AN OVERVIEW OF COOPERATIVE LEARNING

Roger T. and David W. Johnson

Without the cooperation of its members society cannot survive, and the society of man has survived because the cooperativeness of its members made survival possible.... It was not an advantageous individual here and there who did so, but the group. In human societies the individuals who are most likely to *survive are those who are best enabled to do so by their group.*

(Ashley Montagu, 1965)

How students perceive each other and interact with one another is a neglected aspect of instruction. Much training time is devoted to helping teachers arrange appropriate interactions between students and materials (i.e., textbooks, curriculum programs) and some time is spent on how teachers should interact with students, but how students should interact with one another is relatively ignored. It should not be. How teachers structure student-student interaction patterns has a lot to say about how well students learn, how they feel about school and the teacher, how they feel about each other, and how much self-esteem they have.

There are three basic ways students can interact with each other as they learn. They can compete to see who is "best," they can work individualistically toward a goal without paying attention to other students, or they can work cooperatively with a vested interest in each other's learning as well as their own. Of the three interaction patterns, competition is presently the most dominant. Research indicates that a vast majority of students in the United States view school as a competitive enterprise where one tries to do better than other students. This competitive expectation is already widespread when students enter school and grows stronger as they progress through school (Johnson & R. Johnson, 1991). Cooperation among students-who celebrate each other’s successes, encourage each other to do homework, and learn to work together regardless of ethnic backgrounds or whether they are male or female, bright or struggling, disabled or not, is still rare.

BASIC DEFINITIONS

Even though these three interaction patterns are not equally effective in helping students learn concepts and skills, it is important that students learn to interact effectively in each of these ways. Students will face situations in which all three interaction patterns are operating and they will need to be able to be effective in each. They also should be able to select the appropriate interaction pattern suited to the situation. An interpersonal, competitive situation is characterized by negative goal interdependence where, when one person wins, the others lose; for example, spelling bees or races against other students to get the correct answers to a math problem on the blackboard. In individualistic learning situations, students are independent of one another and are working toward a set criteria where their success depends on their own performance in relation to an established criteria. The success or failure of other students does not affect their score. For example, in spelling, with all students working on their own, any student who correctly spells 90% or more words passes. In a cooperative learning situation, interaction is characterized by positive goal interdependence with individual accountability. Positive goal interdependence requires acceptance by a group that they "sink or swim together." A cooperative spelling class is one where students are working together in small groups to help each other learn the words in order to take the spelling test individually on another day. Each student’s score on the test is increased by bonus points if the group is successful (i.e., the group totals meet specified criteria). In a cooperative learning situation, a student needs to be concerned with how he or she spells and how well the other students in his or her group spell. This cooperative umbrella can also be extended over the entire class if bonus points are awarded to each student when the class can spell more words than a reasonable, but demanding, criteria set by the teacher.

There is a difference between simply having students work in a group and structuring groups of students to work cooperatively. A group of students sitting at the same table doing their own work, but free to talk with each other as they work, is not structured to be a cooperative group, as there is no positive interdependence. Perhaps it could be called individualistic learning with talking. For this to be a cooperative learning situation, there needs to be an accepted common goal on which the group is rewarded for its efforts. If a group of students has been assigned to do a report, but only one student does all the work and the others go along for a free ride, it is not a cooperative group. A cooperative group has a sense of individual accountability that means that all students need to know the material or spell well for the whole group to be successful. Putting students into groups does not necessarily gain a cooperative relationship; it has to be structured and managed by the teacher or professor.

ELEMENTS OF COOPERATIVE LEARNING

It is only under certain conditions that cooperative efforts may be expected to be more productive than competitive and individualistic efforts. Those conditions are:

1. Clearly perceived positive interdependence
2. Considerable promotive (face-to-face) interaction
3. Clearly perceived individual accountability and personal responsibility to achieve the group's goals
4. Frequent use of the relevant interpersonal and small-group skills
5. Frequent and regular group processing of current functioning to improve the group's future effectiveness

All healthy cooperative relationships have these five basic elements present. This is true of peer tutoring, partner learning, peer mediation, adult work groups, families, and other cooperative relationships. This conceptual "yardstick" should define any cooperative relationship.

Positive Interdependence

The first requirement for an effectively structured cooperative lesson is that students believe that they "sink or swim together." Within cooperative learning situations, students have two responsibilities: 1) learn the assigned material, and 2) ensure that all members of the group learn the assigned material. The technical term for that dual responsibility is *positive interdependence.* Positive interdependence exists when students perceive that they are linked with group mates in such a way that they cannot succeed unless their group mates do (and vice versa) and/or that they must coordinate their efforts with the efforts of their group mates to complete a task. Positive interdependence promotes a situation in which students: 1) see that their work benefits group mates and their group mates' work benefits them, and 2) work together in small groups to maximize the learning of all members by sharing their resources to provide mutual support and encouragement and to celebrate their joint success. When positive interdependence is clearly understood, it establishes that:

1. Each group member's efforts are required and indispensable for group success (i.e., there can be no "free-riders").
2. Each group member has a unique contribution to make to the joint effort because of his or her resources and/or role and task responsibilities.

There are a number of ways of structuring positive interdependence within a learning group.

Positive Goal Interdependence Students perceive that they can achieve their learning goals if' and only if all the members of their group also attain their goals. The group is united around a common goal -- a concrete reason for being. To ensure that students believe they "sink or swim together" and care about how much each other learns, the teacher has to structure a clear group or mutual goal, such as "learn the assigned material and make sure that all members of the group learn the assigned material." The group goal always has to be a part of the lesson.

Positive Reward -- Celebrate Interdependence Each group member receives the same reward when the group achieves its goals. To supplement goal interdependence, teachers may wish to add joint rewards (e.g., if all members of the group score 90% correct or better on the test, each receives 5 bonus points). Sometimes teachers give students: 1) a group grade for the overall production of their group, 2) an individual grade resulting from tests, and 3) bonus points if all members of the group achieve the criterion on tests. Regular celebrations of group efforts and success enhance the quality of cooperation.

Positive Resource Interdependence Each group member has only a portion of the resources, information, or materials necessary for the task to be completed; the members' resources have to be combined for the group to achieve its goals. Teachers may wish to highlight the cooperative relationships by giving students limited resources that must be shared (one copy of the problem or task per group) or giving each student part of the required resources that the group must then fit together (the Jigsaw procedure).

Positive Role Interdependence Each member is assigned complementary and interconnected roles that specify responsibilities that the group needs in order to complete the joint task. Teachers create role interdependence among students when they assign them complementary roles such as reader, recorder, checker of understanding, encourager of participation, and elaborator of knowledge. Such roles are vital to high-quality learning. The role of checker, for example, focuses on periodically asking each group mate to explain what is being learned. Rosenshine and Stevens (1986) reviewed a large body of well-controlled research on teaching effectiveness at the pre-collegiate level and found "checking for comprehension" to be one specific teaching behavior that was significantly associated with higher levels of student learning and achievement. Although the teacher cannot continually check the understanding of every student, the teacher can engineer such checking by having students work in cooperative groups and assigning one member the role of checker.

There are other types of positive interdependence. Positive task interdependence exists when a division of labor is created so that the actions of one group member have to be completed if the next member is to complete his or her responsibility. Positive identity interdependence exists when a mutual identity is established through a name or motto. Outside threat interdependence exists when groups are placed in competition with each other. Fantasy interdependence exists when a task is given that requires group members to imagine that they are in a hypothetical situation.

We have conducted a series of studies investigating the nature of positive interdependence and the relative power of the different types of positive interdependence (Hwong, Caswell, Johnson, & Johnson, 1993; Johnson, Johnson, Ortiz, & Starme, 1991; Johnson, Johnson, Stanne, & Garibaldi, 1990; Low, Mesch, Johnson, & Johnson, 1986a, 1986b; Mesch, Johnson, & Johnson, 1988; Mesch, Lew, Johnson, & Johnson, 1986). Our research indicates that positive interdependence provides the context within which promotive interaction takes place. Group membership and interpersonal interaction among students do not produce higher achievement unless positive interdependence is clearly structured. The combination of goal and reward interdependence increases achievement over goal interdependence alone and resource interdependence does not increase achievement unless goal interdependence is present also.

Face-to-Face Promotive Interaction

In an industrial organization, it's the group effort that counts. There's really no room for stars in an industrial organization. You need talented people, but they can't do it alone. They have to have help.

