

Cooperative Learning and the Cooperative School

The availability of models that can be used in math, reading, and writing at every grade level has made it possible to plan an elementary school around the concept of everyone's working together to improve all aspects of the school.



The Age of Cooperation is approaching. From Alaska to California to Florida to New York, from Australia to Britain to Norway to Israel, teachers and administrators are discovering an untapped resource for accelerating students' achievement: the students themselves. There is now substantial evidence that students working together in small cooperative groups can master material presented by the teacher better than can students working on their own.

The idea that people working together toward a common goal can accomplish more than people working by themselves is a well-established principle of social psychology. What is new is that practical cooperative learning strategies for classroom use have been developed, researched, and found to be instructionally effective in elementary and secondary schools. Once thought of primarily as social methods directed at social goals, certain forms of cooperative learning are considerably more effective than traditional methods in increasing basic achievement outcomes, including performance on standardized tests of mathematics, reading, and language (Slavin 1983a, b; Slavin in press a).

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Recently, a small but growing number of elementary and secondary schools have begun to apply cooperative principles at the school as well as the classroom level, involving teachers in cooperative planning, peer coaching, and team teaching, with these activities directed toward effective implementation of cooperative learning in the classroom. Many of these schools are working toward institutionalization of cooperative principles as the focus of school renewal.

This article reviews the research on cooperative learning methods and presents a vision of the next step in the progression of cooperative learning: the cooperative school.

What Is Cooperative Learning and Why Does It Work?

Cooperative learning refers to a set of instructional methods in which students work in small, mixed-ability learning groups. (See p. 11 for a vignette about one day in the life of a

hypothetical cooperative school.) The groups usually have four members—one high achiever, two average achievers, and one low achiever. The students in each group are responsible not only for learning the material being taught in class, but also for helping their groupmates learn. Often, there is some sort of group goal. For example, in the Student Team Learning methods developed at Johns Hopkins University (Slavin 1986), students can earn attractive certificates if group averages exceed a pre-established criterion of excellence.

For example, the simplest form of Student Team Learning, called Student Teams-Achievement Division (STAD), consists of a regular cycle of activities. First, the teacher presents a lesson to the class. Then students, in their four-member mixed-ability teams, work to master the material. Students usually have worksheets or other materials; study strategies within the teams depend on the subject matter. In math,



Students, like teachers, learn by explaining a lesson. When students have to organize their thoughts to communicate ideas to teammates, they engage in cognitive elaboration that enhances their own understanding.

students might work problems and then compare answers, discussing and resolving any discrepancies. In spelling, students might drill one another on spelling lists. In social studies, students might work together to find information in the text relating to key concepts. Regardless of the subject matter, students are encouraged not just to give answers but to explain ideas or skills to one another.

At the end of the team study period, students take brief individual quizzes, on which they cannot help one another. Teachers sum the results of the quizzes to form team scores, using a system that assigns points based on how much individual students have improved over their own past records.

The changes in classroom organization required by STAD are not revolutionary. To review the process, the teacher presents the initial lesson as in traditional instruction. Students then work on worksheets or other practice activities; they happen to work in teams, but otherwise the idea of practice following instruction is hardly new. Finally, students take a brief, individual quiz.

Yet, even though changes in classroom organization are moderate, the effects of cooperative learning on students can be profound. Because one student's success in the traditional classroom makes it more difficult for others to succeed (by raising the curve or raising the teacher's expectations), working hard on academic tasks can cause a student to be labeled as a "nerd" or a "teacher's pet." For this reason, students often express norms to one another that discourage academic work. In contrast, when students are working together toward a common goal, academic work becomes an activity valued by peers. Just as hard work in sports is valued by peers because a team member's success brings credit to the team and the school, so academic work is valued by peers in cooperative learning classes because it helps the team to succeed.

In addition to motivating students to do their best, cooperative learning also motivates students to help one another learn. This is important for several reasons. First, students are of-

ten able to translate the teacher's language into "kid language" for one another. Students who fail to grasp fully a concept the teacher has presented can often profit from discussing the concept with peers who are wrestling with the same questions.

Second, students who explain to one another learn by doing so. Every teacher knows that we learn by teaching. When students have to organize their thoughts to explain ideas to teammates, they must engage in cognitive elaboration that greatly enhances their own understanding (see Dansereau 1985).

