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AUTHOR Magney, John R.
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ABSTRACT

A questionnaire on use of cooperative learning was distributed to all faculty (76 respondents) in the College of Technical Careers at Southern Illinois-Carbondale (SIUC) and a sample of the membership (66 respondents) of the American Technical Education Association (ATEA). For both samples, the main use of groupwork was with laboratory assignments, problem-solving practice, and discussions of lectures and course materials. About one-third of the instructors permit students to work in groups on term papers and class presentations; fewer than 10 percent allow groupwork on quizzes and examinations. About 60% of the SIUC instructors and 39% of the ATEA respondents said they knew very little or nothing about the technique of cooperative learning. Instructors with more knowledge were more likely to do the following: use small group techniques in all their classes; assign students to groups rather than let students self-select into groups; provide students with training in group processes; and report that students in groups achieve higher grades, learn more and learn more quickly than students working individually. Groupwork enhanced student learning of course content and promoted the development of student skills in group processes and involvement in courses. Problems included time management and coverage of material, grading policies, and "free riding" by group members. (Contains 10 references.) (KC)

USING COOPERATIVE LEARNING IN THE TECHNICAL CLASSROOM

John R. Magney
Dept. of Technical & Resource Management
Southern Illinois University at Carbondale

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Introduction

Cooperative learning is an instructional methodology which has had considerable impact on educators. Students routinely attain higher levels of subject matter learning when they work in groups. They also build up their social skills in communications, conflict resolution and group decision-making. Both of these outcomes have been widely documented in research on cooperative learning. The second finding -- on the social impact of cooperative learning -- makes it especially relevant today given the great emphasis on teamwork in the workplace.

In this presentation I will be taking a look at how cooperative learning has been applied in the contemporary postsecondary technical classroom. I will cite some of my own experiences with cooperative learning, a few "expert" opinions, and -- perhaps most importantly -- findings from two surveys of technical educators, one being the faculty at a university-level technical college and the other being a national sample of instructors at mainly two-year colleges.

The Research: Methods and Results

Although we have a huge research literature on the learning effects of cooperative learning, there have been relatively few studies of the practical experiences of those who use the technique. At the college level, the main source of research data about the practice of cooperative learning is a slim volume published by the National Center for Postsecondary Teaching, Learning and Assessment (Goodsell, Maher and Tinto, 1992). These studies report on several student surveys, mostly in business schools, and offer a number of guidelines for group selection, class activities, teacher roles and grading practices. Probably the best known "how to do it" manual on cooperative learning in higher education, by Johnson, Johnson and Smith (1991), is based on the authors' own experiences in using the method. They describe the different group techniques that can be used, including group tests and exams, and the need for instructors to actively monitor and manage classroom activities.

A year ago, based on my growing practical interest in cooperative learning, I decided to survey my technical colleagues to find out what experiences they might have had with the technique. I developed a relatively short (29 item) questionnaire to find out who was using group techniques, why they were doing so, and what they were actually doing in their classrooms. The questionnaire was then sent out to two groups: (1) all faculty in the College of Technical Careers at Southern Illinois University at Carbondale, and (2) a sample of the national teaching membership of the American Technical Education Association (ATEA). Teaching assignments in the College of Technical Careers (recently renamed College of Applied Sciences and Arts) are in both two- and four-year degree programs, while ATEA members teach mostly at two-year technical and community colleges. Responses came back from 76 of my SIUC colleagues (a 49 percent response rate) and from 66 of those in the ATEA sample (a 32 percent response rate).

Groupwork turned out to be a commonly used technique in both of the surveys. In response to a question about whether "you ever divide up your classes into small groups (or teams) for the purpose of some kind of learning activity," 64 percent of my SIUC colleagues and 88 percent of the ATEA respondents answered "yes." Most of those who reported using group techniques have been doing so for a number of years, an average of 9.8 years for the SIUC users and an average of 11.5 years for the ATEA users. In response to a question about what influenced their decision to begin using group techniques, the leading factor cited by respondents in both surveys (over 50 percent) was "previous experience with group work" (either as a student or in the workplace or other contexts).

There was no consensus in either survey about the appropriate label for classroom groupwork. About half the instructors described their method as some kind of "group activity...project...[or] collaboration;" about a quarter of them used terms referring to "teamwork;" and the others used a variety of other terms. A pragmatic question about the "best" size for a classroom group elicited a similar response in both surveys; most instructors (about 70 percent) said it would be from 3 to 5 students.

Another pragmatic issue has to do with the types of classroom activities that can be organized around groupwork. Some cooperative learning theorists claim that groups can handle virtually any activity (Johnson, Johnson and Smith, 1991). Perhaps so, but I found some marked differences in the areas where my SIUC colleagues and ATEA members have their students working in groups. Both surveys reported the main use of groupwork was with laboratory assignments, problem-solving practice and discussions of lectures and course material. Some instructors (about a third) also permit students to work in groups on term papers/projects and class presentations. Only a very small number (less than 10 percent) allow groupwork on quizzes and examinations.

