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Making Cooperative Learning Work

SANDY KOUFAX WAS ONE OF THE GREATEST pitchers in the history of baseball. Although he was naturally talented, he was also unusually well trained and disciplined. He was perhaps the only major-league pitcher whose fastball could be heard to hum. Opposing batters, instead of talking and joking around in the dugout, would sit quietly and listen for Koufax's fastball to hum. When it was their turn to bat, they were already intimidated.

There was, however, a simple way for Koufax's genius to have been negated: by making the first author of this article his catcher. To be great, a pitcher needs an outstanding catcher (his great partner was Johnny Roseboro). David is such an unskilled catcher that Koufax would have had to throw the ball much slower in order for David to catch it. This would have deprived Koufax of his greatest weapon.

Placing Roger at key defensive positions in the infield or outfield, furthermore, would have seriously affected Koufax's success. Sandy Koufax was not a great pitcher on his own. Only as part of a team could Koufax achieve greatness. In baseball and in the classroom, it takes a cooperative effort. Extraordinary achievement comes from a cooperative group, not from the individualistic or competitive efforts of an isolated individual.

David W. Johnson and Roger T. Johnson are professors of education and codirectors of the Cooperative Learning Center at the University of Minnesota.

In 1966 David began training teachers at the University of Minnesota in how to use small groups for instructional purposes. In 1969 Roger joined David at Minnesota, and the training of teachers in how to use cooperative learning groups was extended into teaching methods courses in science education. The formation of the Cooperative Learning Center soon followed to focus on five areas:

1. Summarizing and extending the theory on cooperation and competition.
2. Reviewing the existing research in order to validate or disconfirm the theory and establish what is known and unknown.
3. Conducting a long-term program of research to validate and extend the theory and to identify (a) the conditions under which cooperative, competitive, and individualistic efforts are effective and (b) the basic elements that make cooperation work.
4. Operationalizing the validated theory into a set of procedures for teachers and administrators to use.
5. Implementing the procedures in classes, schools, school districts, colleges, and training programs.

These five activities result in an understanding of what is and is not a cooperative effort, the different types of cooperative learning, the five basic elements that make cooperation work, and the outcomes that result when cooperation is carefully structured.

What Is and Is Not a Cooperative Effort

Not all groups are cooperative. There is nothing magical about working in a group. Some kinds of learning groups facilitate student learning and increase the quality of life in the classroom. Other types of learning groups hinder student learning and create disharmony and dissatisfaction. To use cooperative learning effectively, one must know what is and is not a cooperative group (Johnson, Johnson, & Holubec, 1998b).

1. *Pseudo learning group*: Students are assigned to work together but they have no interest in doing so and believe they will be evaluated by being ranked from the highest to the lowest performer. Students hide information from each other, attempt to mislead and confuse each other, and distrust each other. The result is that the sum of the whole is less than the potential of the individual members. Students would achieve more if they were working alone.

2. *Traditional classroom learning group*: Students are assigned to work together and accept that they have to do so. Assignments are structured so that students are evaluated and rewarded as individuals, not as members of the group. They seek each other's information but have no motivation to teach what they know to group-mates. Some students seek a free ride on the efforts of group-mates, who feel exploited and do less. The result is that the sum of the whole is more than the potential of some of the members, but the more hard working and conscientious students would perform higher if they worked alone.

3. *Cooperative learning group*: Students work together to accomplish shared goals. Students seek outcomes that are beneficial to all. Students discuss material with each other, help one another understand it, and encourage each other to work hard. Individual performance is checked regularly to ensure that all students are contributing and learning. The result is that the group is more than a sum of its parts, and all students perform higher academically than they would if they worked alone.

4. *High-performance cooperative learning group*: This is a group that meets all the criteria for being a cooperative learning group and outperforms all reasonable expectations, given its membership. The level of commitment members have to each other and the group's success is beyond

that of most cooperative groups. Few groups ever achieve this level of development.

How well any small group performs depends on how it is structured. Seating people together and calling them a cooperative group does not make them one. Study groups, project groups, lab groups, homerooms, and reading groups are groups, but they are not necessarily cooperative. Even with the best of intentions, teachers may be using traditional classroom learning groups rather than cooperative learning groups. To ensure that a group is cooperative, educators must understand the different ways cooperative learning may be used and the basic elements that need to be carefully structured within every cooperative activity.

