Cooperative learning: Benefits, drawbacks, and viability

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Abstract
In this review, existing evidence as to the potential benefits of cooperative learning for instruction were explored. A definition of cooperative learning was generated as well as an effective method of implementation. Experts, teachers, parents, and students were utilized as sources for analyzing the benefits and drawbacks to using cooperative learning in schools. The results of the review indicate that cooperative learning is an effective and viable method of instruction today, which should continue to be used in the future.
COOPERATIVE LEARNING:

BENEFITS, DRAWBACKS, AND VIABILITY

A Graduate Review
Submitted to the
Division of Elementary Education
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INTRODUCTION

Educators today are continuing to challenge themselves to develop and administer new and effective ways to increase students' skills. Thus, this review is important to all educators from traditional school environments who wish to bring about changes in their teaching. The general purpose of this review is to investigate the existing evidence as to the potential benefits of cooperative learning for instruction. What is cooperative learning? Is there a best way to implement cooperative learning? What do experts in the field, teachers, parents, and students have to say about this growing trend in education? What are the drawbacks of utilizing cooperative learning in schools? Will the evidence from this review support the concept that cooperative learning is an excellent method for teaching and learning in many curriculum areas? The results of this review might provide a practical alternative to the traditional teaching methods used in schools today.

Definition

Cooperative learning is a method where students in small groups are rewarded when all of the members of the group accomplish something. The small group usually consists of two to six students who work together to achieve a common goal. The group is then confronted with a situation that challenges everyone. Thus, all the students must work together to solve the problem cooperatively (Taylor, 1989).

When cooperative learning is used properly, it
complements and supplements traditional instruction and the other learning/teaching methods found in typical schools. Its main goal is to replace much of the competitive and individual seatwork that is seen in many schools today. Advocates of cooperative learning say that there is a foundation for all types of learning, but that cooperative learning must be used considerably more in classrooms than what we presently see in schools today (Ellis & Fouts, 1993).

**Methodology**

Many of the sources for this literature review were identified and located by utilizing an ERIC search at the Donald O. Rod Library at the University of Northern Iowa. Key words were used to narrow my search. These included: cooperative learning, grouping, elementary education, and mathematics. Other sources were obtained from the bibliographies of articles found in current professional journals. The sources were then analyzed and sorted into general categories. These categories included: benefits, drawbacks, experts, teachers, parents, and students. Finally, much of the information obtained for this review is supported by recognized experts in the field of cooperative learning.
LITERATURE REVIEW

"Cooperative learning is generally understood to be learning that takes place in an environment where students in small groups share ideas and work collaboratively to complete academic tasks" (Davidson & Kroll, 1991, p. 362). It takes considerable training and motivation to successfully implement cooperative learning. Researchers will be utilized to analyze the implementation, benefits, and drawbacks of cooperative learning. In addition, teachers, parents, and students will give their perspectives on the growing trend of cooperative learning. This literature review will help define the future of cooperative learning as an effective method of teaching.

Implementation

According to Roger and David Johnson (1987) there are five basic elements that are needed in the classroom for cooperative learning to be an effective method of instruction. The first element is called "positive interdependence." The students have to care about each other's learning and believe they will swim or sink together.

The second element is the use of continuous verbal face-to-face interaction among students. They need to explain, elaborate, argue, and tie all the presented material together.

Individual accountability is the third element. It is important that every student is pulling her or his own
weight. It should be clear that every student in the group has to learn.

Social skills is the fourth element. Students need to be taught communication, appropriate leadership, conflict resolution skills, and trust building, so they can effectively operate in a group setting.

The final element is what is called "group processing". Every now and then the students need to assess how well they are working together and how they can improve.

According to David Johnson, if a district builds the structure of these five elements, positive things happen throughout the system. Not only does cooperative learning increase in the classrooms, but also teacher morale goes up. The teachers are more likely to build support groups in their buildings and also develop better relationships with their administrators. Students and teachers are more committed towards their jobs and have the energy to help the whole district function better. Finally, it helps keep absenteeism at a minimum and puts cooperative learning in the correct context (1987).