Third, students can provide individual attention and assistance to one another. Because they work one-on-one, students can do an excellent job of finding out whether their peers have the idea or need additional explanation. In a traditional classroom, students who don't understand what is going on can scrunch down in their seats and hope the teacher won't call on them. In a cooperative team, there is nowhere to hide; there is a helpful, nonthreatening environment in which to try out ideas and ask for assistance. A student who gives an answer in a whole-class lesson risks being laughed at if the answer is wrong; in a cooperative team, the fact that the team has a "we're all in this together" attitude means that, when they don't understand, students are likely to receive help rather than derision.

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Under What Conditions Is Cooperative Learning Effective?

Cooperative learning is always fun; it almost always produces gains in social outcomes such as race relations; and it has never been found to reduce student achievement in comparison to traditional methods. However, a substantial body of research has established that two conditions must be fulfilled if cooperative learning is to enhance student achievement substantially. First, students must be working toward a group goal, such as earning certificates or some other recognition. Second, success at achieving this goal must depend on the individual learning of all group members (see Slavin 1983a, b; in press a).

Simply putting students into mixed-ability groups and encouraging them to work together are not enough to produce learning gains: students must have a reason to take one another's achievement seriously, to provide one another with the elaborated explanations that are critical to the achievement effects of cooperative learning (see Webb 1985). If students care about the success of the team, it becomes legitimate for them to ask one another for help and to provide help to each other. Without this team goal, students may feel ashamed to ask peers for help.

Yet team goals are not enough in themselves to enhance student achievement. For example, classroom studies in which students complete a common worksheet or project have not found achievement benefits for such methods. When the group task is to complete a single product, it may be most efficient to let the smartest or highest achieving students do most of the work. Suggestions or questions from lower-achieving students may be ignored or pushed aside, as they may interfere with efficient completion of the group task. We can all recall being in lab groups in science class or in project groups in social studies in which one or two group members did all the work. To enhance the achievement of all students, then, group success must be based not on a single

group product, but on the sum of individual learning performances of all group members.

The group's task in instructionally effective forms of cooperative learning is almost always to prepare group members to succeed on individual assessments. This focuses the group activity on explaining ideas, practicing skills, and assessing all group members to ensure that all will be successful on learning assessments.

When cooperative learning methods provide group goals based on the learning of all members, the effects on student achievement are remarkably consistent. Of 38 studies of at least four weeks' duration comparing cooperative methods of this type to traditional control methods, 33 found significantly greater achievement for the cooperatively taught classes, and 5 found no significant differences (Slavin in press a). In contrast, only 4 of 20 studies that evaluated forms of cooperative learning lacking group goals based on group members' learning found positive achievement effects, and 3 of these are studies by Shlomo Sharan and his colleagues in Israel that incorporated group goals and individual accountability in a different way (see Sharan et al. 1980, Sharan et al. 1984).

Successful studies of cooperative learning have taken place in urban, rural, and suburban schools in the U.S., Canada, Israel, West Germany, and Nigeria, at grade levels from 2 to 12, and in subjects as diverse as mathematics, language arts, writing, reading, social studies, and science. Positive effects have been found on such higher-order objectives as creative writing, reading comprehension, and math problem solving, as well as on such basic skills objectives as language mechanics, math computations, and spelling. In general, achievement effects have been equivalent for high, average, and low achievers, for boys and girls, and for students of various ethnic backgrounds. As noted earlier, positive effects of cooperative learning have also been found on such outcomes as race relations, acceptance of mainstreamed academically handicapped classmates, and student self-

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esteem and liking of class (see Slavin 1983a).

Comprehensive Cooperative Learning Methods

The cooperative learning methods developed in the 1970s—Student Teams-Achievement Divisions and Teams-Games-Tournaments (Slavin 1986); Jigsaw Teaching (Aronson et al. 1978); the Johnsons' methods (Johnson and Johnson 1986); and Group Investigation (Sharan et al., 1984)—all are generic forms of cooperative learning. They can be used at many grade levels and in many subjects. The broad applicability of these methods partly accounts for their popularity. A one- or two-day workshop given to a mixed group of elementary and secondary teachers of many subjects can get teachers off to a good start in most of the methods, which makes this an ideal focus of staff development.