When students are involved in some type of collaborative work in a class, instructors must decide how to grade that activity. In both surveys, about two-thirds of the respondents indicated they assign a collective group grade for groupwork. A smaller number (about a third in each survey) said they also use peer evaluations by students as part of their grading systems.

Interestingly, those who use groupwork techniques may or may not have much of an understanding of cooperative learning. In response to a question about their knowledge of "the instructional method of cooperative learning," 60 percent of my SIUC colleagues and 39 percent of the ATEA respondents said they knew "very little" or "nothing" about the technique. Knowing something about cooperative learning does makes a difference, however. When instructors reporting a "fair" or "extensive" knowledge of cooperative learning were compared to those knowing "very little" or "nothing," I found that those with some knowledgeof the technique were much more likely to: (1) use small group techniques in all of their classes; (2) assign students to groups all of the time rather than let students self-select themselves into groups; (3) provide students with training and instruction in group processes; and (4) report that students in groups achieve higher grades, learn more and learn material more quickly than students working individually. Those with some knowledge of cooperative learning also indicated higher levels of interest in new methods of classroom instruction in general. All of these knowledge effects were found in both survey groups.

The final question in both surveys asked all instructors using groupwork to give a summary description of their views on "the pros and cons of using the small group technique." The two most frequently mentioned "benefits" were that groupwork (1) enhances student learning of course content (students learn more and/or learn it faster) and (2) promotes the development of student skills in group processes and teamwork. Also cited was the higher level of student interest, enjoyment and involvement in courses with groupwork. In discussing the "pitfalls" of groupwork, instructors cited a variety of time management problems: More time is required for preparing classes and overseeing student work, less time is available for lecturing, not as much material may be covered, and grading policies often need to be revised. Many also cited the problems of "free riding" and interpersonal conflict which have to be dealt with in groupwork classes.

Conclusions: Some Practical Lessons

The use of groupwork would seem to be a rather common practice in technical education. The evidence from my two surveys is fairly compelling on this point. My surveys also point to the need to look closely at what is described as groupwork. Groupwork can be a quite limited experience (as in the traditional pairings for laboratory work) or it can be a very involving experience (as in classrooms where

almost everything is done collaboratively). The type of classroom experience which has the most relevance for the needs of today's teamwork-oriented workplace is one in which students receive explicit training in group process skills. That type of experience, as we have seen, is most likely to occur when instructors have an understanding of the methodology of cooperative learning. A key part of the practice of cooperative learning involves "communicating to students the need for social skills, defining and modeling the skills, having students practice the skills over and over again...until the skills are fully integrated into the students' behavioral repertoire" (Johnson and Johnson, 1989, p. 205).

The decision to use the cooperative learning model requires that you deal with a series of practical issues about your role as a teacher and the structure of activites in your classroom. And this, as Smith and MacGregor (1992, p. 180) note, can be quite challenging: "Collaborative learning situations require a demanding yet important rethinking of one's syllabus, in terms of course content and time allocation...Teaching in collaborative situations puts the tension between the process of student learning and course content front and center." In reworking your course syllabus, you may be able to cover most of the material you normally cover during a semester, but you won't be able to cover it the same way. All of the time you allocate to group activities will reduce your time for lecturing. Your syllabus should include a program of activities for your groups, perhaps some rules about interpersonal conduct, and an explanation of how students will be evaluated. The use of group grades is a very plausible (and widely used) method for evaluating groupwork, but it opens up an opportunity for "free riding." Some instructors deal with the free rider problem by including student peer evaluations in their grading systems.

Group process issues need to be dealt with on the first day of a cooperative learning class, when students are placed into groups. Research by Fiechtner and Davis (1992) suggest that it is not advisable to let students self-select themselves into groups (mainly because this is likely to lead to socially and academically homogenous units). Group assignments should be done either randomly or based on information from a student questionnaire. Once a class is underway, instructors need to maintain a cooperative atmosphere in which students in their groups "get to know and trust each other, communicate accurately and unambiguously, accept and support one another, and resolve conflicts unambiguously" (Johnson, Johnson and Smith, 1991, p. 3:9). Instructional feedback is especially appropriate when problems occur in groups. In my classes, some of our most intense (and productive) discussions have been prompted by the free rider issue. We have never "solved" the problem, but students have left these sessions with a deeper understanding of free riding and why it also occurs in workplace teams.

The challenges involved in cooperative learning are more easily dealt with when practioners have the opportunity to network and share experiences with each other. In my college, when I did the survey last year, I became a focal point for discussions

about the technique, which was quite helpful for my own classroom practice. We need to have more opportunities for this type of networking about cooperative learning in technical education, especially at the college level. Our professional associations should be offering more workshops and training in the technique. We need to do more cooperative teaching of each other so that we become more proficient in our classroom use of teamwork and cooperative learning.

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