Johnson and Johnson feel that students must be taught cooperative learning skills and be motivated to use them. People do not instinctively know how to effectively interact with each other. If group members lack the interpersonal and small-group skills to cooperate effectively, cooperative groups will not be productive. If cooperative learning is to
realize its potential, these skills need to be taught in an organized manner, such as social studies, mathematics, or any other subject area. "If teachers do so, they will not only increase student achievement, they will also increase students' future employability, career success, quality of relationships, and psychological health" (1989, p. 33).

The Greenwich, Connecticut Public Schools instituted cooperative learning in their schools in October 1983. Interested staff members were provided extensive training and district wide support from the beginning. They were easily convinced of the value of the strategy and quickly turned research and theory into practical group lessons for their students.

These teachers admitted that learning to use cooperative learning strategies takes much effort and time. However, after six years of actively using the strategy, it has proven to more than repay the teachers' investment. It benefits students both socially and academically. They feel that other educators can learn from their experiences and implement new and more effective ways of using cooperative learning in the classroom (Ellis, 1989).

Benefits of Cooperative Learning

Experts

Robert E. Slavin is the director of the Elementary School Program, Center for Research on Elementary and Middle Schools at Johns Hopkins University. Dr. Slavin has
conducted many research studies on the benefits of cooperative learning in schools. He found many positive effects for students who participated in cooperative learning programs.

These programs were successful for a wide range of ability levels and showed equal benefits for all students. The methods used were effective throughout the school systems, from elementary to high school, and rural to urban. The methods worked equally well in a wide variety of subjects. These included writing, reading, science, mathematics, language arts, social studies, and foreign language (Slavin, 1986).

Higher achievement is not the only product of cooperative learning, however. Experts have also found that students' opinions of their fellow classmates improve after participating in cooperative learning activities. This has been proven to be particularly true of students being accepted who are from different backgrounds and those who are mainstreamed. The most significant social result of cooperative learning is that the students' self-esteem improves and thus they learn to appreciate each other in a cooperative setting (Slavin, 1986).

Michael R. Hannigan is a staff associate for the Biological Sciences Curriculum Study (BSCS). This study, which developed a new science program for elementary schools, utilized cooperative learning as a central strategy for
numerous reasons.

Most importantly, cooperative learning improved the ability of children to construct knowledge. Group work allows children time to talk and think about what they are doing and how it all connects with the world. In cooperative groups the students learn to communicate their thoughts and thus it becomes more personal than the regular classroom (Slavin, 1989).

Second, a teacher who uses cooperative learning techniques ultimately improves his or her classroom management. A science environment which utilizes hands-on activities, is structured so that the students, not the teacher, manage the materials. When students help each other with difficult problems, it is easier for the teacher to maintain order and keep students on task (Slavin, 1989).

The improved self-confidence of students during cooperative learning activities is the third benefit. In a traditional classroom students often have a fear of being wrong in front of the class and thus often say nothing at all. However, in small groups many students speak out and discover that they have many ideas that are worth contributing (Slavin, 1989).

Finally, cooperative learning is a direct reflection of the way scientists actually work, which is in teams. Technology and science are cooperative projects where thousands of researchers, engineers, and laborers work
together to help our world. Neil Armstrong was the first person to walk on the moon due to the teamwork exhibited by all these people. This is why cooperative learning holds a significant place in the BSCS science curriculum (Slavin, 1989).

Mara Sapon-Shevin and Nancy Schniedewind (1989) were early implementers and proponents of cooperative learning. They strongly believe in the potential it has for society, schools, and classrooms. It helps create communities that care about each other and ultimately produces a high level of achievement in many areas. Cooperative learning helps students, teachers, and schools become models of democracy. It allows students and schools a voice in the implementation of fair policy and then everyone learns from the process.

Lawrence Sherman of Miami University and Mary Thomas of Ross Public Schools conducted a research project with two high school general mathematics classrooms. Each class was taught a unit of percentages. Cooperative learning was utilized in one classroom and an individualized structure was used in the other.