(John F. Donnelly, President, Donnelly Mirrors)

Positive interdependence results in promotive interaction. Promotive interaction may be defined as individuals encouraging and facilitating each other's efforts to achieve, complete tasks, and produce in order to reach the group's goals. Although positive interdependence in and of itself may have some effect on outcomes, it is the face-to-face promotive interaction among individuals fostered by the positive inter-relationships, and psychological adjustment and social competence. Promotive interaction is characterized by individuals providing each other with efficient and effective help and assistance; exchanging needed resources, such as information and materials, and processing information more efficiently and effectively; providing each other with feedback in order to improve their subsequent performance; challenging each other's conclusions and reasoning in order to promote higher quality decision making and greater insight into the problems being considered; advocating the exertion of effort to achieve mutual goals; influencing each other’s efforts to achieve the group's goals; acting in trusting and trustworthy ways; being motivated to strive for mutual benefit; and maintaining a moderate level of arousal characterized by low anxiety and stress.

Individual Accountability/Personal Responsibility

What children can do together today, they can do alone tomorrow.

(Let Vygotsky, 1962)

Among the early settlers of Massachusetts there was a saying, "If you do not work, you do not eat." Everyone had to do their fair share of the work. The third essential element of cooperative learning is individual accountability, which exists when the performance of individual students is assessed, the results are given back to the individual and the group, and the student is held responsible by group mates for contributing his or her fair share to the group’s success. It is important that the group-knows who needs more assistance, support, and encouragement in completing the assignment. It is also important that group members know they cannot "hitchhike" on the work of others. When it is difficult to identify members' contributions, when members' contributions are redundant, and when members are not responsible for the final group outcome, they may be seeking a free ride (Harkins & Petty, 1982; Ingham, Levinger, Graves, & Peckham, 1974; Kerr & Bruun, 1981; Latane, Williams, & Harkins, 1979; Moede, 1927; Petty, 1-larkins, Williams, & Latane, 1977; Williams, 1981; Williams, Harkins, & Latane, 1981). This is called social loafing.

The purpose of cooperative learning groups is to make each member a stronger individual in his or her own right. Individual accountability is the key to ensuring that all group members are, in fact, strengthened by learning cooperatively. After participating in a cooperative lesson, group members should be better prepared to complete similar tasks by themselves.

To ensure that each student is individually accountable to do his or her fair share of the group’s work, teachers need to assess how much effort each member is contributing to the group’s work, provide feedback to groups and individual students, help groups avoid redundant efforts by members, and ensure that every member is responsible for the final

outcome. Common ways to structure individual accountability include:

1. Keeping the size of the group small. The smaller the size of the group, the greater the individual accountability may be.
2. Giving an individual test to each student.
3. Randomly examining students orally by calling on one student to present his or her group's work to the teacher (in the presence of the group) or to the entire class.
4. Observing each group and recording the frequency with which each member-contributes to the group's work.
5. Assigning one student in each group the role of checker. The checker asks other group members to explain the reasoning and rationale underlying group answers.
6. Having students teach what they learned to someone else. When all students do this, it is called *simultaneous explaining.*

There is a pattern to classroom learning. First, students learn knowledge, skills, strategies, or procedures in a cooperative group. Second, students apply the knowledge or perform the skill, strategy, or procedure alone to demonstrate their personal mastery of the material. Students learn it together and then perform it alone.

Interpersonal and Small-Group Skills

I will pay more for the ability to deal with people than any other ability under the sun.

(John D. Rockefeller)

The fourth essential element of cooperative learning is the appropriate use of interpersonal and small-group skills. In order to coordinate efforts to achieve mutual goals, students must: 1) get to know and trust each other, 2) communicate accurately and unambiguously, 3) accept and support each other, and 4) resolve conflict constructively (Johnson, 1990, 1991; Johnson & F. Johnson, 1991). Placing socially unskilled students in a group and telling them to cooperate does not guarantee that they have the ability to do so effectively. We are not born instinctively knowing how to interact effectively with others. Interpersonal and small-group skills do not magically appear when they are needed. Students must be taught the social skills required for high quality collaboration and be motivated to use them if cooperative groups are to be productive. The whole field of group dynamics is based on the premise that social skills are the key to group productivity (Johnson & F. Johnson, 1991).

The more socially skillful students are and the more attention teachers pay-to teaching and rewarding the use of social skills, the higher the achievement that can be expected within cooperative learning groups. In their studies on the long-term implementation of cooperative learning, Lew and Mesch (Lew et al., 1986a, 1986b; Mesch et al., 1988; Mesch et al., 1986) investigated the impact of a reward contingency for using social skills as well as positive interdependence and a contingency for academic achievement on performance within cooperative learning groups. In the cooperative skills conditions, students were trained weekly in four social skills and each member of a cooperative group was given two bonus points toward the quiz grade if all group members were observed by the teacher to demonstrate three out of four cooperative skills. The results indicated that the combination of positive interdependence, an academic contingency for high performance by all group members, and a social skills contingency promoted the highest achievement.

Group Processing

Take care of each other. Share your energies with the group. No one must feel alone, cut off, for that is when you do not make it.

(Willi Unsoeld, Renowned Mountain Climber)

The fifth essential component of cooperative learning is group processing. Effective group work is influenced by whether or not groups reflect on (i.e., process) how well they are functioning. A process is an identifiable sequence of events taking place over time, and process goals refer to the sequence of events instrumental in achieving outcome goals (Johnson & F. Johnson, 1991). Group processing may be defined as reflecting on a group session to: 1) describe what member actions were helpful and unhelpful, and 2) make decisions about what actions to continue or change. The purpose of group processing is to clarify and improve the effectiveness of the members in contributing to the collaborative efforts to achieve the group’s goals.

While the teacher systematically observes the cooperative learning groups, he or she attains a "window" into what students do and do not understand as they explain to each other how to complete the assignment. Listening in on the

students' explanations provides valuable information about bow well the students understand the instructions, the major concepts and strategies being learned, and the basic elements of cooperative learning.

There are two levels of processing -- small group and whole class. In order to ensure that small-group processing takes place, teachers allocate some time at the end of each class session for each cooperative group to process how effectively members worked together. Groups need to describe what member actions were helpful and not helpful in completing the group's work and make decisions about what behaviors to continue or change. Such processing: 1) enables learning groups to focus on maintaining good working relationships among members, 2) facilitates the learning of cooperative skills, 3) ensures that members receive feedback on their participation, 4) ensures that students think on the metacognitive as well as the cognitive level, and 5) provides the means to celebrate the success of the group and reinforce the positive behaviors of group members. Some of the keys to successful small-group processing are allowing sufficient time for it to take place, providing a structure for processing (e.g., "List three things your group is doing well today and one thing you could improve."), emphasizing positive feedback, making the processing specific rather than general, maintaining student involvement in processing, reminding students to use their cooperative skills while they process, and communicating clear expectations as to the purpose of processing.

In addition to small-group processing, the teacher should periodically engage in whole-class processing. When cooperative learning groups are used, the teacher observes the groups, analyzes the problems they have working together, and gives feedback to each group on how well they are working together. The teacher systematically moves from group to group and observes them at work. A formal observation sheet may be used to gather specific data on each group. At the end of the class period the teacher can then conduct a whole-class processing session by sharing with the class the results of his or her observations. If each group has a peer observer, the results of their observations may be added together to get overall class data.

An important aspect of both small-group and whole-class processing is group and class celebrations. It is feeling successful, appreciated, and respected that builds commitment to learning, enthusiasm about working in cooperative groups, and a sense of self-efficacy in terms of subject-matter mastery and working cooperatively with classmates.

RESEARCH RATIONALE

Working together to get the job done can have profound effects on students and staff members. A great son & It. Johnson, 1974, 1978, 1983, 1989a; Johnson, Johnson, & Maruyama, 1983; Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; Pepitone, 1980; Sharan, 1980; Slavin, 1983). These research studies began in the late 1890s when Triplett (1898) in the United States and Mayer (1903) in Germany conducted a series on the factors associated with competitive performance. The amount of research that has been conducted since then is staggering. During the past 90 years, more than 600 studies have been conducted by a wide variety of researchers in different decades with different age subjects, in different subject areas, and in different environments. We know far more about the efficacy of cooperative learning than we know about lecturing, age grouping, beginning reading instruction at age 6, departmentalization, or almost any other facet of education.

Building on the theorizing of Kurt Lewin (1935) and Morton Deutsch (1949), the premise may be made that the type of interdependence structured among students determines how they interact with each other, which in turn largely determines instructional outcomes. The quality of peer relationships, furthermore, has widespread and powerful impact on individuals' cognitive and social development.

Cooperative Efforts and Achievement/Productivity

The highest and best form of efficiency is the spontaneous cooperation of a free people.

(Woodrow Wilson)

How successful competitive, individualistic, and cooperative efforts are in promoting productivity and achievement is the first question pragmatists ask about social interdependence. More than 875 studies have been conducted during the past 90 years to give an answer (Johnson & R. Johnson, 1989a). When all of the studies were included in the analysis, the average cooperator performed at about two thirds a standard deviation above average student learning within a competitive (effect size = 0.66) or individualistic situation (effect size 0.63). When only the high-quality studies were included in the analysis, the effect sizes are 0.86 and 0.59 respectively. Cooperative learning, furthermore, resulted in more higher level reasoning, more frequent generation of new ideas and solutions (i.e., process gain), and greater transfer of what is learned within one situation to another (i.e., group-to-individual transfer) than did competitive or individualistic learning.

