What makes **groupwork work?**

Co-operative Learning can be a great way for pupils to acquire social skills as well as knowledge – as long as it's done right. Its leading theorist, educational psychologist **Robert E Slavin,** explores the pitfalls and the possibilites

There was once a time when it was taken for granted that a quiet class was a learning class, when headteachers walked down the hall expecting to be able to hear a pin drop. In more recent times, however, teachers are more likely to encourage students to interact with each other in co-operative learning groups. Having students work in groups can be enormously beneficial or it can be of little value. How can teachers make best use of this powerful tool?

Co-operative learning has been suggested as the solution for an astonishing array of educational problems. It is often cited as a means of emphasising thinking skills and increasing higher-order learning; as an alternative to setting, remediation, or special education; as a means of improving race relations; and as a way to prepare students for an increasingly collaborative workplace. How many of these claims are justified? What effects do the various collaborative learning methods have on student achievement and other outcomes? Which forms of co-operative learning are most effective, and what components must be in place for co-

operative learning to work? To answer these questions, this article reviews studies of co-operative learning in primary and secondary schools (for a more extensive review see Slavin 1995, 2009).

There are many quite different forms of co-operative learning, but all of them involve having students work in small groups or teams to help one another learn academic material. Co-operative learning usually supplements the teacher's instruction by giving students an opportunity to discuss information or practise skills originally presented by the teacher. Sometimes co-operative methods require students to find or discover information on their own. Co-operative learning has been used and investigated in every imaginable subject at all year levels.

Student team learning (STL) techniques were developed and researched at Johns Hopkins University in the US. More than half of all experimental studies of practical co-operative learning methods involve STL methods.

All co-operative learning methods share the idea that students work together to learn and are responsible for one another's learning as well as their own. STL methods also emphasise the use of team goals and team success, which can only be achieved if all members of the team learn the objectives being taught. That is, in student team learning the students' tasks are not to do something as a team but to learn something as a team.

Three concepts are central to all student team learning methods: team rewards, individual accountability, and equal opportunities for success. Using STL techniques, teams earn certificates or other team rewards if they achieve above a designated criterion. Individual accountability means that the team's success depends on the individual learning of all team members. This focuses the activity of the team members on explaining concepts to one another and making sure that everyone on the team is ready for a quiz or other assessment which they will take without teammates' help. Equal opportunities for success means that students contribute to their teams by improving over their past performances. This ensures that high, average, and low achievers are equally challenged to do their best and that the contributions of all team members will be valued.

The findings of these experimental studies indicate that team rewards and individual accountability are essential elements for enhancing basic skills (Slavin 1995, 2009). It is not enough to simply tell students to work together. They must have a reason to take one another's achievement seriously. Further, if students are rewarded for doing better than they have in the past, they will be more motivated to achieve than if they are rewarded based on their performance in comparison to others, because rewards for improvement make success neither too difficult nor too easy for students to achieve.

The Johns Hopkins team developed and researched four principal learning methods. Two are general co-operative learning methods adaptable to most subjects and age groups: *student teams-achievement divisions* (STAD) and *teams-games-tournament* (TGT). The remaining two are comprehensive curriculums designed for use in particular subjects with particular age groups: *team-assisted individualisation* (TAI) for mathematics in Years 3 to 6 and *co-operative integrated reading and composition* (CIRC) for reading and writing instruction in Years 3 to 5.

Student teams-achievement divisions (STAD)

In STAD (Slavin 1994), students are assigned to four-member learning teams mixed in performance level, gender and ethnicity. The teacher presents a lesson, and the students work within their teams to make sure that all team members have mastered the lesson. Finally, all students take individual quizzes on the material, at which time they may not help one another.

Students' quiz scores are compared to their past averages, and points are awarded based on the degree to which students can meet or exceed their earlier performances. These points are then added up to form team scores, and teams that meet certain criteria earn certificates or other rewards. The whole cycle of activities, from teacher presentation to team practice to quiz, usually takes three to five class periods.

STAD had been used in a wide variety of subjects, from mathematics to language, arts and social studies, and a wide age range. The method is most appropriate for teaching well-defined objectives with simple right answers, such as mathematical computations and applications, language usage and mechanics, geography and map skills, and science facts and concepts.

Teams-games-tournament (TGT)

Teams-games-tournament (Slavin 1994) uses the same teacher presentations and teamwork as STAD but replaces the quizzes with weekly tournaments. In these, students compete with members of other teams to contribute points to their team score. Students compete at three-person 'tournament tables' against others with a similar past record in mathematics. A procedure changes table assignments to keep the competition fair. The winner at each tournament table brings the same number of points to their team, regardless of which table it is; this means that low achievers (competing with other low achievers) and high achievers (competing with

other high achievers) have equal opportunity for success. As in STAD, high-performing teams earn certificates or other forms of team rewards. TGT is appropriate for the same types of objectives as STAD.

Team-assisted individualisation (TAI)
Team-assisted individualisation (Slavin *et al* 1986) shares with STAD and TGT the use of the four-member mixed-ability learning teams and certificates for high-performing teams. But where STAD and TGT use a single pace of instruction for the class, TAI combines co-operative learning with individualised instruction. Also, where STAD and TGT apply to most subjects at higher levels, TAI is specifically designed to teach mathematics to younger students (or older students not ready for a full algebra course).