However, because the early cooperative learning methods are generally applicable across grade levels and subjects, they tend not to be uniquely adapted to any particular subject or grade level. Also, the methods developed earlier are mostly curriculum-free; they rarely replace traditional texts or teaching approaches. As a result, these methods are most often applied as supplements to traditional instruction and rarely bring about fundamental change in classroom practice.

Since 1980, research and development on cooperative learning conducted at Johns Hopkins University has begun to focus on comprehensive cooperative learning methods designed to replace traditional instruction *entirely* in particular subjects and at particular grade levels. Two major programs of this type have been developed and successfully researched: Team Accelerated Instruction (TAI) in mathematics for grades 3-6, and Cooperative Integrated Reading and Composition (CIRC) in reading, writing, and language arts for grades 3-5. The main elements of these programs are described below.

Team Accelerated Instruction (TAI). Team Accelerated Instruction shares with STAD and the other Student Team Learning methods the use of four-member mixed-ability learning teams and certificates for high-performing teams. But where STAD uses a single pace of instruction for the class, TAI combines cooperative learning with individualized instruction. TAI is designed to teach mathematics to students in grades 3-6 (or older students not ready for a full algebra course).

In TAI, students enter an individualized sequence according to a placement test and then proceed at their own rates. In general, team members work on different units. Teammates check each other's work against answer sheets and help one another with any problems. Final unit tests are taken without teammate help and are scored by student monitors. Each week, teachers total the number of units completed by all team members and give certificates or other rewards to teams that exceed a criterion score based on the number of final tests passed, with extra points for perfect papers and completed homework.

Because students are responsible for checking each other's work and managing the flow of materials, the teacher can spend most class time presenting lessons to small groups of students drawn from the various teams who are working at the same point in the mathematics sequence. For example, the teacher might call up a decimals group, present a lesson, and then send the students back to their teams

to work on decimal problems. Then the teacher might call the fractions group, and so on.

In TAI, students encourage and help one another to succeed because they want their teams to succeed. Individual accountability is assured because the only score that counts is the final test score, and students take final tests without teammate help. Students have equal opportunities for success because all have been placed according to their level of prior knowledge; it is as easy (or difficult) for a low achiever to complete three subtraction units in a week as it is for a higher-achieving classmate to complete three long division units.

However, the individualization that is part of TAI makes it quite different from STAD. In mathematics, most concepts build on earlier ones. If the earlier concepts were not mastered, the later ones will be difficult or impossible to learn—a student who cannot subtract or multiply will fail to master long division, a student who does not understand fractional concepts will fail to understand what a decimal is, and so on. In TAI, students work at their own levels, so if they lack prerequisite skills they can build a strong foundation before going on. Also, if students can learn more rapidly, they need not wait for the rest of the class.

Individualized mathematics instruction has generally failed to increase student mathematics achievement in the past (see Horak 1981), probably because the teacher's time in earlier models was entirely taken up with checking work and managing materials, leaving little time for actually teaching students. In TAI, students handle the routine checking and management, so the teacher can spend most class time teaching. This difference, plus the motivation and help provided by students within their cooperative teams, probably accounts for the strong positive effects of TAI on student achievement.

Five of six studies found substantially greater learning of mathematics computations in TAI than in control classes, while one study found no differences (Slavin, Leavey, and Madden

A Visit to a Cooperative School

It is Friday morning at "Cooper Elementary School." In Ms. Thompson's third-grade, the students are getting ready for reading. They are sitting in teams at small tables, four or five at each table. As the period begins, Ms. Thompson calls up the "Rockets". Pairs of students from several of the small groups move to a reading group area, while the remaining students continue working at their desks. In Ms. Thompson's class the students at their desks are working together on activities quite different from the usual workbooks. They are taking turns reading aloud to each other; working together to identify the characters, settings, problems, and problem solutions in stories; practicing vocabulary and spelling; and summarizing stories to one another. When Ms. Thompson finishes with the Rockets, they return to their groups and begin working together on the same types of activities. Ms. Thompson listens in on some of the students who are reading to each other and praises teams that are working well. Then she calls up the "Astrors," who leave their teams to go to the reading group.

