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Cooperative learning also attempts to change the social and motivational environment in the classroom to promote positive and supportive peer interactions and a positive orientation toward achievement and learning. This selection on cooperative learning will describe the philosophical and historical roots of cooperative learning. It will describe the theory behind the positive effects of cooperative learning and finally discuss some of the common cooperative learning methods used in elementary, secondary, and college instruction.

In many forms of cooperative learning, teachers initially lead instruction as a way to communicate new information or skills to students. As the students practice the new learning, the teacher guides them to develop more proficiency. Gradually, the students take the instructional lead as they interact with peers practicing collaboratively. This type of transfer of responsibility for learning, from the teacher increasing gradually to the students, is characteristic of most forms of cooperative learning.

There is an important distinction between cooperative learning and more traditional group work. Cooperative learning has structural features that are important to determining how the students work within the group and the effects that cooperative learning has on both academic and social outcomes. Most researchers believe it is important for well-structured cooperative learning to have a group goal and individual accountability. The group goal is the reason for the group members to collaborate; it motivates the students to work together and creates the interdependence necessary for a well-functioning group. Some examples of group goals include a written report, a product for a project, or an average test score for the group. The individual accountability is the reason for each group member to learn, and it is critical for the positive academic benefits found in cooperative learning research. The individual accountability ensures that each member of the group does his or her share of the work. Well-structured cooperative learning differs greatly from traditional group learning in large part because group work did not necessarily include individual accountability. For example, it is possible for one person in the group to write the whole report or to do most of the problems in the group activity. This kind of group work is less likely to lead to the kind of positive social and academic effects found in the research on cooperative learning.

COOPERATIVE LEARNING

Cooperative learning is an instructional process that engages students in collaborative discussions about the content to promote learning. The discussions may involve teaching, explaining, asking questions, quizzing, or checking, in an instructional activity where students actively share in the responsibility for learning. Cooperative learning processes significantly restructure classrooms from passive learning environments, with the teacher dominating the instructional conversation, into engaging environments where students actively participate in the learning environment.

Historical Background

Cooperative learning is not a new idea in education. Certainly, one of the early uses of cooperative learning occurred in the one-room schoolhouse, where one teacher was forced to teach students with a very wide range of abilities and ages. It is likely that teachers used collaboration among students as a pragmatic response to a challenging teaching situation. The philosophical notion of learning through peer collaboration is seen much earlier, in the writing of Quintilian (1st century) and Comenius (17th century), up to more recent work by John Dewey (20th century). All discuss the potential benefits of students teaching and learning from one another, yet it is unclear whether any of these earlier conceptions of cooperative learning took hold in the educational settings of the day.

Current applications of cooperative learning trace its development to sociology and social psychology in the mid-20th century, specifically to Gordon Allport's Social Contact Theory and Morton Deutsch's studies of group dynamics. While studying racial prejudice in social settings, Allport found that prejudice was reduced in settings where racially diverse people had close, substantive contact while working to achieve a common goal. The quality and depth of the racial interaction was an important factor in reducing racial prejudice. This became an important issue as public schools in the United States began the long task of desegregating, and overtly prejudiced behavior and poor peer relations were typical in newly desegregated schools.

Similarly, Deutsch's work provided social psychological support to this theory. In his work on competition versus cooperation, Deutsch found that in cooperative settings, where an individual's success was dependent on the success of others, individuals engaged in more positive communication with one another. These positive and supportive communication patterns led to groups with higher productivity and significantly more positive peer relations. This contrasted with the findings that competitive environments led to less group cohesion, fewer facilitative interactions, and generally less positive peer relations.

Social Outcomes of Cooperative Learning

These social psychological developments became of particular interest to educational psychologists in the 1960s and 1970s as research in desegregated

schools found that racial prejudice and segregation within the schools were prevalent. Researchers applied social contact theory to the problem of diminishing prejudice and poor peer relations in newly desegregated schools. Early work on cooperative learning models such as Jigsaw and Teams Game Tournament attempted to put students together in groups to collaborate on common goals in an attempt to engage them in the kind of substantive contact that Allport had noted reduces prejudice. The research by Elliott Aronson, David DeVries, Robert Slavin, and David Johnson found that cooperative activities that engaged students of different races and backgrounds in substantive, academically oriented dialogue decreased prejudice and increased the quality of peer relations. The effects of cooperative learning on improving peer relations were found to transfer to relations outside the classroom, and positive peer relations remained during the school year even after the cooperative learning activities were over.