The fad that working together to achieve a common goal produces higher achievement and greater productivity than does working alone is so well confirmed by so much research that it stands as one of the strongest principles of social and organizational psychology. Cooperative learning is indicated whenever learning goals are highly important, mastery and retention are important, a task is complex or conceptual, problem solving is desired, divergent thinking or creativity is desired, quality of performance is expected, and higher-level reasoning strategies and critical thinking are needed.

Participants in the research have varied widely as to economic class, age, sex, and cultural background. A variety of tasks and measures of the dependent variables have been studied. Studies have been conducted by many different researchers with markedly different orientations working in different environments and in different decades. This means that the overall body of research on social interdependence has considerable generalizability, as shown in Table 1.

Table 1. Social interdependence: Weighted findings

	Mean	Standard deviation	*n*[a]
Achievement			
Cooperative vs. competitive	0.66	0.94	128
Cooperative vs. individualistic	0.63	0.81	182
Competitive vs. individualistic	0.30	0.76	39
Interpersonal attraction			
Cooperative vs. competitive	0.65	0.47	88
Cooperative vs. individualistic	0.62	0.59	59
Competitive vs. individualistic	0.08	0.70	15
Social support			
Cooperative vs. competitive	0.59	0.39	75
Cooperative vs. individualistic	0.71	0.45	70
Competitive vs. individualistic	-0.12	0.37	18
Self-esteem			
Cooperative vs. competitive	0.60	0.57	55
Cooperative vs. individualistic	0.44	0.40	37
Competitive vs. individualistic	-0.19	0.40	18

[a]*n* = number of studies in sample

Interpersonal Relationships and Acceptance of Differences

One of the most important and long-standing goals of American education is to promote constructive relationships and positive attitudes among heterogeneous students. Almost every school district has acceptance of differences as one of their stated goals for students. Legislation exists that proclaims it is unlawful to segregate any student for educational purposes unless it is absolutely necessary. Ethnic minorities, students with disabilities, non—English-speaking students, and even females interested in science and math are examples of areas of students who need to be integrated with a wide variety of peers. Acceptance of differences is a central issue for all students.

Cooperative learning experiences, compared with competitive, individualistic, and "traditional" instruction, promote considerably more liking among students (effect sizes = 0.65 and 0.62 respectively) (Johnson & R. Johnson, 1989a; Johnson et al., 1983). This is true regardless of differences in ability level, sex, disability, ethnic membership, social class differences, or task orientation, Students who collaborate on their studies develop considerable commitment and caring for each other no matter what their initial impressions of and attitudes toward each other were when they started. They also like the teacher more and perceive the teacher as being more supportive and accepting academically and personally.

It is when students with disabilities are liked, accepted, and chosen as friends that inclusion becomes a positive influence on the lives of students with and without disabilities. Thus, any definition of inclusion that does not recognize the importance of relationships among students with and without disabilities is incomplete. It is peers without disabilities who provide students with disabilities entry into the typical life experiences of their age groups, such as going to dances, taking buses, going to movies, shopping, knowing what is "cool" and what is not, and dating. Constructive peer relationships are not only an absolute necessity for maximal achievement and healthy social and cognitive development, they may be the primary relationship within which development and socialization take place. Students with disabilities especially need access to peers who are highly motivated and behave appropriately. Placing students with disabilities in the corner of a classroom and providing individualistic learning experiences is not effective inclusion.

Inclusion is not something teachers do for a few students. It is something teachers do for every student in their class. The instructional procedures needed for the constructive inclusion of students with disabilities also benefit the shy student sitting over by the window, the over-aggressive student who seeks acceptance through negative behaviors, the bright but stereotyped student sitting in the front row, and the average student in the center of the classroom who needs very little help and is often neglected. *All* students need to be accepted and benefit from a classroom where it is acceptable to be different. We have also found in our research that when students without disabilities collaborate with their peers with disabilities on instructional tasks, the result is increased empathy, altruism, and an ability to view situations from a variety of perspectives. Even the most well-adjusted and hard-working students benefit from the instructional techniques associated with inclusion when it is structured effectively.

Accuracy of Perspective Taking

Social perspective taking is the ability to understand how a situation appears to another person and how that person is reacting cognitively and emotionally to the situation. The opposite of perspective taking is egocentrism, the embedded ness in one’s own viewpoint to the extent that one is unaware of other points of view and of the limitations of one's perspectives. Cooperative learning experiences tend to promote greater cognitive and affective perspective taking than do competitive or individualistic learning experiences (Johnson & R. Johnson, 1989a).

Creativity

Cooperative learning promotes creative thinking by increasing the number of ideas, quality of ideas, feelings of stimulation and enjoyment, and originality of expression in creative problem solving (Bahn, 1964; Bolen & ‘Thrrance, 1976; Dunnette, Campbell, & Jaastad, 1963; Ehlk & Johnson, 1977; Peters & ‘Ibrrance, 1972; Thrrance, 1970, 1971, 1973; Triandis, Bass, Ewen, & Mikesell, 1963). It is not surprising that students are "triggered" by the ideas of others and that different perspectives cause group members to consider a larger number of alternatives. The cooperative relationship also provides a context to consider and appreciate other group members’ ideas instead of ignoring (individualistic) or trying to come up with a better one (competition).

Self-Esteem

The data in Table 1 indicate that cooperation produced higher levels of self-esteem than did competitive and individualistic efforts (effect sizes of 0.58 and 0.44 respectively) with regard to self-esteem. Individuals with low self-esteem tend to (Johnson & R. Johnson, 1989a):

1. Have low productivity due to setting low goals for themselves, lacking confidence in their ability, and assuming that they will fail no matter how hard they try.
2. Are critical of others as well as themselves by looking for flaws in others and trying to "tear them down."
3. Withdraw socially due to feeling awkward, self-conscious, and vulnerable to rejection.
4. Are conforming, agreeable, highly persuadable, and highly influenced by criticism.
5. Develop psychological problems such as anxiety, nervousness, insomnia, depression, and psychosomatic symptoms.

Within competitive situations, self-esteem tends to be based on the contingent view of one’s competence that, "If I win, then I have worth as a person, but if I lose, then I have no worth." Winners attribute their success to superior ability and

attribute the failure of others to lack of ability, both of which contribute to self-aggrandizement. Losers, who are the vast majority, defensively tend to be self-disparaging, apprehensive about evaluation, and tend to withdraw psychologically and physically. Within individualistic situations, students are isolated from one another, receive little direct comparison with or feedback from peers, and perceive evaluations as inaccurate and unrealistic. A defensive avoidance, evaluation apprehension, and distrust of peers results. Within cooperative situations, individuals tend to interact, promote each other's success, form multidimensional and realistic impressions of each other's competencies, and give accurate feedback. Such interaction tends to promote a basic acceptance of oneself as a competent person.

Understanding Interdependence

Cooperative learning simultaneously models interdependence and provides students with the experiences they need to understand the nature of cooperation (Johnson-& Johnson, 1989a). The future of the world depends on the constructive and competent management of world interdependence as well as interdependence in family, work, community, and societal environments. Students who have had 12-20 years of cooperative learning and who have had opportunities to work cooperatively with students who vary in ability, ethnicity, gender, and so forth will be better able to build positively interdependent relationships than will students who have had 12-20 years of competitive and individualistic learning.

Figure 1. Outcomes of cooperation

RELATIONSHIPS AMONG OUTCOMES

There are bi-directional relationships, as shown in Figure 1, among achievement, quality of interpersonal relationships, and psychological health (Johnson & Johnson, 1989b). Each influences the others. Caring and committed friendships come from a sense of mutual accomplishment, mutual pride in joint work, and the bonding that results from joint efforts.

The more students care about each other, the harder they will work to achieve mutual learning goals. Long-term and persistent efforts to achieve do not come from the head; they come from the heart (Johnson & Johnson, 1989b). Individuals seek out opportunities to work with those they care about. As caring increases, so do feelings of personal responsibility to do one's share of the work, a willingness to take on difficult tasks, motivation and persistence in working toward goal achievement, and a willing-ness to endure pain and frustration on behalf of the group. All these contribute to group productivity.

In addition, the joint success experienced in working together to get the job done enhances social competencies, self-esteem, and general psychological health. The more psychologically healthy individuals are, the better able they are to work with others to achieve mutual goals. Joint efforts require coordination, effective communication, leadership, and

conflict management. States of depression, anxiety, guilt, shame, and anger decrease the energy available to contribute to a cooperative effort.