Meanwhile, in Mr. Fisher's fifth-grade, it is math period. Again, students are working in small teams, but in math, each team member is working on different materials depending on his or her performance level. In the teams students are checking one another's work against answer sheets, explaining problems to one another, and answering each other's questions. Mr. Fisher calls up the "Decimals" group for a lesson. Students working on decimals leave their teams and move to the group area for their lesson. When the lesson is over, the students return to their teams and continue working on decimals.

In Mr. Fisher's class there are five learning disabled students, who are distributed among the various teams. The special education resource teacher, Ms. Walters, is teaming with Mr. Fisher. While he is giving lessons, she is moving through the class helping students. At other times, Ms. Walters gives math lessons to groups of students who are having difficulties in math, including her five LD students, while Mr. Fisher works with students in their team areas.

In Mr. Green's fourth-grade class it is writing time. Mr. Green starts the period with a brief lesson on "and disease," the tendency to write long sentences connected by too many "ands." Then the students work on compositions in teams. They cooperatively plan what they will write and then do a draft. The students read their drafts to their teammates and receive feedback on what their teammates heard, what they liked, and what they wanted to hear more about. After revising their drafts, students hold editing conferences with teammates focusing on the mechanics of the composition.

While the students are writing, Mr. Green is moving from team to team, listening in on what they are saying to each other and conferencing with individual students to help them. Also in the class is Ms. Hill, another fourth-grade teacher. She and Mr. Green began using writing process methods at the same time and are coaching each other as they use them in their classes. At the end of the day the two teachers will meet to discuss what happened, and to plan the next steps jointly. On other days, a substitute will cover Mr. Green's class while he visits Ms. Hill's writing class.

All over Cooper Elementary School, students are working in cooperative teams, and teachers are working together cooperatively to help students learn. In the first grades, students are working in pairs taking turns reading to each other. In the sixth grades students are doing team science projects in which each team member is responsible for a part of the team's task. Second-graders are working in teams to master capitalization and punctuation rules.

At the end of the day, teachers award certificates to teams that did outstanding work that week. Those teams that met the highest standards of excellence receive "Superteam" certificates. Throughout the school the sounds of applause can be heard.

After the students have gone home, the school steering committee meets. Chaired by the principal, the committee includes representatives of teachers at several grade levels, plus two parent representatives. The committee discusses the progress they are making toward their goal of becoming a cooperative school. Among other things, the committee decides to hold a school fair to show what the school is doing, to display the students' terrific cooperative work in writing, science, and math; and to encourage parents to volunteer at the school and to support their children's success at home.

—Robert E. Slavin

1984; Slavin, Madden, and Leavey 1984; Slavin and Karweit 1985). Across all six studies, the TAI classes gained an average of twice as many grade equivalents on standardized measures of computation as traditionally taught control classes (Slavin in press b). For example, in one 18-week study in Wilmington, Delaware, the control group gained .6 grade equivalents in mathematics computations, while the TAI classes gained 1.7 grade equivalents (Slavin and Karweit 1985). These experimental-control differences were still substantial (though smaller) a year after the students were in TAI.

Cooperative Integrated Reading and Composition (CIRC). The newest of the Student Team Learning methods is a comprehensive program for teaching reading and writing in the upper elementary grades. In CIRC, teachers use basal readers and reading groups, much as in traditional reading programs. However, students are assigned to teams composed of pairs from two different reading groups. While the teacher is working with one reading group, students in the other groups are working in their pairs on a series of cognitively engaging activities, including reading to one another; making predictions about how narrative stories will come out; summarizing stories to one another; writing responses to stories; and practicing spelling, decoding, and vocabulary. Students also work in teams to master main idea and other comprehension skills. During language arts periods, a structured program based on a writing process model is used. Students plan and write drafts, revise and edit one another's work, and prepare for publication of team books. Lessons on writing skills such as description, organization, use of vivid modifiers, and on language mechanics skills are fully integrated into students' creative writing.