Academic Outcomes of Cooperative Learning

As cooperative learning research became more prevalent in schools, researchers noticed significant increases in academic performance among the cooperative groups. This was a natural extension of Deutsch's previous work on group dynamics as the group's positive and supportive communications led to higher productivity. Initially, the research on academic benefits used generic models of cooperative learning like Student Teams Achievement Division (STAD), Jigsaw, Learning Together, and Group Investigation (all described below). These models engage students in cooperative learning processes where they interact collaboratively on academic content. The models are not content specific and can be used with almost any instructional content. Typically, teachers use them as periodic activities to facilitate learning the content, often as an interactive way to practice the content or skills.

Similar research on student learning in university settings has also found academic benefits of cooperative learning. Researchers such as Alison King, Donald Dansereau, and Angela O'Donnell have found that peer collaboration during lecture and while reading textbooks can improve students' learning and retention of the content being presented.

Over time, some cooperative learning models became closely connected with specific content, becoming an instructional process integrated into daily instruction rather than an add-on activity that students engaged in periodically (e.g., weekly). Content-specific models of cooperative learning include Reciprocal Teaching and Cooperative Integrated Reading and Composition in reading and language arts, and Team Accelerated Instruction in mathematics. These content-specific models were found to have similar advantages for student learning.

The Nature of Cooperative Dialogue

For cooperative learning to be effective in promoting achievement, the cooperative dialogue must go beyond the “facilitative communication” first described by Deutsch. Research has found that not all student help is effective in increasing the achievement of both members of the dyad. Peer communications that result in terminal responses, where one student simply tells the answer to the other student, do little to increase the learning of either the student who gives the response or the student who receives the response. On the other hand, when a student provides an explanation as a response, like telling how to find the correct answer or explaining why an answer is correct, both students are likely to benefit from the experience. Receiving an explanatory response helps a student learn or encode something he or she previously did not know. More importantly, giving an explanation helps the other member of the dyad to process what he or she has learned in his or her own words, making more connections between the new information and his or her prior knowledge and enhancing understanding. Some research has suggested that the students who provide elaborative explanations actually experience greater achievement benefits than their peers who receive the elaborative explanations.

Multiple Theoretical Rationales for Cooperative Learning

A number of theoretical rationales have been used to develop and explain cooperative learning activities. As described above, the earliest rationale was based upon sociological theory relating to social contact and social psychological theory relating to group dynamics. These theories predicted and explained the positive social outcomes found in early cooperative

learning research; however, the theories did little to explain the learning outcomes.

Generative Learning Theory

Perhaps the most prevalent theory for explaining cooperative learning’s academic effects is generative learning theory. Generative learning suggests that when learners explain something to someone else in their own words, they increase their understanding of what they explain. Generative learning is situated within the information processing model of cognitive learning theory and specifically focuses on the processes involved in the activation of prior knowledge so that new knowledge is integrated with previously learned knowledge, thus increasing the probability of comprehension and recall of the new knowledge. This theoretical view explains the importance of giving elaborative explanations during cooperative learning to promote learning for not only the student who receives the explanation, but also for the student who gives the explanation. Generative theory provides a rationale for the evidence that high-ability students gain as much or more academically from cooperative learning as do average- or lower-ability students. Although common knowledge would cause one to expect lower-ability students to have the greatest benefits from cooperative learning processes, generative learning theory helps to explain why this is not necessarily the case.

The generative learning benefits during cooperative learning depend on students explaining or elaborating to one another; thus, teachers must monitor the interactions to make sure students provide explanations and do not provide terminal responses. Teachers also need to ensure that all students, regardless of ability, have an opportunity to provide elaborative explanations. To some extent, research has found that scripting interactions where students alternate roles in the elaborative dialogue can remedy the issue of equal opportunity to engage in the generation of explanations.

Sociocultural Learning Theory

Other cooperative learning research uses sociocultural theory and Lev Vygotsky’s work to explain the academic effects of cooperation. Vygotsky suggests that development and learning occur as individuals internalize new information and skills, those within the proximal zone of development. In particular, Vygotskian theory states that for complex cognitive tasks, learners benefit

from interactions with more competent peers, like those interactions in cooperative learning. The theory suggests that interaction facilitates the internalization of newly learned skills. This type of interaction has also been called a cognitive apprenticeship, where learning occurs while engaging in academic interactions with a more competent peer or adult. The theory offers an understanding of the broader sociocultural context of cooperative learning, yet it may not fully explain the learning processes involved.

Sociocultural theory revolves around the ability of peers to provide guidance and feedback to one another during the collaborative dialogue, and their ability to do this effectively may depend on the age and sophistication of the students. Researchers have found that directly teaching, guiding, and monitoring students in how to engage in collaborative dialogue increases students' capability of providing these kinds of interactions.