Finally, the more positive interpersonal relationships are, the greater the psychological health of the individuals involved- Through the internalization of positive relationships, direct social *support*, shared intimacy, and *expressions* of caring, psychological health and the ability to cope with stress are built. Destructive relationships and the absence of caring and committed relationships tend to increase psychological pathology, Moreover, depression, anxiety, guilt, shame, and anger decrease an individual's ability to build and maintain caring and committed relationships. The more psychologically healthy individuals are, the more they can build and maintain meaningful and caring relationships.

With the amount of research evidence available, it is surprising that classroom practice is so oriented toward individualistic and competitive learning *and* schools are so dominated by a competitive/individualistic structure. It is time for the discrepancy to be reduced between what research indicates is effective in teaching and what teachers actually do.

BACK TO THE BASICS

Our research and the research of many others dating back to the late 1800s has established that having students work together cooperatively is a powerful way for them to learn and has positive effects on the classroom and school climate This has been verified by teachers in classrooms from preschool through graduate school. However, the importance of emphasizing cooperative learning in classrooms goes beyond just achievement, positive relationships, and psychological health.

The ability of all students to learn to work cooperatively with others is the keystone to building and maintaining stable marriages, families, careers, and friendships. Being able to perform technical skills, such as reading, speaking, listening, writing, computing, and problem solving, are valuable but of little use if the person cannot apply those skills in cooperative interaction with other people in career, family, and community environments. The most logical way to emphasize the use of students' knowledge and skills within a cooperative framework, such as they will meet as members of society, is to spend much of the time learning those skills in cooperative relationships with each other. We need to get back to the basics, reconcile school practices with current research, and encourage that a healthy portion of instruction is cooperative.

REFERENCES

Bahn, C. (1964). *The interaction of creativity and social facilitation in creative problem solving.* Doctoral dissertation. Columbia University, Ann Arbor, MI. (University Microfilms No- 65-7499)

Bolen, L., & Torrance, E. (1976, April). *An experimental study of the* influence of locus of *control, dyadic interaction, and* sex on *creative thinking.* Paper presented at the American Educational Research Association, San Francisco.

Deutach, M. (1949). A theory of cooperation and competition. *Human Relations,* 2,129-152.

Dunnette, M~, Campbell, J., & Jaastad, K. (1963). The effect of group participation on brainstorming effectiveness of two industrial samples. *Journal of Applied Psychology, 47,* 30-87.

Falk, ID., & Johnson, D.W. (1977). The effects of perspective-taking and ego-centrism on problem solving in heterogeneous and homogeneous groups. *Journal of Social Psychology, 102,* 63-72.

Harkins, S., & Petty, H. (1982). The effects of task difficulty and task uniqueness on social loafing. *Journal of Personality and Social Psychology, 43,*1214-1229.

Hwong, N., Caswell, A., Johnson, D.W., & Johnson, H. (1993). Effects of cooperative and individualistic learning on prospective elementary teachers' music achievement and attitudes. *Journal of Social Psychology, 133(1),* 58-64.

lngham, A., Levinger, C., Craves, A., & Peckham, V. (1974). The Ringelmann effect: Studies of group size and group performance. *Journal of Personality and Social Psychology, 10,* 371- 384.

Johnson, D.W. (1990). *Reaching out: Interpersonal* effectiveness *and self- actualization* (4th ed.). Englewood Cliffs, NJ: Prentice Hall.

Johnson, D.W. (1991). *Human relations and your career* (3rd ed.). Englewood Cliffs, NJ: Prentice Hall.

Johnson, D.W., & Johnson, F. (1991). *Joining together: Group theory and group skills* (4th ed.). Englewood Cliffs, NJ: Prentice Hall.

Johnson, D.W., & Johnson, R. (1974). Instructional goal structure: Cooperative, competitive, or individualistic. *Review of Educational Research, 44,*213-240.

Johnson, 11W., & Johnson, R. (1978). Cooperative, competitive, and individualistic learning *Journal of Research and Development in Education, 12,* 8 -15.

Johnson, D.W., & Johnson, H. (1983). The socialization and achievement crisis: Are cooperative learning experiences the solution In L. Hickman (Ed.), *Applied social psychology annual 4* (pp. 119-164). Beverly Hills: Sage Publications.

Johnson DXV., & Johnson, R. (1989a). *Cooperation and competition: Theory and research.* Edina, MN: interaction Book Company.

Johnson, DXV., & Johnson, H. (1989b). *Leading the cooperative school.* Edina, MN: Interaction Book Company.

Johnson, D.W., & Johnson H. (1991). *Learning together and alone: Cooperation, competition, and individualization* (3rd ed.). Engkwood Cliffs, NJ: Prentice Hall.

Johnson, D.W., Johnson, H., & Maruyama, ((1983). Interdependence and interpersonal attraction among heterogeneous and homogeneous individuals: A theoretical formulation and a meta-analysis of the research. *Review of Educational Research, 53,* 5-54.

Johnson, **D.W.,** Johnson, R., Ortiz, A., & Stanne, M. (1991). Impact of positive goal and resource interdependence on achievement, interaction, and attitudes. *Journal of General Psychology, 118(4),* 341-347.

Johnson, UW., Johnson, H., Stanne, M,, & Garibaldi, A. (1990). Impact of group processing on achievement in cooperative groups. *Journal of Social Psychology, 130,* 507-516.

Johnson, D.W., Maruyama, C., Johnson, R., Nelson, D., *& Skon, L.* (1981). Effects of cooperative, competitive, and individualistic goal structures on achievement: A meta-analysis. *Psychological Bulletin, 89,* 47-62.

Kerr, N., & Bruon, 5. (1931). Ringelmann revisited: Alternative explanations for the social loafing effect. *Personality and Social Psychology Bulletin,* 7, 224-281.

Latane, B,, Williams, K., & 1-larkins, S. (1979). Many hands make light work: The causes and consequences of social loafing. *Journal of Personality and Social Psychology, 37,* 822-882.

Lew, M., Mesch, ID., Johnson, D.W., & Johnson, H. (1986a). Components of cooperative learning: Effects of collaborative skills and academic group contingencies on achievement and mainstreaming. *Contemporary Educational Psychology, 11,* 229-239.

Lew, M., Mesch, U., Johnson, D.W., & Johnson, H. (1986b). Positive interdependence, academic and collaborative-skills group contingencies and isolated students. *American Educational Research Journal, 23,* 476-488.

Lewin, K. (1935). *A dynamic theory of personality.* New York: McGraw-Hill.

Mayer, A. (1908). Uber einzel und gesamtleistung des schul kindes. [About individual and overall achievement of school children]. *Arc/tic for die Gesamte Psychologie, 1,* 276-418

Mesch, U., Johnson, D,W., & Johnson, R. (1988). Impact of positive interdependence and academic group contingencies on achievement. *Journal of Social Psychology, 28,* 845-852.

Meach, U., Lew, M., Johnson, 11W., & Johnson H. (1986). Isolated teenagers, cooperative learning and the training of social skills. *Journal of Psychology, 120,* 328-334.

Moede, W. (1927). Die richtlinien der leistungs psychologie (Guidelines for the psychology of performance]. *lad ustrielle Psychotechnik, 4,* 198-207.

Montagu, A. (1965). *The human revolution.* New York: World Pub Co.

Pepitone, E. (1980). *Children in cooperation and competition.* Lexington, MA: Lexington Books.

Peters, H., & Thrrance, E. (1972). Dyadic interaction of preschool children and performance on a construction task. *Psychological Reports, 30,*747-750.

Petty, H., Harkins, S., Williams, K., & Latane, B. (1977). The effects of group size on cognitive effort and evaluation. *Personality and Social Psychology Bulletin, 3,* 575-578.

Rosenshine, B., & Stevens, B. (1986). Teaching functions. In M. Wittrock (Ed.), *Handbook of research on teaching* (3rd ed.) (pp. 376-391). New York: Macmillan.

Sharan, S. (1980). Cooperative learning in teams: Recent methods and effects on achievement, attitudes, and ethnic relations. *Review of Educational Research, 50,* 241-272.

Slavin, R. (1988). *Cooperative learning.* New York: Longraan.

Thrrance, E. (1970). Influence of dyadic interaction on creative functioning. *Psychological Reports,26,* 891-394.

Torrance, E. (1971). Stimulation, enjoyment and originality in dyadic creativity. *Journal of Educational Psychology, 62,* 45-48.

'Ibrrance, E. (1978, February). *Dyadic interaction in creative thinking and problem solving.* Paper presented at the American Educational Research Association annual meeting, New Orleans.

Triandis, H., Bass, A., Ewen, H., & Mikesell, E. (1963). 'Teaching creativity as a function of the creativity of the members. *Journal of Applied Psychology, 47,* 104-110.

Triplett, N. (1898). The dynamogenic factors in peacemaking and competition. *American Journal of Psychology, 9,* 507-533.

