Does classroom participation improve student learning?

Harry G. Murray and Megan Lang
Psychology, University of Western Ontario

It is widely claimed that active student participation in the college classroom facilitates both acquisition of knowledge and development of problem solving skills. However, there is very little empirical evidence to either confirm or deny this view. This paper reports two studies, one observational and one experimental, the results of which support the view that active classroom participation does indeed improve student learning.

The current literature on higher education places considerable emphasis on the limitations of the lecture method of teaching and the need for more active student participation in the classroom. It is argued that students play too passive a role in lectures, furthermore, the pace of presentation is too fast, and the main emphasis is on rote memorisation rather than meaningful understanding. To remedy this situation, it is recommended that university teachers make greater use of instructional techniques that require active student participation, such as class discussion, cooperative learning, debates, role-playing, problem-based learning, and case studies (for example, Meyers and Jones, 1993). Underlying this recommendation is the assumption that students who participate actively in the classroom will in fact learn the subject matter more effectively than students taught in the traditional lecture mode, and in addition, will show greater development in areas such as oral communication, critical thinking, and problem solving. Although this assumption seems reasonable and intuitively appealing, there is surprisingly little empirical evidence in the literature on the extent to which active classroom participation actually does facilitate student learning and problem solving. Of the few empirical studies reported in this area, most were done in the laboratory rather than in actual classrooms, and of those done in the field, many were weak in internal validity and/or failed to include the types of instructional outcomes (for example, problem solving) believed to be most strongly influenced by active participation (Murray, 1991; Smith, 1977).

The present research was designed to provide a systematic empirical test of the impact of active student participation in an actual classroom context, using a full range of student outcome measures, including problem solving, and with as much control over extraneous variables as is possible under field conditions. Two separate studies, one observational and one experimental, were carried out in an undergraduate Educational Psychology course, Psychology 261, taught by the first author. The course in question has several characteristics that make it a desirable context for research on classroom participation. For one thing, it is taught in a lecture-discussion format that provides lots of opportunity for student participation. In addition to formal lectures, which comprise about 50 percent of class time, class sessions include debates, question-answer dialogues, and small-group discussions of problems and cases. The normal annual enrollment in Psychology 261 is 50 to 60 students, most of whom are psychology majors who plan to enter the Faculty of Education and become school teachers. Approximately 80 to 90 percent of class members are female. Final grades in the course are determined as follows: two written assignments (20%), class participation (10%), practicum (10%), and three term tests covering successive thirds of the course content (60%). Each term test typically includes 40 multiple-choice questions written at the Knowledge or Comprehension levels of Bloom's taxonomy, and 4 one-page, focused essay questions written at the Application, Analysis, Synthesis, or Evaluation levels. For purposes of the present research project, performance on multiple-choice exam questions was used as a measure of content learning, whereas performance on essay questions was used as a measure of problem solving.

In Study 1, Psychology 261 class meetings were systematically observed by two trained observers who recorded frequency of classroom participation for each of 59 students. Students were informed at the beginning of the course that a study involving non-obtrusive classroom observation would be conducted and were asked if they were willing to be included. All but 2 students gave informed consent. Students used name tags in early class sessions to facilitate identification by observers (and by other students). Each of the two observers attended all class sessions and independently recorded all instances of participation by each student, including questions, comments, contribution to small-group discussion, and reaction to comments of other students. Based on these observations, each observer assigned each student a participation score ranging from 0 to 100. The inter-rater reliability of ratings independently assigned by the two observers was 0.84. The two ratings were averaged to provide a single measure of participation for each student, which was then entered into a multiple regression analysis as a predictor of mean percentage score on the three term tests. The simple, uncorrected correlation between frequency of participation and student exam performance was 0.67, indicating that students who participated more frequently in class did in fact tend to show...
higher levels of content knowledge and problem solving. It is possible, of course, that this correlation was due not to the effects of class participation per se, but to a tendency for brighter or more motivated students to (1) participate more frequently in class, and (2) perform better on tests than less bright or less motivated students. To check on this possibility, each student’s average grade from previous university courses was entered in Step 1 of the multiple regression to statistically control for the combined effects of student ability and motivation. With prior grades statistically controlled, the correlation between amount of course participation and exam performance was reduced to 0.36, but was still statistically significant. This result suggests that active classroom participation is significantly associated with student learning of course content and problem-solving skill.