Piagetian Learning Theory

Piagetian theory has also been applied to understanding the effects of cooperative learning, specifically through the concepts of construction of knowledge and cognitive conflict. The theory suggests that contradictory views, such as those that might occur in cooperation with a peer, create cognitive conflict. Piagetian theory suggests that cognitive conflict results in disequilibrium that drives the learner to attempt to solve the internal conflict and hence construct meaning. Cooperative learning creates social interactions in which cognitive conflict occurs, and where continued collaborative dialogue (e.g., elaborative explanations) leads to conflict resolution and cognitive re-equilibration. The theory suggests that in cooperative learning, the interactions with peers stimulate this cognitive process that in turn increases learning of new information and skills.

This type of cooperative learning puts a premium on students learning how to work together in attempts to solve problems and resolve disagreements. Team-building activities are essential in order for groups to have sufficient cohesion and conflict resolution skills to work through their disagreements and collaborate in their investigations. The teacher's role is to promote team building and to act as a facilitator in guiding learning through investigation.

Sociocognitive Learning Theory

Albert Bandura's sociocognitive theory has also been used to explain the impact of cooperative

learning processes on students' learning. Sociocognitive theory suggests that the learner will benefit from models in the environment, such as interacting with peers to promote both learning and motivation. At the same time, the theory suggests that the learner will reciprocally influence the group in the process, through goal setting, self-efficacy, and self-regulation during the cooperative processes. The reciprocal influence in this theory helps to explain many of the influences in peer collaboration; however, the internalization of learning, although mentioned, is not explicated.

To a great extent, these theories are not incompatible with one another, nor do they contradict one another in attempting to explain and describe the effects of cooperative learning on learning. Instead, they offer different foci in attempts to explain the nature of cooperative learning processes and the learning processes they promote. Because of their different foci, no single theory seems to capture all that is important about learning during cooperative interactions. Each offers a somewhat different insight into cooperative learning processes.

Selected Cooperative Learning Methods

There are a variety of methods for integrating cooperative learning into classroom instruction. The methods reflect differences in theoretical perspective, student population, or the nature of the instructional content. This list is by no means all inclusive; it is only intended to provide descriptions of methods to show the variety of different ways cooperative learning has been applied to classroom instruction. The initial models will be generic models that are cooperative learning processes that can be applied to a wide range of content. The latter models will be content-specific models specifically designed for use in one content area.

Jigsaw

Jigsaw is one of the earliest models of cooperative learning processes, and it was developed by Elliott Aronson. Jigsaw is best used with students in elementary school through college for learning narrative content (e.g., learning from a chapter in a text, doing a research report) and when the goal is content knowledge rather than skills. Teams are typically made up of four members. Members are assigned a portion of the

content that they are to research and learn so they can teach it to the other students in the team. In essence, they become the experts in that content. All of the students who are to become experts in the same content meet and work together on the important information for their area. After they have gathered the information, each expert returns to his or her team and teaches the content to the other students. In this way, each student has an opportunity to teach and elaborate on a portion of the content to his or her peers.

Student Team Achievement Division (STAD)

STAD is a cooperative learning method developed by Robert Slavin that is used in learning factual content (e.g., vocabulary, social studies or science information) as well as discrete skills (e.g., spelling, math computation, or language mechanics skills) for students in second through twelfth grade. Typically, it is used near the end of a unit of instruction and is used to promote active student practice in preparation for a test on the content. In STAD, the students are assigned to heterogeneous teams composed of four or five students. Initially, the teacher computes a base score in the content for each student, using a previous test(s) or a pretest. As students begin preparing for the end-of-the-unit test, they quiz one another about the material they are learning. Students then take the test, which is used to determine their grade and to determine their improvement points. Improvement points are based on the amount by which the student's performance increases above his or her previously computed base score. Improvement points are then used to calculate team scores for use in recognizing teams with good overall improvement. A large quantity of research on STAD consistently shows its positive effects on achievement and peer relations.

Teams Game Tournament

Like STAD, Teams Game Tournament (TGT) is used to promote students' learning of factual content or discrete skills, and is typically used near the end of a unit of instruction. In TGT, students from heterogeneous teams play an academic game, or tournament, that involves answering questions about the content, competing against three students of similar ability from other teams. The tournament involves students taking turns answering questions on the content. The other two students in the tournament can challenge the

student if they think he or she is incorrect. For every question the student answers correctly, the student gets a point. The points are used to calculate team scores, which, like STAD, are used for team recognition.

Group Investigation

Group Investigation is a cooperative learning method developed by Shlomo Sharan and Rachel Hertz-Lazarowitz in Israel that focuses on developing social skills and positive peer relations while learning academic content. The method is essentially cooperative inquiry, where students acquire, analyze, and synthesize information to solve a problem (e.g., write a research report, develop a plan of action). The groups work together to use resources such as texts, reference materials, and technology resources to collect relevant information. They then discuss how to organize the information for use in solving their specific problem. The teacher acts as a facilitator and guide, directing students to various information resources and asking them questions to guide their problem solving. At the end, each group presents a report of its work to the entire class. Research has shown that Group Investigation is particularly effective in increasing peer relations and developing students' interpersonal skills.