Vygotsky, L. (1962). *Thought and language.* Cambridge, MA: MIT Press.

Williams, K. (1981). *The effects of group cohesiveness on social loafing.* Paper presented at the annual meeting of the Midwestern Psychological Association, Detroit.

Williams, K., Harkins, S., & Latane, B. (1981). Identifiability as a deterrent to social loafing:

Two cheering experiments. *Journal of Personality and Social Psychology, 40,* 303-311.

Cooperative Learning and Inclusion

Mara Sapon-Shevin, Barbara J. Ayres, and Janet Duncan

As schools move closer to the goal of providing education for all children within inclusive classrooms and schools, increasing amounts of attention and energy are being devoted to developing pedagogical approaches that are appropriate in heterogeneous classrooms. It has become clear that physical inclusion of students with disabilities in the classroom is not sufficient to ensure they will develop meaningful relationships with others. Teachers must structure the educational and social environment so that students develop the skills and attitudes required to interact across perceived differences and disabilities. Teachers who are working in inclusive classrooms are eager to develop modes of instruction that do not isolate and stigmatize learners with different needs: "Everyone write your book reports, and Michael, come over here and draw a picture" is an approach that not only separates children unnecessarily, but also denies all children the opportunity to learn and interact with others in ways that will enhance their academic and social growth. The realization that complete individualization is not a practical or even desirable solution to meeting the diverse needs of children within a single classroom has led many inclusion advocates to promote cooperative learning as the pedagogy of choice.

One of the principles of cooperative learning is the principle of heterogeneous grouping. Cooperative learning advocates support the idea that diversity is something to be worked with, not negotiated around, and that the richness of the educational experience is improved for all students when they are active participants in a mutually supportive environment.

Cooperative learning has been used extensively within "regular education" classrooms and "special education" classrooms, but because "inclusive classrooms" are a relatively recent phenomenon, there has not been extensive documentation of the use of cooperative learning strategies within classrooms that serve a range of students within the same environment. Many of those who teach about and promote cooperative learning are also products of and still work within an educational system that segregates and tracks students by ability and prepares teachers for this dual system; therefore, they may still identify themselves as "regular education teachers" or "special education teachers."

Putting the principles of cooperative learning together with the principles of inclusion involves extending the concept of heterogeneous grouping beyond more common notions of children who read at different levels or are at different math skill levels to thinking about and planning for students whose disabilities are more extensive (Sapon-Shevin, 1990, 1991). This chapter addresses the principles of planning for, implementing, and evaluating cooperative learning within inclusive classrooms that serve all students within a common framework. Sharing students' labels does little to help us plan for them educationally; educational programming is maximized by looking at students' abilities and gifts and by describing their educational needs in descriptive rather than evaluative ways. However, because many children are currently labeled (e.g., "severely handicapped," "cognitively delayed," "physically handicapped") and we do believe that children with labels should be and can be included in cooperative learning activities, we identify children's specific

educational and physical limitations and needs so that it is clear to the reader that we are, in fact, talking about all children.

This chapter begins with the presentation of three beliefs about cooperative learning. We then explore some principles of cooperative learning that must be implemented in order to maximize academic and social goals for all students. Finally, we discuss the application of cooperative learning beliefs and principles.

In keeping with the content and philosophy of this book, this chapter was written cooperatively by the three authors, who combined their knowledge and energy to produce something better than any one could have accomplished alone.

A special thank you is extended to the teachers who participated in the summer course in language arts held at Acadia University, Wolfville, Nova Scotia, during July and August 1992.

RELIEFS ABOUT COOPERATIVE LEARNING

In writing this chapter we were guided by three beliefs about the importance of cooperative learning and inclusion: 1) it benefits all students, 2) it is an integral part of current school reform efforts, and 3) it promotes collaboration between educators who have traditionally worked in isolation from others.

Cooperative Learning Is Good for All Students

Cooperative learning makes sense in inclusive classrooms because it builds upon heterogeneity and formalizes and encourages peer support and connection. However, cooperative learning is not of value only to children with disabilities. Cooperative learning is of value for all students including those who have been identified as "at risk," "bilingual," "gifted," and "normal." *All* students need to learn and work in environments where their individual strengths are recognized and individual needs are addressed. *All* students need to learn within a supportive community in order to feel safe enough to take risks.

Some educators have challenged the use of cooperative learning in classrooms with students who are identified as "gifted," claiming that gifted students become permanent tutors and are resentful of having to work with students of differing abilities (Matthews, 1992). Such arguments must be examined critically; we must ask ourselves what we want students to learn in school. Beyond academic subjects, don't we want all students to be comfortable with and accepting of individual differences (their own and others) Don't we want all students to have sophisticated social skills that will enable them to work with people they perceive as "different" or even "difficult"? Furthermore, don't we want to model inclusion and community and demonstrate in the microcosm of the classroom what a society in which all people are valued would look like?

One student we know who was initially resistant to group work commented "What I like best about this class is that everyone cooperates and shares" (Ayres, O'Brien, & Rogers, 1992, p. 26). Surely this is an important lesson for all students to learn, not just students with disabilities. Another student said, "Sometimes I can't understand Jingyu -- it's kind of hard to understand him but he can read pretty good. He, urn, like on math problems", people say, "Why don't you help Jingyu?", but sometimes he helps us. He is good at his math" (Ayres & Carnicelli, in preparation). Thoughtfully implemented cooperative learning disrupts typical hierarchies of who is "smart" and who is not, and allows all students to work together, each student experiencing the role of teacher and of learner.

If teachers or students are uncomfortable with cooperative learning, it is often because they have adopted a technique without a firm understanding of the underlying principles and without sufficient support to implement creative, multilevel cooperative learning activities. Teachers must be encouraged to be thoughtful about all aspects of cooperative learning (Sapon-Shevin & Schniedewind, 1989/1990) and to garner enough support for themselves so that they are not isolated and overwhelmed by the truly complex task of meeting the needs of many different children within the same environment.

Cooperative Learning Is Part of Comprehensive School Reform

Teachers are confronted on a regular basis with educational innovations that must be incorporated into their teaching: whole language, critical thinking, authentic assessment, and so forth. Some teachers (and administrators) hope they can ignore these "fads" in education, and, by waiting for them to pass and be replaced by "the next thing," save themselves the time and energy needed to learn about and implement new practices. Yet, not only is cooperative learning supported by a compelling research base, it is also fully compatible with other "best practices" currently being promoted.

Whole language, which involves having students read literature and write stories, has been implemented very

successfully in cooperative groups, and many of the practices promoted by whole language experts are inherently cooperative (e.g., editing conferences, book sharing, collaborative writing). One teacher, for example, had

lug each student in the class write an "I like" book; some of the students wrote long narratives—"l like walking in the rain in my new boots"—whereas others cut out pictures of things they liked and pasted them in the book. Every child was able to complete a book, engaging in the literacy activity. Every child was able to partner with another and share his or her book by "reading" it to an attentive listener. In contrast to grouping children into homogeneous reading groups by skill, this activity was structured in heterogeneous cooperative groups so that all children could succeed at their own level.

Important skills such as critical thinking, creative problem solving, and the synthesis of knowledge can easily be accomplished through cooperative group activities in inclusive classrooms. In addition, authentic assessment (anecdotal reporting, portfolio assessment, and observational recording) is fully compatible with cooperative learning and inclusion.

Teachers need not envision cooperative learning as "one more thing" they need to do, but rather as an organizing value and principle for all the instruction in their classroom. Building a cooperative, inclusive classroom community can be the framework within which other teaching strategies and practices are woven.

Cooperative Learning Means Teachers Cooperating

In order for cooperative learning to be successful in inclusive classrooms; teachers who have traditionally worked in isolation will need to find new ways of collaborating and sharing their expertise. This kind of collaboration can be challenging because it involves sharing responsibilities and communicating with others, but it can also be exciting and rewarding. One teacher commented that planning cooperative learning lessons was stimulating: "For us, it really gets the creative juices flowing." Another teacher said, "It's fun, there are no two ways about it, it's fun. How can it not be fun? Plus [the students] get to know each other’s abilities and they can get excited about each other's growth, even though it’s not the same as theirs" (Ares et al., 1992, pp. 25, 26).

Not only can students get to know each other's abilities within a cooperative process, but teachers can as well. A general education teacher and a special education teacher planning together often find that they have unique skills and ideas to contribute to the process. The general education teacher may have a broader perspective on the curriculum and on curriculum integration, whereas the special education teacher may have special skills in modifying instruction and developing adaptations that benefit many children. General education teachers who are used to working with larger groups of children often can contribute important classroom management and organizational strategies to balance some of the individualized approaches proposed by the special education teacher.

