assignment. At no time does the instructor form groups and students are encouraged to NOT form groups simply based on proximity or acquaintance. They are also told that the group they are forming does not have to be their permanent semester group and that they will have at least one more chance in terms of that process. Thus, student initiative and responsibility – in this case around group formation -- are promoted from day one. Ultimately, students form small groups of 4 to 6 students that (for the most part) become close-knit learning communities for the remainder of the semester. The first order of business once permanent groups is formed is to write and submit (on Bb) group contracts. These are sets of rules of conduct composed by each group and used as the basis for group regulation throughout the semester (“divorce” clauses are often featured in these contracts to deal with the slacker effect).

In this context, students work together on all levels of learning from discussing chapter materials and preparing weekly written assignments which may include chapter summaries and outlines as well developing a document entitled “What we did not understand (the “WWDNU”), which provides the basis for class discussion. In addition, students are encouraged to work together and provide support on weekly quizzes and quarterly exams all of which are taken on an open book basis on Blackboard. In this way students become self-regulated learners by taking responsibility for their own learning as well as developing a sense of mutual interdependence by assisting in the learning experiences of the students in their groups. As can be seen already, technology is a vital element in enhancing this learning experience through greater communication. Each group has its own private group page in Blackboard where interaction frequently occurs in efforts to prepare assignments. Full class discussion boards on each topic provide the opportunity for discussing problems, explaining difficult concepts, and exchanging different points of view. All assignments are posted on special boards which are available to the entire class. As already noted, weekly quizzes and exams are offered through the Blackboard medium. As a result of this approach students may utilize the talents and skills of their peers – both those in their small group as well as those of every student in the larger group – to promote successful learning. The goal becomes engagement of each student in the totality of the learning process with greater learning occurring as a function of repeat-ed multi-modal exposure to the material, i.e., through reading it, writing about it, and discussing it both in small groups as well as in class rather than engaging in simple rote memorization to take a test and receive a grade.

### Methods and Materials

#### Measures and Participants

**Demographics:** Students were asked to provide basic demographic information including year of educational attainment, major, minor, previous psychology courses taken, educational...
plans/goals and professional plans/goals. A total of 1.8% of students were freshmen, 17.3% were sophomores, 46.0% were juniors, and 35% were seniors (N = 226). Nearly two-thirds (66.3%) reported psychology as one of their majors (N = 241). Students had taken an average of 3.96 previous psychology courses prior to enrolling in this course with a range of 0 to 12 prior courses (N = 223). Considering educational goals, 57.9% reported a desire to obtain a master’s degree, 19.9% wanted to finish their undergraduate degree only, and 21.7% wanted to obtain a professional or doctoral degree.

**Past Educational Experiences**: Students were also asked to reflect and comment on a set of questions designed to determine what past classroom experiences the students had encountered, perspectives on the effectiveness of those experiences, the students’ opinions of an ideal learning environment, the students’ expectations and goals for the course, how the student planned to meet those goals, and what the student expected of the course instructor in helping meet their goals.

**Cooperative Learning Article Critique**: Students (N = 188) were exposed to the concepts of the of cooperative learning pedagogy through an article by Johnson, Johnson (1991). As part of this exposure they participated in a cooperative learning task. The students were then given an assignment to write a one to two-page article summary and critique.

**Early-Semester Feedback**: Following the first exam students (N = 152) were asked to provide semi-structured feedback related to their perspectives on the course up to that point in the semester including their perspectives on the use of cooperative learning, their experience of engagement, and the use of technology.

**End-of-Semester Feedback**: Within the final three weeks of the semester students (N = 307) were asked to provide end-of-semester feedback. The format modeled the early-semesters feedback.

**Results**

**Overview**

A combination of multiple regression analyses, descriptive statistics, and correlational analyses were utilized to determine student perceptions of ideal learning environments, experience of engagement, and effectiveness of technology use.