In TAI, students enter an individualised sequence according to a placement test and then proceed at their own rates. In general, team members work on different units. Teammates check each others' work against answer sheets and help one another with any problems. Final unit tests are taken without teammates' 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 team 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 take responsibility for checking each other's work and managing the flow of materials, the teacher can spend most of the 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 problems. Then the teacher might call the fractions group, and so on.

Co-operative integrated reading and composition (CIRC)
CIRC is a comprehensive programme for teaching reading and writing to older primary school pupils (Stevens *et al* 1987). Teachers use reading texts and reading groups, much as in traditional reading programmes. However, all students are assigned to teams composed of two pairs from two different reading groups. While the teacher is working with one reading group, the paired students in the other groups are working on a series of cognitively engaging activities, including reading to one another, making predictions about how narrative stories will come out, summarising stories to one another, writing responses to stores, and practising spelling, decoding, and vocabulary. Students work as a total team to master 'main idea' and other comprehension skills. During language arts periods, students engage in writing drafts, revising and editing one another's work, and preparing for 'publications' of team books.

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

Jigsaw
Jigsaw was originally designed by Elliot Aronson and his colleagues (1978). Students are assigned to six-member teams to work on academic material that has been broken down into sections. For example, a biography might be divided into early life, first accomplishments, major setbacks, later life, and impact on history. Each team member reads their section. Next, members of different teams who have studied the same sections meet in 'expert groups' to discuss their sections. Then the students return to their teams and take turns teaching their teammates about their sections.

Since the only way students can learn sections other than their own is to listen carefully to their teammates, they are motivated to support and show interest in one another's work.

I developed a modification of Jigsaw (Slavin 1994) at Johns Hopkins University and then incorporated it in the Student Team Learning programme. In this method, called Jigsaw II, students work in four-or five-member team as in TGT and STAD. Instead of each student being assigned a particular section of text, all students read a common narrative, such as a book chapter, a short story, or a biography. However, each student receives a topic (such as 'climate' in a unit on France) on which to become an expert. Students with the same topics meet in expert groups to discuss them, after which they return to their teams to teach what they have learned to their teammates. Then students take individual quizzes, which result in team scores based on the improvement score system of STAD. Teams that meet predetermined standards earn certificates. Jigsaw is primarily used in social studies and other subjects where learning from text is important.

Learning Together
David Johnson and Roger Johnson at the University of Minnesota developed the Learning Together models of co-operative learning (Johnson and Johnson 1999). The methods they have researched involve students working on

assignment sheets in four- or five-member heterogeneous groups. The groups hand in a single sheet and receive praise and rewards based on the group product. Their methods emphasise team-building activities before students begin working together and regular discussions within groups about how well they are working together.

Group Investigation

Group Investigation, developed by Shlomo Sharan and Yael Sharan at the University of Tel Aviv, is a general classroom organisation plan in which students work in small groups using co-operative inquiry, group discussion, and co-operative planning and projects (Sharan and Sharan 1976). In this method, students form their own two- to six-member groups. After choosing sub-topics from a unit being studied by the entire class, the groups further break their sub-topics into individual tasks and carry out the activities necessary to prepare group reports. Each group then makes a presentation or display to communicate its findings to the entire class.

Goals and accountability

Co-operative learning methods are among the most extensively evaluated alternatives to traditional instruction in used today. What the research finds is that use of co-operative learning almost always improves affective outcomes. Students love to work in groups and they feel more successful and like subjects taught co-operatively. They have more friends of different ethnic groups and are more accepting of others different from themselves.

The students' eventual levels of attainment, however, depend a great deal on how co-operative learning is used. Two elements must be present if co-operative learning is to be effective: *group goals* and *individual accountability* (Slavin 1995, 2009). That is, groups must be working to achieve some goal or to earn rewards or recognition, and the success of the group must depend on the individual learning of every group member.

Why are group goals and individual accountability so important? To understand this, consider the alternatives. In some forms of co-operative learning, students work together to complete a single worksheet or to solve one problem together. In such methods, there is little reason for more able students to take time to explain what is going on to their less able groupmates or to ask their opinions. When the group task is to do something, rather than to learn something, the participation of less able students may be seen as interference rather than help. It may be easier in this circumstance for students to give each other answers than to explain concepts or skills to one another.

In contrast, when the group's task is to ensure that every group member learns something, it is in the interests of every group member to spend time explaining concepts to their groupmates. Studies of student behaviour within co-operative groups have consistently found that the students who gain most from co-operative work are those who give and receive elaborated explanations (Webb 1985). In contrast, giving and receiving answers without explanations was negatively related to achievement gain. What group goals and individual accountability do is to motivate students to give explanations and to take one another's learning seriously, instead of simply giving answers.

Co-operative learning methods generally work equally well for all types of student; while occasional studies find particular advantages for high or low achievers, boys or girls, and so on, the great majority find equal benefits for all types of students. Sometimes teachers or parents worry that co-operative learning will hold back high achievers. The research provides absolutely no support for this claim; high achievers gain from co-operative learning (relative to high achievers in traditional classes) just as much as do low and average achievers.

Research has shown the usefulness of co-operative learning strategies for improving such diverse outcomes as student learning at a variety of year levels and in many subjects, intergroup relations, and student self-esteem. Further, their widespread use demonstrates that co-operative learning methods are practical and attractive to teachers. The history of the development, evaluation, and dissemination of co-operative learning is an outstanding example of the use of educational research to create programmes that have improved the educational experience of thousands of students and will continue to affect thousands more.

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