In most CIRC activities, students follow a sequence of teacher instruction, team practice, team pre-assessments, and a quiz. That is, students do not take the quiz until their teammates have determined they are ready. Certificates are given to teams based on the average performance of all team



Cooperative learning takes place in reading groups when students practice vocabulary words or summarize stories to one another.

members on all reading and writing activities. Two studies of CIRC (Stevens et al. in press) found substantial positive effects from this method on standardized tests of reading comprehension, reading vocabulary, language expression, language mechanics, and spelling, in comparison to control groups. The CIRC classes gained 30 to 70 percent of a grade equivalent more than control classes on these measures in both studies. Significantly greater achievement on writing samples favoring the CIRC students was also found in both studies.

A New Possibility

The development and successful evaluation of the comprehensive TAI and CIRC models has created an exciting new possibility. With cooperative learning programs capable of being used all year in the 3 Rs, it is now possible to design an elementary school program based upon a radical principle: students, teachers, and administrators can work *cooperatively* to make the school a better place for working and learning.

There are many visions of what a cooperative elementary school might look like, but there is one model that my colleagues and I have begun to work toward in partnership with some innovative practitioners. Its major components are as follows.

1. *Cooperative learning in the classroom*. Clearly, a cooperative elementary school would have cooperative learning methods in use in most classrooms and in more than one subject. Students and teachers should feel that the idea that students can help one another learn is not just applied on

occasion, but is a fundamental principle of classroom organization. Students should see one another as resources for learning, and there should be a schoolwide norm that every student's learning is everyone's responsibility, that every student's success is everyone's success.

2. *Integration of special education and remedial services with the regular program*. In the cooperative elementary school, mainstreaming should be an essential element of school and classroom organization. Special education teachers may team-teach with regular teachers, integrating their students in teams with nonhandicapped students and contributing their expertise in adapting instruction to individual needs to the class as a whole. Similarly, Chapter I or other remedial services should be provided in the regular classroom. If we take seriously the idea that all students are responsible for one another, this goes as much for students with learning problems as for anyone else. Research on use of TAI and CIRC to facilitate mainstreaming and meet the needs of remedial readers has found positive effects on the achievement and social acceptance of these students (see Slavin 1984, Slavin et al. in press).

3. *Peer coaching*. In the cooperative elementary school, teachers should be responsible for helping one another to use cooperative learning methods successfully and to implement other improvements in instructional practice. Peer coaching (Joyce et al. 1983) is perfectly adapted to the philosophy of the cooperative school; teachers learn new methods together

and are given release time to visit one another's classes to give assistance and exchange ideas as they begin using the new programs.

4. *Cooperative planning.* Cooperative activities among teachers should not be restricted to peer coaching. In addition, teachers should be given time to plan goals and strategies together, to prepare common libraries of instructional materials, and to make decisions about cooperative activities involving more than one class.

5. *Building-level steering committee.* In the cooperative elementary school, teachers and administrators should work together to determine the direction the school takes. A steering committee composed of the principal, classroom teacher representatives, representatives of other staff (e.g., special education, Chapter 1, aides), and one or more parent representatives meets to discuss the progress the school is making toward its instructional goals and to recommend changes in school policies and practices to achieve these goals.

6. *Cooperation with parents and community members.* The cooperative school should invite the participation of parents and community members. Development of a community sense that children's success in school is everyone's responsibility is an important goal of the cooperative school.

The Cooperative School Today

To my knowledge, there is not yet a school that is implementing all of the program elements listed here, but a few enterprising and committed schools are moving in this direction. In Bay Shore (New York) School District, teachers in two intermediate schools are using CIRC in reading, writing, and language arts, and STAD in math. In Alexandria, Virginia, Mt. Vernon Community School is working with the National Education Association's Mastery in Learning project to build a cooperative school plan. At Mt. Vernon, a building steering committee is planning and helping to implement a gradual phasing in of the TAI math program and CIRC reading, writing, and language arts programs. Several

schools throughout the U.S. that have successfully implemented TAI math are now planning to add CIRC for reading and writing instruction, and are looking toward full-scale implementation of a cooperative school plan. Most schools that have focused school renewal efforts on widespread use of cooperative learning are at the elementary level; but several middle, junior high, and high schools have begun to work in this direction as well.

In a time of limited resources for education, we must learn to make the best use of what we have. Cooperative learning and the cooperative school provide one means of helping students, teachers, and administrators work together to make meaningful improvements in the learning of all students. □

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