While neither group significantly differed from the other on a pre-test, the cooperative group demonstrated significantly higher achievement on the post-test than the individualistic group. Both groups obtained significantly higher post-test achievement scores as contrasted with their pre-test scores. The data
strongly support Deutch's (1949) theories concerning the effectiveness and motivating qualities associated within a group competition among small cooperating classroom groups. The ease with which Student Teams-Achievement Divisions/Teams-Games-Tournament techniques can be developed by classroom teachers (Slavin, 1982) as well as their effectiveness (Johnson, Johnson, & Anderson, 1976), would lead one to conclude that teachers of general mathematics and other disciplines should give this approach serious and favorable consideration. (1986, p. 172)

Curriculum standards in many states are suggesting that schools increase the use of cooperative learning to help students successfully solve sophisticated and difficult problems.

As explained in the National Council of Teachers of Mathematics' (NCTM) Curriculum and Evaluation Standards for School Mathematics (1989) for grades 5 to 8 (p.78), 'opportunities to explain, conjecture, and defend one's ideas orally and in writing can stimulate deeper understanding of concepts and principles.' Students need to learn how to use each other in order to become more effective mathematicians. Research shows that explaining is more effective for learning than sharing the answer for both the helper and for the student who receives the help. (Webb, 1991, p. 521)
This cooperation among students significantly increases their ability to solve problems and definitely promotes a positive regard for ethnic groups and female students. Communication of mathematical ideas is the cornerstone in the development of a greater understanding of mathematics for all students (Farivar & Webb, 1984).

An experiment by Sharan, Ackerman, & Hertz-Lazarowitz (1979/1980) comparing academic achievement of students taught in a traditional classroom with one using small cooperative groups showed a variety of results. The experiment found that small-group instruction led to outstanding achievement in higher order thinking skills. The traditional classroom, however, did not show significant gains in higher order thinking skills. These findings support the hypothesis that was stated for the experiment. In addition, the findings support the hypothesis that there will be no difference from one group to the next in learning that requires thinking at the first levels of Bloom's taxonomy. "Of course, this finding also means that small-group learning is not less effective than traditional teaching even in the pupils' acquisition of basic information" (Sharan, Ackerman, & Hertz-Lazarowitz, 1979/1980, p. 128).

The traditional presentation/lecture format of teaching was not found to promote the psychological well-being of the children. However, it appears that small-group learning enhances the children's psychological and social welfare in
the classroom. Thus, the experiment proved small-group learning to be an effective alternative to traditional methods of teaching (Sharan, Ackerman, & Hertz-Lazarowitz 1979/1980).

The use of mathematics partners helps students to model reasoning and also requires them to communicate their thoughts. Communicating mathematically is another goal presented in the NCTM's Curriculum and Evaluation Standards (1989). This cooperative communication between partners is a critical element in the success for students (O'Connell, 1992).

O'Connell (1992) assessed the effect that partners had on the students' ability to solve problems. Scores of students without partners were compared with the students who did have partners. She found that the benefit of having a partner improved those students' scores by 39 per cent.

Research suggests that when students are presented with challenging mathematical tasks and the opportunity to interact with peers it leads to higher level mathematical thinking. These advanced mathematical tasks called for in cooperative group lessons often motivate students to work together to solve them (Good, Reys, Grouws, & Mulryan, 1989/1990).

Another benefit of small-group instruction is that it facilitates an environment in which risk-taking is encouraged and math anxiety is reduced. In cooperative groups students
are not afraid to make mistakes or ask questions (Taylor, 1989). In addition, Coxford and Hirsch believe that "group work provides support for struggling students and helps all students to clarify their understanding by discussing mathematical ideas within the group" (1996, p. 25).

The NCTM's 1989 report indicated that teachers should make problem solving skills an integral part of the curriculum. Cooperative learning groups are highly recommended as a method for teaching problem solving. Research has shown that students who work with partners persevere in problem solving longer than those without partners (O'Connell, 1992).

Through cooperative learning, students discover other ways of attacking problems and are able to model proven strategies. Solving problems cooperatively places the emphasis on the process, not on the answer to the problem. This interaction among students generates new questions, new ideas, and new answers that stimulate mathematical thinking (O'Connell, 1992).

Mathematics teachers today are finding that when students work together they become better problem solvers. In a true cooperative problem solving situation, all students in the group work together to solve a problem that none of them has previously mastered. Kroll, Masingila, & Mau (1992) feel that the incorporation of grading into your overall cooperative learning plan is an important element to the
success of group problem solving. "Clearly, teaching according to the vision of the NCTM's Curriculum and Evaluation Standards (1989) involves changes in how students are evaluated, as well as changes in content and instruction" (Kroll, et al., 1992, p. 22). The assigning of grades for cooperative work clearly meets the vision set forth by the NCTM's Curriculum and Evaluation Standards (1989). Thus, the benefits gained from small group work definitely outweigh the problems that this new approach may present (Kroll, et al., 1992).