It is often acknowledged that when students are learning to work in groups they need support and encouragement to get them over the rough spots. "I don't want to work with Pam," or "Danny's taking over the whole project" are indications that time and attention must be devoted to developing appropriate social skills for negotiating conflict and moving toward consensus. Similarly, teachers learning to work together may encounter struggles over turf, expertise, ownership, and responsibility—these also need to be negotiated. Teachers must find ways to support one another as they learn to be cooperative, inclusive educators at the same time they support their students in this goal. Learning how to use the expertise of the speech therapist or physical therapist, for example, or how to balance a child's individualized education program (IEP) objectives with broader classroom objectives requires time for teachers to meet, talk, listen, plan, and develop a trusting working relationship. Implementing cooperative learning in inclusive classrooms can benefit not only the students, but also provide an important opportunity for educators to develop their own teaching skills. Supportive administrators have found creative ways of providing teachers with adequate planning and preparation time so that inclusion becomes an opportunity for better teaching rather than an imposed burden.

PRINCIPLES OF INCLUSIVE COOPERATIVE LEARNING

Once teachers have decided that they will begin to implement formal cooperative group lessons in their classrooms, there are many decisions that must be made. Teachers must decide how they will incorporate cooperative learning lessons within their classroom structure, how they will decide the content to be taught using cooperative learning, how they will form groups, how they will ensure active participation for all students, and how they will evaluate students' learning. On the following pages we explore some principles of inclusive cooperative learning that must be taken into consideration for successful implementation.

Cooperative Learning Means

Establishing a Cooperative Classroom Ethic

For cooperative learning to be maximally effective, it must take place within an overall context of cooperation and peer support. Attempts to implement cooperative learning activities when the classroom norms are those of isolation, competition, or interpersonal indifference are apt to result in contradictory messages to students and have limited positive impact on the goal of creating a safe, inclusive community.

Creating a safe, caring community for all students within which cooperative learning is simply the formalized expression of classroom values and orientations involves attention to overall community and connections, open communication about differences and classroom practices, and helping.

Overall Community and Connections Cooperative learning should not be something that is done on Tuesdays and Thursdays from 9 to 10, nor should it be something we do only when we have children with disabilities included. For example, in one school, a sign on a wall announced "Cooperative Learning, May 14th." When a visitor inquired about the sign, she was told, "That's the day the trainable mentally retarded students go into the third grade classroom to work."

A feeling of cooperation, community, and connection should be part of everything that happens in the classroom. For example, hanging up for display only those papers graded with "A"s communicates to students that not everyone's work is valued. Teachers might instead want to hang up a "proud paper" from every student or let students decide what they would like to display. Having students line up for music and gym in a girls' line and a boys' line communicates that gender divisions are important ones (and pity the boy who accidentally gets in the girls' line). There are an infinite number of other ways to line students up that encourage them to interact with a variety of their classmates across boundaries of race, gender, and ability. Behavior management strategies that single students out for praise or punishment (names on the board, statements such as "I like the way Nicole is sitting") must be challenged with reference to how such practices affect the way students look at one another and their differences. Classroom holiday celebrations, posters on the wall, and the racial and ethnic representation of the books in the classroom library all affect the school community and the extent to which students feel that they are (or are not) a valued part of the classroom. Teachers must be encouraged to think about all aspects of their classroom practice in reference to questions such as the following:

Will this practice contribute to or detract from a sense of classroom community? Will what I say or do in this situation encourage students to see each other positively or negatively?

Open Communication About Differences and Classroom Practices Ct-eating a classroom community in which all students feel comfortable and supported in their learning requires that teachers deal directly with issues that affect the classroom. When a child in the classroom is displaying some challenging behavior, for example, other students are generally aware of this. Not talking about the situation and exploring various solutions with students may leave them frightened or disenfranchised, wondering why something so obvious is not being discussed and what their role in the classroom should be. Teachers certainly need to be thoughtful about how and when they talk to students about Mark's biting or the fact that LeAnn is being teased on the playground because she smells. However, ignoring such issues in the hope that they will "work themselves out" often results not only in escalation of the problem but a classroom atmosphere in which students do not feel empowered to talk about what is happening or to explore their role in generating and implementing solutions.

In Johnson City, New York (Salisbury, Palombaro, & Hollowood, 1993), students and teachers employ a collaborative problem-solving process in which they identify issues, generate possible solutions, screen solutions for feasibility, choose a solution to implement, and then evaluate it. Teachers have used this system to address barriers to inclusion at multiple levels: physical (How can Marie be involved in the puppet show her group has written when she cannot stand up and hold her puppet at the same time?), social (What might Taylor be trying to communicate when he pulls hair?), and instructional (What are some ways we can help Luis, who has a hearing impairment, learn to count?). Including children in identifying problems and generating and implementing solutions sends the clear message that we can talk about what is happening in our classroom, and, as a group, we can figure out ways to do things so that everyone is included.

Similarly, teachers who implement more formal cooperative learning strategies should also talk to students about why they are doing so, what they hope to accomplish, and what some of the barriers might be. Students who are involved in the process of cooperative learning, as opposed to those who are simply doing what the teacher told them to, are far more likely to take ownership of cooperative activities and generalize them to other areas of classroom and home life.

Helping Establishing norms about when, how, and why we help others is critical to the full implementation of cooperative learning. Because many teachers and students have received cultural messages that say that "needing help is bad or shameful" and "offering help to others will embarrass them," it is important to establish new classroom norms.

Two of the most critical values are: 1) Everyone is good at something and can help others, and 2) Everyone is entitled to and can benefit from help and support from others. Teachers may want to help students structure a "Classroom Classifieds" in which students identify their own strengths and skills and name these as "Help Offered" (can help with multiplication, good at jumping rope, can teach sign language, know a lot about frogs). Concurrently, they can identify their needs and learning goals and identify these as "Help Wanted" (want to learn to make friendship bracelets, need help with spelling, want to learn how to play ball games at recess). It is important that such activities be structured so that every child is both a teacher and a learner, as a *way* of challenging rigid notions that there are some people who give help and some people who need help. It is important to create a classroom space for people to proudly claim what they are good at and safely ask for the help and support they need without fear or embarrassment, humiliation, or isolation. When fourth grade teacher Cathleen Corrigan implemented this activity in her inclusive fourth grade class, she found that many of the students had difficulty identifying something they were good at. She observed that when students announced that "they weren't good at anything," other students jumped in to remind them about their strengths ("You're really good at the computer," "You're a good artist.").

Cooperative Learning Facilitates Teaching Meaningful Content

Unfortunately, neither deciding to have an inclusive classroom nor implementing cooperative learning guarantees that the curriculum will be creative or meaningful. Teachers who feel constrained by or limited to a fixed curriculum or set of materials often try to "bend" the child to fit the curriculum, and we have seen cooperative learning used to encourage children to complete unimaginative worksheets and dittos.

Including a child with a significant disability in an activity and structuring that activity cooperatively gives us an opportunity (and sometimes forces us) to examine the curriculum critically and unleash our creative pedagogical and curricular inventiveness. Not only is memorizing the states and their capitals an inappropriate curriculum objective for Manuel, but neither is it the best way to teach map skills and geography to other students. Combining a commitment to inclusion with an orientation toward cooperative learning can be a catalyst for thinking carefully about the following questions; What is really important for students to learn? How can I make learning meaningful and functional for all students?

One of the often unexpected but welcome benefits of including children with

specific behavioral and educational challenges in the classroom is that teachers are encouraged to rethink previous beliefs and practices related to the curriculum and pedagogy. The teacher who decides to use manipulatives for math (instead of worksheets) because one child quite clearly requires that approach often finds that many other students also benefit from this hands-on, participatory approach. Teachers who move away from text-based question-and-answer approaches to teaching in order to accommodate students who require more active involvement in the curriculum are generally pleased to find that such an orientation is of benefit to *all* students.

Cooperative learning in inclusive classrooms will be more effective when it is multilevel, multimodal, and integrated across subject areas. Multilevel teaching involves students working on similar objectives or with the same material, but at different levels. All students may be using the telephone book, for example, but some students might be learning to dial 911 in case of an emergency while others learn to compute and compare long distance charges and optimum calling times. Or, all students may be working on map skills, but at different levels. Perhaps Maria is learning about lines of latitude and longitude while Robin is learning the directions "up" and "down," "left" and "right."

Multimodality teaching involves moving away from pencil and paper tasks to other forms of active involvement. Writing and performing a puppet show, for example, might involve writing, reading, building a set, singing, cutting, talking, dancing, and so forth. An activity like a puppet show or a unit on space can also be used to integrate curriculum across subject matter. When one class studied the moon, for example, they incorporated science (facts about the moon and astronomy), creative writing (poems and stories about the moon), social studies (cross-cultural beliefs and traditions around the moon), math (computing distance, density, air pressure), and much more. Broadening the curriculum in these ways provides many opportunities both to include students who work at significantly different levels and to design cooperative learning activities in which students can help and support one another in their learning while still maintaining a common theme and a sense of community.

