

Using Cooperative Learning in the College Classroom

By Pamela G. George

As a Fulbright Professor teaching at the University of Chiang Mai in Thailand some years ago, I experienced the sort of challenge to a fiercely held value that comes too rarely in a professor's worklife.

I noticed that my bright and diligent graduate students—soon to be professors at teacher-training colleges across the country—were obviously cheating: They were handing in almost identical assignments.

I didn't know exactly how to handle this disturbing situation that crossed cultural and language barriers. After stewing for several weeks and becoming convinced that the similarity in assignments was no coincidence, characteristically American, I bluntly asked them about it.

The students told me they worked together more than four hours a day after class in their "homework cartel." They proudly announced their motive was to

impress me in class with their studiousness and competence.

This threw me into a state of disequilibrium. In my 20 years of teaching, I had always highly valued individual performance—yet I'd never had students before who spent 8 to 10 hours per week preparing for my classes.

Eventually, I found ways to use the students' "homework cartel" to my and their learning advantage and so began a new adventure in teaching.

Today we would say those Thai students were practicing the important pedagogical strategy of cooperative learning—an instructional method in which students collaborate in small groups or dyads to help each other learn.

Researchers have produced in the last decade a considerable volume of research demonstrating the effectiveness of cooperative learning methods and collaborative instructional strategies. But most of this research has been at the

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elementary and secondary level.¹

Acceptance of cooperative learning for college classrooms, though increasing, has come slower.² Simply not enough empirical research has been done in the post-secondary environment or with adult learners.³ So, in an attempt to move the process along, I conducted my own experiment with cooperative learning methods.⁴

The experiment's purpose: to compare, using empirical research methodology, traditional individual methods and cooperative learning methods.

The hypothesis: College students taught using cooperative methods would have higher measures of achievement and better attitudes toward instruction than those taught using traditional individual-oriented methods.

For the experiment, I used two of eight regular undergraduate classes in educational psychology at a mid-size state university.

In both classes, students received the same course materials, had the same instructor, the same curriculum, equal numbers of out-of-class and in-class assignments, the same schedule of instruction and equivalent methods of evaluation.

The two classes were randomly assigned—no student had prior knowledge of the planned experiment or which type of instruction

would be used with which class. The cooperative method class (N=30) and individual method class (N=31) did not differ substantially or significantly in composition by gender, age, ethnicity, or GPA.

The cooperative group used three common cooperative learning methods. These were chosen because they had been well-explained and field-trialed in the literature and had comparable alternative individualized methods. These methods are described below.

The cooperative group used a collaborative answering technique called "Think-Pair-Share."⁵ Students listened to teacher-posed questions from out-of-class readings. They were given time to think of a response, paired with their "learning partner," called on (using cards bearing their names drawn randomly), and invited to share their collaborative response with the whole group.

In the individually oriented group, students were called on and answered individually.

In another example, cooperative group students in a "paired heads together" session would confer with their partners before answering a question, while the individual class student, in a similar session, would answer the question individually.

Limited empirical research has been done in the entire fields of cooperative learning and peer-tutoring.

Using a dyad structure, called "Drill-and-Review Dyads,"⁶ cooperative students were randomly assigned to "learning partners," with one partner cast as the "recaller" and the other the "listener." The dyads were asked, during each class, to review the models, demonstrations, and key concepts presented. Roles of recaller and listener were reversed every other assignment.

Students assigned to the traditional class were given the same presentations, review time, and assignments, but they worked individually.

The "Drill-and-Review Dyad" structure is a type of "peer tutoring" where both participants take turns being the "tutor." The cooperative partners in the dyad are assumed to have the same knowledge of the content.

The application of peer tutoring strategies to university settings has been defended in the literature,⁷ but limited empirical research has been done on peer-tutoring beyond that with elementary and secondary students.

The limited research on peer-tutoring that might be relevant to college teaching indicates that it improves the academic performances and attitudes of both the student who tutors and the student who is tutored.⁸

Because Slavin⁹ found peer tutoring is more valuable for tutors than those students being tutored, I chose to use a dyad structure where each student participated in both roles.