Besides achievement, there is even broader consensus about the positive effects due to cooperative learning. The most consistent of these is the effect on intergroup relations. When students of different ethnic or racial backgrounds work together, they gain a respect and liking for one another (Slavin, 1989/1990). A study done by Spencer Kagan also supports these findings. Kagan is a Professor of Psychology and faculty member in the School of Education at the University of California-Riverside. He concludes that when heterogeneous teams are created, not only by achievement, but also by race the result is a strong improvement in race relations (Brandt, 1990).

There is strong evidence that minority students, "especially African-American students do well in cooperative learning situations because this approach is consistent with the social learning values and reward structures of their
homes and communities" (Haynes & Gebreyesus, 1992, p. 583).

Cooperative learning approaches represent a viable alternative to the traditional practices presented in today's classrooms. Even though cooperative learning may not work for all African-American students, it is a valuable practice that does not conflict with most minority students (Haynes & Gebreyesus, 1992).

Native American students generally enter school having a difficult time adjusting to the traditional classroom and authoritarian teacher. Native Americans have core values that include sharing and cooperation. Traditionally, Native American students tend to be group-centered and are accustomed to sharing everything with their family. Native American students enter school with advanced social behaviors, possessing the ability to get along with others, take turns, and work well in groups. The traditional school often does not recognize these strengths or reward them in any significant way (Soldier, 1989).

The potential benefits of cooperative learning for Native American students are clear. Cooperative learning appears to improve student achievement, and it also matches such traditional Indian values and behaviors as respect for the individual, development of an internal locus of control, cooperation, sharing, and harmony. Cooperative learning can improve the attitudes of students toward themselves, toward others, and toward
school, as well as increasing cross-racial sharing, understanding, and acceptance. (Soldier, 1989, p. 163)

Teachers

Dianne K. Augustine, Kristin D. Gruber, and Linda R. Hanson are teachers of grades 6, 3, and 4, respectively, at Dayton Elementary School in the Anoka-Hennipin School District in Dayton, Minnesota. These teachers feel that cooperation works and can benefit all students, even those who are mainstreamed, gifted, or low-achieving. "With the combined total of 48 years in the classroom and 23 years using cooperative learning strategies, we are confident that cooperation works: it promotes higher achievement, develops social skills, and puts the responsibility for learning on the learner" (Augustine, Gruber, & Hanson, 1989/1990, p. 4).

All three of these teachers have seen improved achievement from their students in many curriculum areas. They have seen cooperative groups provide support and encouragement to students who previously were considered low-achieving. Finally, and most importantly, these students' achievement improved dramatically by the end of the year. One student was actually failing many of his classes at the beginning of the year and passing all classes by mid-February.

These teachers feel that "many mainstreamed students lack social skills and have low self-esteem. When they are
placed in small heterogeneous cooperative groups and assigned specific roles, their achievement generally increases and their psychological health improves" (Augustine, et al., 1989/1990, p.5). The teachers found that the group helped each other study for quizzes. This was especially true when they knew that their group score would be the average of their individual scores. This system promoted positive interdependence or a feeling that they were all in it together.

Augustine, Gruber, and Hanson (1989/1990) did find that parents of gifted students are sometimes skeptical of the benefits of cooperative learning. However, they found many instances where the parents agreed that their child received benefits from the interaction and were enthusiastic about the critical thinking that took place within the groups. In addition, the parents realized that the sharing of ideas and the showing of respect for others' opinions was an important life long skill to be learned. Finally, the authors found that cooperative assignments seldom have a negative effect on high-achieving students.

Augustine, Gruber, and Hanson (1989/1990) concluded that the implementation of cooperative learning has profoundly changed their perception of teaching and learning. They expect to see students discussing topics in small groups while using effective social skills. In addition, they feel that caring about each other's learning is another important
aspect for success. They hope other educators will expect high achievement from their students, improved attitudes toward school and an increased acceptance of others, and will use cooperative learning to meet these goals.