Types of Cooperative Learning

Two are better than one, because they have a good reward for toil. For if they fall, one will lift up his fellow; but woe to him who is alone when he falls and has not another to lift him up. . . . And though a man might prevail against one who is alone, two will withstand him. A threefold cord is not quickly broken. (Ecclesiastics 4:9-12)

Cooperative learning is a versatile procedure and can be used for a variety of purposes. Cooperative learning groups may be used to teach specific content (formal cooperative learning groups), to ensure active cognitive processing of information during a lecture or demonstration (informal cooperative learning groups), and to provide long-term support and assistance for academic progress (cooperative base groups) (Johnson, Johnson, & Holubec, 1998a, 1998b).

Formal cooperative learning consists of students working together, for one class period or several weeks, to achieve shared learning goals and complete specific tasks and assignments (e.g., problem solving, writing a report, conducting a survey or experiment, learning vocabulary, or answering questions at the end of the chapter) (Johnson, Johnson, & Holubec, 1998b). Any course requirement or assignment may be structured cooperatively. In formal cooperative learning groups, teachers:

1. Make a number of *preinstructional decisions*. Teachers specify the objectives for the lesson (both academic and social skills) and decide on the size of groups, the method of assigning students to groups, the roles students will be assigned,

the materials needed to conduct the lesson, and the way the room will be arranged.

2. *Explain* the task and the positive interdependence. A teacher clearly defines the assignment, teaches the required concepts and strategies, specifies the positive interdependence and individual accountability, gives the criteria for success, and explains the social skills to be used.

3. *Monitor* students' learning and *intervene* within the groups to provide task assistance or to increase students' interpersonal and group skills. A teacher systematically observes and collects data on each group as it works. When needed, the teacher intervenes to assist students in completing the task accurately and in working together effectively.

4. *Assess* students' learning and help students process how well their groups functioned. Students' learning is carefully assessed and their performances evaluated. Members of the learning groups then discuss how effectively they worked together and how they can improve in the future.

Informal cooperative learning consists of having students work together to achieve a joint learning goal in temporary, ad-hoc groups that last from a few minutes to one class period (Johnson, Johnson, & Holubec, 1998a; Johnson, Johnson, & Smith, 1998). During a lecture, demonstration, or film, informal cooperative learning can be used to (a) focus student attention on the material to be learned, (b) set a mood conducive to learning, (c) help set expectations as to what will be covered in a class session, (d) ensure that students cognitively process the material being taught, and (e) provide closure to an instructional session.

During direct teaching the instructional challenge for the teacher is to ensure that students do the intellectual work of organizing material, explaining it, summarizing it, and integrating it into existing conceptual structures. Informal cooperative learning groups are often organized so that students engage in 3-5 minute focused discussions before and after a lecture and 2-3 minute turn-to-your-partner discussions interspersed throughout a lecture.

Cooperative base groups are long-term, heterogeneous cooperative learning groups of 3-4 members with stable membership (Johnson, Johnson, & Holubec, 1998a; Johnson, Johnson, & Smith, 1998). Base groups give the support, help,

encouragement, and assistance each member needs to make academic progress (attend class, complete all assignments, learn) and develop cognitively and socially in healthy ways. Base groups meet daily in elementary school and twice a week in secondary school (or whenever the class meets). They are permanent (lasting from one to several years) and provide the long-term caring peer relationships necessary to influence members consistently to work hard in school.

The use of base groups tends to improve attendance, personalize the work required and the school experience, and improve the quality and quantity of learning. School and classroom management is enhanced when base groups are given the responsibility for conducting a year-long service project to improve the school. The larger the class or school and the more complex and difficult the subject matter, the more important it is to have base groups. Base groups are also helpful in structuring homerooms and when a teacher meets with a number of advisees.

Example of Integrated Use of Cooperative Learning

An example of the integrated use of the cooperative learning procedures is as follows. Students arrive at class and meet in their base groups to welcome each other, check each student's homework to make sure all members understand the academic material and are prepared for the class session, and tell each other to have a great day.