Learning Together

The Learning Together cooperative method developed by David Johnson and Roger Johnson is used in elementary and secondary school. The method emphasizes face-to-face interaction, positive interdependence, individual accountability, and interpersonal skills. Typically, Learning Together involves team building and teaching students appropriate interpersonal skills to facilitate the cooperative learning process. Some of the Learning Together methods have students study content together and quiz each other in preparation for individual tests. Other Learning Together methods involve students working together to complete a group test. Research on Learning Together has consistently indicated improved interpersonal relations and acceptance of peers.

Guided Reciprocal Peer Questioning

Guided Reciprocal Peer Questioning (GRPQ) is a cooperative learning method developed by Alison

King that was used initially with college-age students. Subsequent research has shown it can also be used effectively with children in the upper primary grades. GRPQ is used to help students actively process content presented in a narrative fashion, either in a textbook or from a lecture. Students are taught to ask questions about the content based upon question starters like “What does ____ mean?” “Describe ____ in your own words.” “Explain why _____.” Students ask a question to a partner, who attempts to answer it and then reciprocates by asking another question. This process can be used as students read a section of a textbook, or during a lecture when the instructor periodically stops to allow students to ask questions of a peer. Research has shown that students who use this method retain more information they read or hear in lecture, and it promotes metacognitive skills as students learn to ask themselves questions either during reading or when listening to a lecture.

Cooperative Integrated Reading and Composition

Cooperative Integrated Reading and Composition (CIRC) is a cooperative learning approach to teaching reading and language arts developed by Robert Slavin and Robert Stevens. CIRC has been used with students in second through fifth grade, and a companion model, Student Team Reading and Writing (STRW), has been used in middle school literacy instruction. CIRC is a multifaceted approach that involves students in learning both factual content (e.g., new vocabulary) and skills (e.g., reading comprehension and writing). The teacher provides initial instruction that is followed by students practicing collaboratively to complete tasks such as developing vocabulary knowledge, developing comprehension of the story, extending story comprehension through writing about the story, and engaging in the writing process for creative writing activities. Students check factual knowledge, make and elaborate on predictions, and provide clarifying explanations to one another about what they are reading. At the end of the instructional cycle (e.g., weekly), the students take tests, and the points earned on the test are used for team scores that are used for team recognition like that described above in STAD. Research studies have shown that CIRC and STRW have significant, long-term, positive effects on students’ achievement, attitudes, and peer relations.

Reciprocal Teaching

Reciprocal Teaching is a cooperative learning method developed by Annamarie Palincsar to improve reading comprehension skills for students in elementary and middle school. Reciprocal Teaching begins with the teacher providing explicit instruction on comprehension strategies related to questioning, clarifying, summarizing, and predicting as students read. The teachers follow the initial instruction by guiding students as they practice using the strategies by prompting them with questions that they answer. Over time, the students take more responsibility by using questions to prompt one another; the questions are followed by answers in a reciprocal dialogue. The teachers monitor and guide the dialogue, helping the students increase their accuracy and proficiency in using the comprehension-fostering strategies. Research provides evidence of the efficacy of Reciprocal Teaching for students from third grade through middle school, with particular emphasis on struggling readers. Students also maintain the benefits of Reciprocal Teaching after the conclusion of its use in instruction.

Team Accelerated Instruction

Team Accelerated Instruction (TAI) is a cooperative learning approach to mathematics instruction developed by Robert Slavin for use in elementary and early middle grades. TAI focuses primarily on teaching math computation skills in a way that allows students to move at their own pace as they master each skill. The teacher begins the instructional cycle with an ad hoc instructional group based on those students beginning that particular unit. Following the initial instruction, the students engage in practice activities to develop mastery of the new skills. Students work in heterogeneous teams, allowing team members to give feedback and explanations to one another as they practice. There is ongoing progress monitoring as students take periodic tests to assess mastery. Students also earn points for their team by the number of instructional units they master and their level of performance on the mastery tests. Team points are used in determining team recognition like that in STAD, described above. Research indicates that TAI improves students’ mathematics achievement and interpersonal relations for students of all abilities in second through sixth grades, and remedial secondary mathematics.

Across cooperative learning methods, there is remarkable consistency in how cooperative learning can positively influence academic and social outcomes in instruction across a variety of grade levels.

Robert J. Stevens

See also Cognitive View of Learning; Peer-Assisted Learning; Social Learning Theory; Vygotsky's Cultural-Historical Theory of Development

Further Readings

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