In the cooperative class, a group grade for each dyad was factored into the final grade and worth 10 percent of the total grade for each individual student. Slavin has identified group incentive, a factor that motivates students to urge fellow students to perform well, to be the single most important component for improving achievement outcomes.

In contrast to these cooperative methods, students in the traditional class were taught using methods that stressed individual learning and independent work. These included individual review instead of "drill-review-dyads," solitary rather than collaborative responses to teacher-posed questions, and a standard, norm-referenced grading scheme with no group-grading incentive.

In the cooperative class, students were assigned "learning partners" and remained in those dyads for the entire 18 weeks. Those learning partnerships were used for the drill-review dyad, the "Think-Pair-Share" structure, and the group grade incentive.

A typical class had a short presentation of material, a question-

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and-answer session on information covered in the presentation and readings (the cooperative group used collaborative answering and the individual group used individual answering), and a break-out assignment (the cooperative group students used the peer-tutoring technique of “Drill-Review Dyad” and the individual group students worked alone).

Achievement was measured using test scores (two exam scores and 12 quiz grades). Attitudes toward instructional effectiveness were measured on a standardized student evaluation instrument, using a scale of 1–5, rating the quality of instruction.

Comparing achievement for the two groups, I found that the cooperative class outperformed the traditional individual class. The outcomes were analyzed for differences in the mean scores of the two groups using a *t* test for independent samples.

Overall test scores for the cooperative group were significantly higher, $t(59) = -1.968$, $p < 0.025$. Additionally, the final exam comparison, $t(59) = -2.644$, $p < 0.01$, demonstrated even more difference between the two groups.

I also found that the use of cooperative methodologies promotes more positive attitudes toward classroom instruction.

On eight indices of a standardized university-wide student evaluation instrument, the cooperative method group rated the instruction far more favorably than the individual method group.

The cooperative group, over the individual group, rated these typical course characteristics as stronger: ($p < 0.05$), arousal of interest ($p < 0.001$), improvement of critical thinking ($p < 0.01$), effectiveness of methods ($p < 0.05$), and overall instructional quality ($p < 0.05$). Other characteristics—consistency of goals and course organization (important areas treated the same in both groups)—were not rated significantly different by the two groups.

This research corroborates the idea that cooperative learning methods employed thoughtfully and strategically can improve the achievement of college students.

I am now replacing my professor-centered classroom with a more student-centered one. This shift has not been entirely comfortable for me—I have spent decades on “center stage” in my teaching. But with this new found evidence, cooperative learning methods are becoming my newest teaching strategies. The Thai students’ “homework cartel” helped me to create more effective American college classrooms. ■

Endnotes

- ¹ Slavin, 1990a; Slavin, 1990b; Krajcik, et. al., 1994; Ventimiglia, 1994; Caplow and Hardesh, 1995; Johnson, Johnson, and Smith, 1991b; Millis, 1991; Walker, 1996; Cooper, 1994; Cramer, 1994; Groccia and Miller, 1996. Van Voorhis, 1995; Slavin, 1996. Enthusiasm for cooperative methods derives largely from evidence that cooperative methods increase achievement in elementary and secondary students, or are based on anecdotal evidence supporting students' increased enthusiasm, positive classroom interactions between race, gender and age groups, improved learners' self-esteem, improved achievement, or enhanced motivation.
- ² Johnson, Johnson, and Smith, 1991 a/b; George, 1994. Well known are the books of David and Roger Johnson, the research of Robert Slavin, and the faculty training work of Barbara Millis, all aimed at detailing the practice of cooperative learning.
- ³ Sherman, 1991; Millis, 1991; Goodsell, et. al., 1992; Halpern, et. al., 1994.
- ⁴ George, 1998.
- ⁵ Lyman, 1991.
- ⁶ Johnson, Johnson, and Smith, 1991a.
- ⁷ Sherman, 1991; Groccia and Miller, 1996.
- ⁸ McCown and Roop, 1992.
- ⁹ 1994.

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