The teacher then begins a lesson on the limitations of being human (Billion-Dollar Being, 1974). To help students cognitively organize in advance what they know about the advantages and disadvantages of being human, the teacher uses informal cooperative learning. The teacher asks students to form a triad and ponder, "What are five things you cannot do with your human limitations that a billion-dollar being might be designed to do?" Students have 4 minutes to do so. In the next 10 minutes, the teacher explains that while the human body is a marvelous system, we (like other organisms) have very specific limitations. We cannot see bacteria in a drop of water or the rings of Saturn unaided. We cannot hear as well as a deer or fly like an eagle. Humans have never been satisfied being so limited and, therefore, we have invented

microscopes, telescopes, and our own wings. The teacher then instructs students to turn to the person next to them and answer the questions, "What are three limitations of humans, what have we invented to overcome them, and what other human limitations might we be able to overcome?"

Formal cooperative learning is now used in the lesson. The teacher has the 32 students count off from 1 to 8 to form groups of four randomly. Group members sit in a semicircle so they can face each other and still be facing the teacher. Each member is assigned a role: researcher/runner, summarizer/timekeeper, collector/recorder, and technical adviser (role interdependence). Every group gets one large (2x3-foot) piece of paper, a marking pen, a rough draft sheet for designing the being, an assignment sheet explaining the task and cooperative goal structure, and four student self-evaluation checklists (resource interdependence). The task is to design a billion-dollar being that overcomes the human limitations thought of by the class and the group. The group members are to draw a diagram of the being on the scratch paper and, when they have something they like, transfer it to the larger paper.

The teacher establishes positive goal interdependence by asking for one drawing from the group that all group members contribute to and can explain. The criterion for success is to complete the diagram in the 30-minute time limit. The teacher observes each group to ensure that members are fulfilling their roles and that any one member can explain any part of the being at any time. The teacher informs students that the expected social skills to be used by all students are encouraging each other's participation, contributing ideas, and summarizing. She defines the skill of encouraging participation and has each student practice it twice before the lesson begins.

While students work in their groups, the teacher monitors by systematically observing each group and intervening to provide academic assistance and help in using the interpersonal and small group skills required to work together effectively. At the end of the lesson, the groups hand in their diagrams of the billion-dollar being to be assessed and evaluated. Group members then process how well they worked together by identifying actions each member engaged in that helped the group suc-

ceed and one thing that could be added to improve their group next time.

The teacher uses informal cooperative learning to provide closure to the lesson by asking students to meet in new triads and write out six conclusions about the limitations of human beings and what we have done to overcome them. At the end of the class session, the cooperative base groups meet to review what students believe is the most important thing they have learned during the day, what homework has been assigned, what help each member needs to complete the homework, and to tell each other to have a fun afternoon and evening.

The Cooperative School

Teachers are not the only ones who need to carefully structure cooperation. Administrators need to create a learning community by structuring cooperation at the school level (Johnson & Johnson, 1994, 1999). In addition, they have to attend to the cooperation among faculty, between the school and parents, and between the school and the community.

Administrators, for example, may structure three types of cooperative faculty teams. Collegial teaching teams are formed to increase teachers' instructional expertise and success. They consist of 2-5 teachers who meet weekly and discuss how to better implement cooperative learning within their classrooms. Teachers are assigned to task forces to plan and implement solutions to school-wide issues and problems such as curriculum adoptions and lunchroom behavior. Ad hoc decision-making groups are used during faculty meetings to involve all staff members in important school decisions.

The use of cooperative teams at the building level ensures that there is a congruent cooperative team-based organizational structure within both classrooms and the school. Finally, the superintendent uses the same types of cooperative teams to maximize the productivity of district administrators.

Basic Elements of Cooperation

In order for an activity to be cooperative, five basic elements are essential and need to be included (Johnson & Johnson, 1989; Johnson, Johnson, & Holubec, 1998a). The five essential elements are as follows.

1. *Positive interdependence*: Positive interdependence is the perception that we are linked with

others in a way so that we cannot succeed unless they do. Their work benefits us and our work benefits them. Within every cooperative lesson, positive goal interdependence must be established through mutual learning goals (learn the assigned material and make sure that all members of your group learn the assigned material). In order to strengthen positive interdependence, joint rewards (if all members of your group score 90 percent correct or better on the test, each will receive 5 bonus points), divided resources (giving each group member a part of the total information required to complete an assignment), and complementary roles (reader, checker, encourager, elaborator) may also be used.