Study 2 was carried out by the second author, under the supervision of the first author, as a senior honours thesis at the University of Western Ontario (Lang, 1996). To determine more clearly whether a cause-effect relationship exists between classroom participation and student learning, classroom participation was experimentally manipulated, rather than letting it vary naturally, with other relevant variables controlled. To make the study as ‘natural’ and non-disruptive as possible, and to avoid ethical problems inherent in manipulating participation across groups of students, classroom participation was varied across the 74 different topic areas covered in the Psychology 261 curriculum. Specifically, 20 topic areas were randomly assigned to be taught by an ‘active participation’ method, while 54 topics were randomly assigned to be taught by a control or ‘lecture only’ method. Topics taught by participation were introduced by a brief lecture overview, but at least 75 percent of class time was spent in activities requiring student participation (for example, small-group discussion, question-answer dialogue, case study, debates).

FIGURE 1: Mean Exam Performance as a Function of Teaching Method

FIGURE 2: Mean Course Ratings as a Function of Teaching Method

Topics taught by lecture provided some opportunity for student questions, but at least 75 percent of class time consisted of formal one-way lecturing by the instructor. Lecture and active participation conditions were compared on two types of outcome measures: (1) student exam performance, and (2) student attitudes. Each of the three term tests in Study 2 included 40 multiple-choice questions divided among three approximately equal subsets: those testing topics taught by lecture, those testing topics taught by active participation, and those testing topics covered in the textbook but not presented in class. Similarly, each term test included 4 essay questions, 2 testing topics taught by lecture, and 2 testing topics taught by active participation. Exam questions were selected by the instructor according to an ‘exam blueprint,’ but were graded by a teaching assistant who had no knowledge of the study being conducted. Results were averaged across the three term tests for each student and transformed into percentage terms. The second dependent variable in Study 2, namely student attitudes, was measured by questionnaires administered to students concurrently with the three term tests. Students were asked to rate each of the topics covered on a given term test, including those taught by lecture and those taught by active participation, on 9-point rating scales assessing (1) amount learned about the topic, (2) amount of study time, (3) perceived quality of teaching, and (4) motivation for further learning.

The results of Study 2 are summarized in Figures 1 and 2. Figure 1 shows that mean student performance on both multiple-choice and essay exam questions was better for topics taught by active participation than for topics taught by lecture. Furthermore, multiple-choice performance was in turn better for topics taught by lecture than for topics covered in the textbook only.
Figure 2 shows that, on average, students rated topics taught by active participation more positively than topics taught by lecture in terms of motivation for further learning, perceived quality of instruction, amount learned, and amount of study time. Except for rated amount of studying, all differences in Figures 1 and 2 are statistically significant.

The results of Study 2 in combination with those of Study 1 support the conclusion that, at least under certain conditions, active participation in the college classroom does in fact improve student learning of course content and development of problem solving skill. A positive association between active participation and student achievement was demonstrated in two separate studies done in an actual classroom setting but using very different research designs, one involving naturalistic observation and one involving experimental manipulation. Given that the previous literature on classroom participation has been characterized by an abundance of theory and a severe shortage of confirming empirical evidence, the present study represents a potentially important contribution. The possibility exists, however, that facilitative effects of active participation are found only under instructional conditions similar to those of the present study. Whether these results will generalize to other types of students and other types of courses can be determined only through further research.

References


Notes

1. Now at Faculty of Education, University of Western Ontario.

2. This research was supported by a UWO internal research grant from the Social Sciences and Humanities Research Council of Canada.