**Past Experiences and Cooperative Learning Article**

A total of 18.4% had experienced a “true” cooperative learning environment prior to enrollment in this course (N=188). Of those who had experienced cooperative learning in the past (N = 35), 71.4% perceived their experience to be positive. After reading the cooperative learning article by Johnson et al. (1991), nearly 97% of students expressed a correct understanding of cooperative learning as defined in the article. Additionally, 75.5% reported a positive outlook on the course even though 60.8% of those discussing past group experiences rated the experiences as negative or a mix of positive and negative.

**Semester Feedback**

A simultaneous regression analysis was utilized to determine what factors best-predicted students feeling the motivation to learn more both in and outside the classroom midway through the semester. These factors included explanation of course objectives and methodologies, course assignments, having learning needs met, using many methods to teach the course, using small groups, having opportunities for discussion and asking questions, motivation from the instructor, utilization of Blackboard, and feeling positive about the ability to be a self-regulated learner. Results indicated that the overall model did significantly predict motivation to learn, \( R^2 = 0.63, \) \( F(9, 52) = 9.98, p < 0.001 \). Having assignments that were perceived as positively contributing to learning \( (r^2 = 0.04, p = 0.02) \), utilizing small groups \( (r^2 = 0.07, p < 0.004) \), and instructor motivation \( (r^2 = 0.03, p = 0.054) \) each uniquely significantly predicted the variance in motivation toward learning. At the end of the semester, this model remained significant, \( R^2 = 0.583 \), \( F(9, 291) = 45.14, p < 0.001 \); however, predictors that uniquely predicted variance changed slightly and included having learning needs met \( (r^2 = 0.038, p < 0.001) \), utilizing small groups \( (r^2 = 0.013, p < 0.004) \), and instructor motivation \( (r^2 = 0.045, p < 0.001) \).

A step-down analysis was conducted using both the early and end-of semester feedback to determine what combination of factors best significantly predicted student perceptions of having the abilities to be self-regulated learners. Predictor variables included those utilized in the simultaneous regressions previously run. Results indicated that the entire model did significantly predict ability to be a self-regulated learner midway through the semester \( (R^2 = 0.42, F(9, 52) = 4.14, p < 0.001) \) and at the end of the semester \( (R^2 = 0.34, F(9, 291) = 16.64, p < 0.001) \). Midway through the semester, ability to be a self-regulated learner was significantly predicted solely by having learning needs met, which accounted for 35.5% of the variance \( (R^2 = 0.355) \) with \( F(1, 60) = 32.98, p < 0.001 \). By the end of the semester, ability to be a self-regulated learner was significantly predicted by having learning needs met and utilizing Bb, which together accounted for 31.6% of the variance \( (R^2 = 0.316) \) with \( F(2, 301) = 69.65, p < 0.001 \). Having learning needs met uniquely predicted 13.2% of the variance in the model \( (r^2 = 0.132) \) while the use of Bb uniquely predicted 4.2% of the variance in the model \( (r^2 = 0.042) \).

**Significant Technology-Related Correlations**

Students who more strongly agreed that Bb had enhanced their learning experience also felt that course objectives had been well-defined \( (r = 0.49, p < 0.001) \), that course assignments were positively contributing to learning \( (r = 0.56, p < 0.001) \), that their learning needs were met \( (r = 0.48, p < 0.001) \), that many methods had been utilized to help learn course materials \( (r = 0.51, p < 0.001) \), that small groups had been beneficial \( (r = 0.50, p < 0.001) \), that they were more motivated to learn both in and outside the classroom \( (r = 0.38, p < 0.001) \), and that they had the abilities to be self-regulated learners \( (r = 0.44, p < 0.001) \).
Conclusion

Many challenges still exist for educators attempting to develop the most conducive educational environment for students of all ages. The results of this study suggest that the learning environment must incorporate not only the basic tools for successfully learning the objectives outlined in a single course curriculum ideally also instill individual empowerment as a basis for engaging the student in the learning process. It seems clear that one such approach is a cooperative learning based, technology-enhanced classroom. As the students participating in this study have clearly expressed, participation in small groups through cooperative learning and the integration of online learning tools such as Bb were related to the perception that learning needs had been met, and along with a sense of consistent instructor motivation, seem to best predict students feeling motivated to learn more, both in and out of the classroom, and increased self-perception of having the capabilities to be successful life-long, self-regulated learners.

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