James L. Schultz, a K-12 Language Arts District Department Head at Burnt Hills-Ballston Lake Schools, in Burnt Hills, New York said this about cooperative learning: "Thanks to cooperative learning, my students are now satisfying some of their needs for freedom and love or at least for fellowship and fun. The most significant improvement I have observed is in their attitude toward learning" (Schultz, 1989/1990, p. 44).

Schultz feels that cooperative learning helps control behavior problems in the classroom and increases the time on-task of his students. An incident in one of his classes convinced him that cooperative learning keeps the students responsible for their own learning. Schultz attended a conference on a Monday, and when he returned the next day, he learned that the substitute had been late arriving to class. When she did get to class, she found the students busily sharing ideas in their groups. The students obviously proved that they were motivated to communicate, and learn with or without a teacher present (Schultz, 1989/1990).

In the short time that I have been trying cooperative learning units, I have felt a huge weight lifted from my pedagogical shoulders. As Popp (1987) says, "the
teacher's authority has shifted from being 'in authority' to being 'an authority'." I no longer feel like a worker trying to "sand, polish, and paint students into educated objects" (Gough, 1987), but rather like a facilitator working with people who are discussing a book together, researching a topic together, evaluating a project together - working in the way they will work in the world outside school. (Schultz, 1989/1990, pp. 44-5)

Roy A. Smith is an English teacher at Hingham Junior High School in the state of Massachusetts. He attended a workshop presented by Johnson and Johnson from the Cooperative Learning Center at the University of Minnesota. The workshop changed Smith's entire approach to teaching. He even felt that it kept him from quitting the profession. He now firmly believes in cooperative learning for several reasons. "First, it places the responsibility for learning where it belongs: on the students. Second, it increases achievement and improves students' attitudes toward school, toward learning, and toward classmates. Third, it makes both teaching and learning more fun" (Smith, 1987, p. 663).

However, Smith points out that students who have not been taught cooperative skills are sometimes unpleasant and unproductive in groups. The fear is that a few students are doing most of the work. In contrast, the students who have learned how to cooperate in groups, enjoy their time working
together and producing high-quality material (Smith, 1987).

The requisite skills for cooperative learning can be taught to students at all levels, from kindergarten through graduate school, and in all content areas. Teaching the skills takes some time early in the school year, but the payoff comes later in increased achievement and better attitudes (Smith, 1987).

Parents

Do parents support the use of cooperative learning in schools? Most parents do, especially those who come from an upper-middle-class economic background. For example, when Roger Johnson talked to a Parent Teacher Association in a suburban district from the city of New York, a parent stood up and said, "I know exactly what you're talking about: it's management training, the same thing we're getting at the First Bank. You mean my kid learns math and gets management training at the same time?" (Brandt, 1987, p. 16)

Cooperative learning in that district is seen as a bonus because the students are receiving training in conflict management, leadership, and group decision making. All of these skills are needed by the students later in life (Brandt, 1987).

Students

The students in Roy A. Smith's ninth grade classes were asked to give their perspectives of cooperative learning. There were many insightful and perceptive responses.
Generally, the reactions of the students were supportive, although some students mentioned drawbacks of cooperative learning. Those drawbacks were failure to get along with other members of the group, kids who did not do their share of the work, and individuals who don't listen enough and talk too much (Smith, 1987).

There were many advantages or positives pointed out by Smith's students (Smith, 1987) as to the benefits of cooperative learning. One important point given by many of the students was that they were able to freely share and receive many different points of view. This enabled them to get more ideas, which led to better quality work and thus improved grades. In addition, the students felt a sense of accountability to their fellow classmates as far as the quality of work and the timeliness of completion. Finally, small group work motivated the students and increased the interest in the subject matter being taught. Emily Shannon summed up the students' feeling in this way:

The atmosphere manages to be chaotic, controlled, relaxed, high-powered, and extremely productive all at once. How? Perhaps it's the variety of personalities, backgrounds, opinions, and intelligence in a class. I have found that a class conducted in such a way is more productive and enjoyable and less tense, less tedious, than the general classroom. The students seem to excel in such an atmosphere, approaching each task positively.
and eagerly. (Smith, 1987, p. 666)

**Drawbacks**

There are some drawbacks in the use of cooperative learning as a method of instruction in schools today. Several disadvantages to using cooperative learning during mathematics instruction have been found. First, curriculum materials need to be vastly improved and designed specifically for cooperative learning. In addition, tasks were often not group dependent and thus did not work well for cooperative learning. Many students became passive during group work and higher-ability students liked to work alone or control the group in some way. However, the researchers pointed out that the teacher's expertise ultimately decides the success or failure of cooperative learning in math instruction (Good, et al., 1989/1990).