2. *Individual accountability*: Individual accountability exists when the performance of each individual student is assessed and the results are given back to the group and the individual. The purpose of cooperative learning groups is to make each member a stronger individual. Students learn together so that they can subsequently perform higher as individuals. To ensure that each member is strengthened, students are held individually accountable to do their share of the work. Common ways to structure individual accountability include (a) giving an individual test to each student, (b) randomly selecting one student's product to represent the entire group, or (c) having each student explain what they have learned to a classmate.

3. *Face-to-face promotive interaction*: Individuals promote each other's success by helping, assisting, supporting, encouraging, and praising each other's efforts to achieve. Certain cognitive activities and interpersonal dynamics only occur when students get involved in promoting each other's learning. These include orally explaining how to solve problems, discussing the nature of the concepts being learned, teaching one's knowledge to classmates, and connecting present with past learning. Accountability to peers, ability to influence each other's reasoning and conclusions, social modeling, social support, and interpersonal rewards all increase as the face-to-face interactions among group members increase.

In addition, the verbal and nonverbal responses of other group members provide important information concerning a student's performance. Silent students are uninvolved students who are

not contributing to the learning of others as well as themselves. To obtain meaningful face-to-face interaction, the size of groups needs to be small (2-4 members).

4. *Social skills*: Contributing to the success of a cooperative effort requires interpersonal and small group skills. Placing socially unskilled individuals in a group and telling them to cooperate does not guarantee that they will be able to do so effectively. Persons must be taught the leadership, decision-making, trust-building, communication, and conflict-management skills just as purposefully and precisely as academic skills. Procedures and strategies for teaching students social skills may be found in Johnson (1997) and Johnson and F. Johnson (1997).

5. *Group processing*: Group processing exists when group members discuss how well they are achieving their goals and maintaining effective working relationships. Groups need to describe what member actions are helpful and unhelpful and make decisions about what behaviors to continue or change. When difficulties in relating to each other arise, students must engage in group processing and identify, define, and solve the problems they are having working together effectively.

Understanding these five basic elements and developing skills in structuring them allows teachers to (a) adapt cooperative learning to their unique circumstances, needs, and students, (b) fine tune their use of cooperative learning, and (c) prevent and solve problems students have in working together.

What Do We Know About Cooperative Efforts?

Everyone has to work together; if we can't get everybody working toward common goals, nothing is going to happen. (Harold K. Sperlich, president, Chrysler Corporation)

A great deal of research has been conducted comparing the relative effects of cooperative, competitive, and individualistic efforts on instructional outcomes. During the past 100 years, over 550 experimental and 100 correlational studies have been conducted by a wide variety of researchers in different decades with different age subjects, in different subject areas, and in different settings (see Johnson & Johnson, 1989, for a complete listing and review of these studies).

The type of interdependence structured among students determines how they interact with each other, which, in turn, largely determines instructional outcomes. Structuring situations cooperatively results in students interacting in ways that promote each other's success, structuring situations competitively results in students interacting in ways that oppose each other's success, and structuring situations individualistically results in no interaction among students. These interaction patterns affect numerous instructional outcomes, which may be subsumed within the three broad and interrelated categories of effort exerted to achieve, quality of relationships among participants, and participants' psychological adjustment and social competence (see Figure 1) (Johnson & Johnson, 1989).

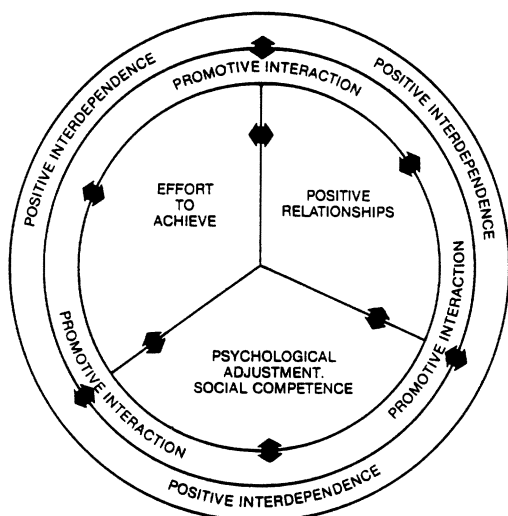


Figure 1. Outcomes of cooperative learning (Johnson & Johnson, 1989).