Cooperative Learning Depends

on Supportive Heterogeneous Groups

In classrooms where teachers are working to communicate norms of cooperation, students can work together in a number of different ways. In many cooperative classrooms, students sit in heterogeneous base groups so that teachers can structure both informal and formal opportunities for cooperation between students throughout the day. For example,

students can start their day with an informal group activity at their desk clusters; complete class jobs with a partner from their group; and engage in formal, structured cooperative learning activities with group members. In most classrooms, teachers leave cooperative learning groups together for 1 month or 6 weeks so that students have an opportunity to get to know and work together with group members, but then also have an opportunity to learn to work with other classmates throughout the year. The goal is for students to have worked in cooperative groups with all their classmates by the end of the year.

One important aspect of creating cooperative learning groups is maximizing the heterogeneity of the students within the small groups. Students should be placed in groups that are mixed by academic skills, social skills, personality, race, and sex. It is often helpful for teachers to work with others who are familiar with their students when groups are being formed. With all of the different aspects of student diversity that need to be taken into consideration, forming groups can seem like an onerous task that will be too difficult for any one person.

Many teachers structure cooperative groups very deliberately. In classrooms where students are functioning at different levels in regard to academic and social abilities, it is important that the teacher structures the groups to ensure heterogeneity, particularly in the beginning of the year or when new students enter.

Two first grade teachers who team teach in a classroom that includes the full range of learners work together to plan cooperative learning groups. They begin the process by identifying one aspect of student diversity and placing one student with this quality in each group. For example, they start with academic diversity and place one student in each group who is able to read. Next they look at the students who are nonreaders and place them into groups. As they place this second student they always consider how this student and the first student match up in regard to supporting one another socially. For the third student in each group they also consider social aspects—they look for a student who can complement the other two students and help pull the group together. One day their discussion when forming groups went as follows:

> This is a nice combination but Katie and Andrew are both quiet. I was thinking about
>
> Rachel and Katie because of Rachel's style--she may be more assertive with Katie to
>
> help stimulate her involvement. (Ayres et al., 1992, p. 6)
>
> What about Doug and Brent? I'm thinking of this because of Doug's abilities. In many ways Brent is similar but it may build some self-esteem for Brent in that setting. He can really do things but he doesn't think he can do as much as he can. (p. 6)
>
> Maybe Madeline should be with Brad because she is so strong in everything—and in that group it is going to take a little more work from two people instead of three Plus, she is comfortable with Brad and I think she will come up with strategies to involve him -- she is real bright and she is good at modifying things. This group is going to have to be able to change and not have to be doing exactly what every other group is doing, and not get upset about it. (p. 6)

The comments made by these teachers illustrate the level of complexity of thought that goes into structuring supportive heterogeneous groups. Through careful planning, students have a greater opportunity to receive the social support that is important for establishing a sense of belonging and group membership in the classroom.

In forming groups, some teachers focus on student choice, asking students who they would *like* to work with. Although it makes sense for teachers to provide students with multiple opportunities to choose within the school day, student choice may not be the best way to form groups. When students choose their own groups and work only with others they already know, the groups often tend to be same gender, race, and ability. These more homogeneous groups work against the broader goals of cooperative learning in which teachers are striving to help the students learn to value the diversity that exists in the classroom and in society.

There are ways, however, that teachers can incorporate some aspects of student choice into group formation. For example, Deborah Quick, a fourth grade teacher, forms new groups periodically throughout the year and asks each student to respond (privately) to a number of questions including: "Who are two people you think you could work well with?", "Who are two people you don't know well and would like to know?" By asking students these questions, she is allowing them to participate in group formation, but also emphasizing that although it is important to work with students they already know, it is also important to learn to accept, value, and work with others they do not know well yet. Once students have learned to work with many others, allowing more choice in group formation may ho appropriate.

Cooperative Learning Requires Structures

that Ensure the Active Participation of All Students

Equally important to establishing supportive heterogeneous groups is ensuring the active participation of all students within inclusive cooperative learning lessons. All too often students are placed into groups and given a task to complete without the provision of structures that will promote the active, equitable participation of all members. Key components of participation include the division of labor and materials, flexible interpretation of roles, and individualized student responsibilities.

Division of Labor and Materials The participation of all group members is more likely when teachers carefully structure the cooperative group task. Through the division of labor and materials, the students are given a clear message that each student has an important contribution to make toward the completion of the group's task. In the beginning, or when new groups have formed, it is important that teachers structure this interdependence among the group members. Planning for equitable participation becomes especially important in inclusive classrooms where the participation of some students may be dependent on the structure that is provided. For example, with a student who is reserved and responds more slowly than her classmates due to a physical disability, if labor and materials are not divided it is possible that group members will do the task for her. As was mentioned previously in this chapter, it is also important for teachers to talk with students about the goals of working together and the importance of everyone contributing In one classroom, the teacher talked to individual groups and asked the students how they were going to make sure that all group members were given a turn.

Flexible Interpretation of Roles lb promote active, equitable participation within groups, roles must be interpreted flexibly. Instead of creating static roles for students, flexible roles allow for the individualization that will ensure that all group members are able to assume each role at some point in time. For example, in one classroom, the roles remained the same across time (e.g., writer, reader/questioner, checker), but the responsibilities of the roles changed depending on the task and the students who would be given the role on that particular day (Ayres et al., 1992). Through these flexible roles, a student who is unable to write the letters of the alphabet could be the writer when the task is designed so that the writers are gluing something instead of writing words. Another aspect of individualizing roles occurs when teachers think of creative ways for students to fulfill the role responsibilities. Teachers might ask themselves, "What are the different ways that students could encourage group members for this lesson?" or "flow could Rachel, who doesn't speak, encourage others?" When teachers work to broaden their thinking about the equitable participation of students, they can come up with many different ways for students to be active contributors (e.g., encourage others by giving a "high five," passing a card with a positive statement or a smiley face written on it to a group member).

Individualized Student Responsibilities Adaptations can be made within groups to promote the active, equitable participation of all members. Sometimes adaptations are necessary to promote the participation of an individual student. For example, in Mary Rita Carnicelli's classroom, heterogeneous cooperative learning groups worked together on math story problems. One student, Kris, whose goals for math included writing numbers from 1 to 50 and using a calculator to compute problems, was given the role of writer/checker within her group. The other students in the group determined what mathematical function to use for the problem, helped Kris write down the problem on the worksheet by dictating the numbers, solved the problem, and dictated to Kris the numbers to write down for the answer. Kris was then responsible for checking the group's response on her calculator. In another classroom, Brad was a first grade student whose educational objectives include grasping and holding objects and indicating his preference by choosing between two objects. During a lesson on community helpers, Brad's group was given the role of a doctor to study so that he would be able to use a play doctor's kit to learn about medic-al instruments. The addition of the hands-on materials provided an opportunity to address his educational objectives of grasping objects and indicating preference (Ayres et a]., 1992).

When students are placed in supportive heterogeneous groups and issues of active, equitable participation are addressed by teachers, all students can benefit from the use of cooperative learning in the classroom. Through these considerations and individualized adaptations, all students are seen as important group members in the eyes of their peers. Although these components initially require more thought and time on the part of teachers, they will reap the rewards as students begin to support and expect the maximum involvement of all group members.

Cooperative Learning Provides Opportunities for Ongoing Evaluation

One important and often complex aspect of instruction with cooperative learning is evaluation. How can educators be certain that students are attaining their educational goals within cooperative groups? How should students be evaluated and how should that evaluation be communicated? How can an evaluation system help modify and refine cooperative learning instructional programs? These questions can guide educators as they work to design appropriate evaluation methods for cooperative learning activities. Effective evaluation of cooperative learning in inclusive classrooms must focus on both the content and the process of the group experience.

The issue of grading in inclusive cooperative classrooms is difficult. Educators who are concerned about the self-esteem of all learners reject the use of practices that promote competition between students. Group grades or group rankings

work against encouraging cooperation among students and may make group members less willing to support a classmate with a disability. Evaluation should not be structured so that one student's difficulty becomes a group's liability or the cause (real or perceived) of group failure. It is imperative to avoid situations in which students can accurately report that "Tyrone brought our grade down." Teachers must be careful that the structure of group evaluation accounts for differing abilities.

In inclusive cooperative classrooms, teacher-made tests of subject matter or standardized tests with norm-referenced criteria may not be sufficient or appropriate for assessing achievement. The students who have IEPs may be working at different levels than their peers, a modification we wish to encourage, rather than discourage, through excessive standardization. Separating students into fixed ability groups that are evaluated through a variety of criterion-referenced tests is not the solution either, particularly as such a process tends to isolate and stigmatize individuals ("You're only on the red book.").