Gifted students have a difficult time understanding why the other kids can't figure out how to do the problems. They resent explaining material to students who don't listen to them. However, they do enjoy helping other students who want to learn. Most gifted students say that they don't understand the material better as a result of having explained it to others. Finally, these students were much less negative about cooperative learning when they worked with other students at their level (Matthews, 1992).

Cooperative learning seems to benefit talented and gifted students, but proper implementation is an integral
aspect of its effectiveness. We need to allow gifted students time to work with each other. Research shows when gifted students are ability grouped for a portion of the school day, they achieve at a greater level than those not grouped together for learning (Matthews, 1992).

Ultimately, the teacher should make the decisions as to whether it is appropriate for gifted students to be grouped heterogeneously. At times, gifted students should work in their own groups, especially when tackling challenging problems. When this happens all students gain from cooperative grouping arrangements (Matthews, 1992).

A final drawback observed by one expert of cooperative learning is the use of group grades. Kagan, a supporter of cooperative learning, believes that "the group grade breaks the one-to-one connection between what one does and the grade one receives" (1995, p. 22). He feels that group grades are not fair, they debase report cards, undermine motivation, convey the wrong message, violate individual accountability, and are responsible for the resistance to cooperative learning (Kagan, 1995).

Kagan (1995) gives many alternatives to group grades. First, written feedback from teachers, teammates, and other classmates reduces the need for grades as a source for motivating students. A second alternative is to meet with students on an individual basis to determine if they have met their own goals. Finally, he suggests giving students
feedback on non-academic abilities such as specific cooperative skills. "By eliminating group grades, we will not only make grading fairer and more meaningful, but also remove a major source of resistance to cooperative learning" (Kagan, 1995, p. 22).
CONCLUSIONS AND RECOMMENDATIONS

My own personal experience with the use of cooperative learning for mathematics instruction makes me a firm believer in its effectiveness as a method of instruction for curriculum areas. The research that I have done for this review has definitely reinforced my strong belief as to the benefits of cooperative learning as a viable method of instruction for schools.

Unlike some other innovations in education, cooperative learning has not been a flash in the pan. After years of attention, it remains a hot topic among educators and is helping to foster a climate of cooperation among school faculties. According to Spencer Kagan (Willis, 1992, p. 2), cooperative learning is "spreading and becoming more mainstream." Cooperative learning is "still definitely growing" in popularity, says Robert Slavin (Willis, 1992, p. 2).

After almost two decades of research and numerous studies a considerable degree of agreement has emerged as to the benefits of cooperative learning. This agreement concludes that cooperative methods that incorporate individual accountability and group goals immensely accelerates student learning. In addition, these methods have many positive effects on a wide range of affective outcomes, such as intergroup relations, increased friendships among students, acceptance of mainstreamed students, and
gains in self-esteem. Finally, research studies show that cooperative learning increases students' liking of school, the subject matter being studied, time on task, and attendance (Slavin, 1990).

The two most recognized experts in the field of cooperative learning had this to say as to the importance of this trend. Robert Slavin, believes, "cooperative learning is a good way to build a school climate that fosters cooperation among all" (Willis, 1992, p. 2). David W. Johnson said, "If there's any one educational technique that has firm empirical support, it's cooperative learning...There is probably more evidence validating the use of cooperative learning than there is for any other aspect of education..." (Brandt, 1987, p. 16).

Cooperative learning should continue to be promoted by administrators and teachers as an effective method of instruction for future schools. With the influx of new professionals in the field of education, I see the use of cooperative learning instruction increasing in the future. Teachers, students, parents, and the business community all see the rewards of solving problems by utilizing team work. Researchers should continue to search for the best ways to implement cooperative learning in our schools and then determine if the benefits carry over into the real world.
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