Achievement

Achievement is a we thing, not a me thing, always the product of many hands and heads. (John Atkinson)

Regarding the question of how successful competitive, individualistic, and cooperative efforts are in promoting productivity and achievement, over 375 studies have been conducted in the past 100 years (Johnson & Johnson, 1989). Working together to achieve a common goal produces higher achieve-

ment and greater productivity than does working alone. This is so well confirmed by so much research that it stands as one of the strongest principles of social and organizational psychology.

Cooperative learning, furthermore, results in process gain (i.e., more higher-level reasoning, more frequent generation of new ideas and solutions), greater transfer of what is learned within one situation to another (i.e., group to individual transfer), and more time on task than does competitive or individualistic learning. The more conceptual the task, the more problem solving required; the more higher-level reasoning and critical thinking, the more creativity required; and the greater the application required of what is being learned to the real world, the greater the superiority of cooperative over competitive and individualistic efforts.

Cooperative learning ensures that all students are meaningfully and actively involved in learning. Active, involved students do not tend to engage in disruptive, off-task behavior. Cooperative learning also ensures that students are achieving up to their potential and are experiencing psychological success, so they are motivated to continue to invest energy and effort in learning. Those who experience academic failure are at risk for tuning out and acting up, which often leads to physical or verbal aggression.

Interpersonal relationships

A faithful friend is a strong defense, and he that hath found him, hath found a treasure. (Ecclesiastics 6:14)

Over 180 studies have been conducted since the 1940s on the relative impact of cooperative, competitive, and individualistic experiences on interpersonal attraction (Johnson & Johnson, 1989). The data indicate that cooperative experiences promote greater interpersonal attraction than do competitive or individualistic ones. Cooperative learning promotes the development of caring and committed relationships for every student. Even when individuals initially dislike each other or are obviously different from each other, cooperative experiences have been found to promote greater liking than is found in competitive and individualistic situations.

Cooperative groups help students establish and maintain friendships with peers. As relationships

become more positive, there are corresponding improvements in productivity, morale, feelings of personal commitment and responsibility to do the assigned work, willingness to take on and persist in completing difficult tasks, and commitment to peers' success and growth. Absenteeism and turnover of membership decreases. Students who are isolated or alienated from their peers and who do not have friends are more likely to be at risk for violent and destructive behavior than students who experience social support and a sense of belonging.

Psychological health and social competence

Working cooperatively with peers, and valuing cooperation, results in greater psychological health, higher self-esteem, and greater social competencies than does competing with peers or working independently. When individuals work together to complete assignments, they interact (improving social skills and competencies), promote each other's success (gaining self-worth), and form personal as well as professional relationships (creating the basis for healthy social development).

Cooperative efforts with caring people tend to increase personal ego-strength, self-confidence, independence, and autonomy. They provide the opportunity to share and solve personal problems, which increases an individual's resilience and ability to cope with adversity and stress. The more individuals work cooperatively, the more they see themselves as worthwhile and as having value and the more autonomous and independent they tend to be.

Cooperative groups provide an arena in which individuals develop the interpersonal and small group skills needed to work effectively with diverse schoolmates. Students learn how to communicate effectively, provide leadership, help the group make good decisions, build trust, repair hurt feelings, and understand other's perspectives. Even kindergartners can practice social skills each day in cooperative activities. Cooperative experiences are not a luxury. They are a necessity for the healthy social and psychological development of individuals who can function independently.

Conclusion

Cooperative learning is the instructional use of small groups in which students work together to

maximize their own and each other's learning. Cooperative learning may be differentiated from pseudo groups and traditional classroom learning groups. There are three types of cooperative learning: formal cooperative learning, informal cooperative learning, and cooperative base groups. The basic elements that make cooperation work are positive interdependence, individual accountability, promotive interaction, appropriate use of social skills, and periodic processing of how to improve the effectiveness of the group.

When efforts are structured cooperatively, there is considerable evidence that students will exert more effort to achieve (learn more, use higher-level reasoning strategies more frequently, build more complete and complex conceptual structures, and retain information learned more accurately), build more positive and supportive relationships (including relationships with diverse individuals), and develop in more healthy ways (psychological health, self-esteem, ability to manage stress and adversity).

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