Teachers must find ways to assess students who are engaging in significantly different activities within a common structure and begin to describe and evaluate what students have learned and how they are working with their peers. Cooperative learning provides an opportunity for students to complete an activity with an emphasis on group dynamics and interpersonal skills as well as the academic goals of the lesson. Cooperative learning also allows for ongoing evaluation on the part of students and teachers, both during and after group activities.

If we intend to evaluate students on their group process and product, it is crucial that cooperative learning lessons are designed to be just that—cooperative. This can be accomplished through the creation of activities that incorporate many of the principles presented in this chapter, including teaching meaningful content, creating supportive heterogeneous groups, and using structures that ensure the active -participation of all students. Many different types of activities are appropriate for the evaluation of students who are working in cooperative groups. Dippong (1992) advocates for evaluation through activities such as group reports, problem solving, seminars and debates, and simulations and role-plays.

In inclusive cooperative classrooms, teachers may want to assess individual as well as group effort and, perhaps, grade students on individual goals and/or on the basis of improvement. Individual goals can be both academically oriented and social skill related. For example, one of Martin's objectives might be to say encouraging things to his classmates during the group lesson; Kara's objectives might relate to her writing skills or organizational leadership.

During cooperative learning activities both teachers and students can assume responsibility for evaluating the skills and contributions of group members. While students are engaging in group activities, educators often collect and share information on how groups are functioning in regard to the academic and social aspects of the lesson. This information is shared with groups both during and after the lesson. Direct observation is a valuable tool for teachers who are concerned about a student's performance in a specific area. For example, do all group members have a chance to talk, including the child who uses an alternative communication device? If not, equitable participation can be addressed with this group at the time they most need the feedback -- when they are working together to complete a task. In addition, as part of cooperative learning lessons, students are often asked to discuss bow they worked together to accomplish the task. This information is shared within small groups and then with the entire class. An important part of cooperative learning includes the instruction of students in how to observe, evaluate, and provide feedback to group members in positive ways. Peer evaluation affords students a chance to appreciate and critique the efforts of their peers with the group project in mind. Self-evaluation can also be a part of cooperative learning activities in which students set their own goals and share them with group members.

There are several strategies that can be used to provide a more comprehensive examination of progress within cooperative learning activities (see CulIen & Pratt, 1992). The following methods are more qualitative in nature and provide rich information about students that could not be ascertained as readily through traditional testing. For example, some teachers use a cumulative record file review system that outlines teachers' comments in subject areas, patterns of strengths as well as areas that need improvement, and affective observations. This information includes observations of students in cooperative learning groups and comments about their growth in academic and social skills. Other teachers collect both individual and group work in portfolios that can be reviewed by teachers, parents, and students on a periodic basis. The student—teacher interview is another option. Through interviews the teacher can glean much information about students' interests, motivation, knowledge, and perspectives on their contribution to the group. All of these approaches are compatible with cooperative learning and the use of authentic assessment, which is gaining attention as an important approach to determining whether students have acquired skills to select and use important concepts in authentic open-ended situations (Hibbard, 1992).

Cooperative learning activities provide a unique opportunity to evaluate important collaborative outcomes, such as interactive communication, active listening, taking the perspective of others, acceptance and accommodation of individual differences, and the evaluation of a final product developed through group effort.

APPLYING COOPERATIVE LEARNING BELIEFS AND PRINCIPLES

Knowing where to begin the process of developing cooperative learning lessons for heterogenous groups may seem daunting. There is not one "right way" to do it; one simply must jump in—with the help of some colleagues (see Villa & Thousand, chap. 6, this volume, for collaborative learning strategies for designing and implementing cooperative group lessons).

Some teachers begin by designing lessons for their whole class and then later create individualized adaptations for specific students. Others prefer to begin with one student's interests and needs and then expand the teaching concept for the whole group. Regardless of the process, the goal is to meet learning goals for individual students within a heterogeneous, cooperative learning lesson (Duncan et al, 1991).

Recently, educators attending a university course in language arts curricula development designed several cooperative learning units for their classes so that students with specific disabilities could be equal members of groups and meet their IEP goals. To guide their planning, the teachers reflected on the five elements of cooperative learning by Johnson, Johnson, Holubec, and Roy (1984): 1) face-to-face interactions, 2) positive interdependence, 3) individual accountability, 4) interpersonal and small-group skills, and 5) group processing. These elements formed the cornerstones of the lessons.

The first step teachers took was to select a grade level and a topic of interest. Working in small groups of three and four, the teachers generated ideas for the topic that could be developed into a unit of study. The five most frequently named concepts were chosen as the focal point for the unit. Once the basic lessons were sketched out, attention was turned to making adaptations for students with disabilities. Each student was described in terms of his or her learning style, interests, talents, and areas in need of support. Teaching strategies for the student were written in terms that teachers found useful; JEP goals were articulated in familiar, everyday phrases. The teachers then answered the following questions: What would be the best student composition of the groups? How would the student be best supported in a group? How would the student offer his or her talents to the group? Finally, effective evaluation strategies for the class were determined. (See Udvari-Solner, chap. 5, this volume, for specific strategies for adapting curriculum in the context of cooperative groups to accommodate students with educational and other challenges.)

One lesson developed for second grade students focuses on "dinosaurs." All aspects of the curriculum (i.e., mathematics, reading, science, social studies) are included in the unit. Students brainstorm research questions about different dinosaurs and transfer their information to a poster with illustrations. For a student with difficulty printing and recording information, coloring the illustrations with jumbo crayons is an appropriate adaptation.

Another lesson concerns "aspects of flight and flying things" for fifth grade students. Propulsion is the topic to be explored, with balloons as the primary too] in the experiment. A series of instructions are given and a lab report is the final product. For a student with difficulty reading and staying on task, instructions are provided to his or her group in a pictorial format accompanied by words. To record the results of the experiment, the student dictates his or her responses to a partner.

These two examples, as well as those detailed in the Creative Cooperative Group Lesson Plans following Section 1, this volume, illustrate how students with disabilities may be meaningfully and effectively included in cooperative learning lessons. Through the consideration of the beliefs and principles articulated in this chapter, teachers can structure cooperative learning lessons that ensure active participation in learning for all students.

CONCLUSION

In this chapter, we suggest that cooperative learning is good for all students and that it is part of comprehensive school reform efforts. To achieve this reform, teachers must work together to build networks within their school community. Teachers must also establish a cooperative classroom ethic that emphasizes overall community building, open communication about differences and classroom practices, and reciprocal helping relationships. Meaningful content in cooperative lessons is critical for the success of all students. For students to succeed within their groups, careful consideration regarding group heterogeneity must be given in conjunction with roles that ensure active, equal participation by all students. Creative assessment practices must be developed to document achievement of meaningful outcomes for students. All of these considerations require planning and structure in order for the teaching to be successful.

Some of the early literature on mainstreaming assumed that children with special education needs could be considered eligible for participation in the general education classroom when they were able to *compete* successfully with other children. This orientation implies that the burden of change is on the child and that the general education classroom is a fixed, immutable environment in which some practices, such as competition, are unamenable to change or modification. A more exciting and far-reaching way of thinking about inclusion and cooperation is based on the belief that all children belong in the general education classroom. By creating a community that is cooperative and inclusive, children's acceptance and success in the general education environment will be greatly enhanced. All students and all teachers have much to gain by structuring the classroom and school environment so that it provides generous support for learning, connecting, and caring.

REFERENCES

Ares, B., & Carnicelli, MR. (in preparation). *Third grade students' perspecttves on cooperative learning.*

Ares, B., O'Brien, L., & Rogers. T. (1992). *Working together, sharing, and helping each other: Cooperative learning inc first grade classroom that in-chides students with disabilities.* Syracuse, NY: Inclusive Education Project, Syracuse University.

Cullen, B., & Pratt, T. (1992). Measuring and reporting student progress. In S. Stainback & W. Stainback (Eds.), *Curriculum considerations In inclusive classrooms: Facilitating learning for all students* (pp. 175—196). Baltimore: Paul H. Brookes Publishing Co.

Dippong, J. (1992). Two large questions in assessing and evaluating CL: Thacher challenges and appropriate student tasks. *Cooperative Learn-trig, 13(1),* 6-8.

Duncan, J., Hedeen, D., Henneberry, MB., Kraus, J., Weber, C., Jackson, L., Trubisky, M., & Seymour, A. (1991). *Cooperative learning lessons which promote full inclusion of students with disabilities.* Syracuse, NY: Teacher Leadership In-service Project, Syracuse University.

Hibbard, KM. (1992). Bringing authentic performance assessment to life with cooperative learning. *Cooperative Learning,* 13(1), 30-32.

Johnson, D.W., Johnson, R.T., Holubec, Ed., & Roy, P. (1984). *Circles of learning.* Alexandria, VA: Association for Supervision and Curriculum Development.

Matthews, M. (1992). Gifted students talk about cooperative learning. *Educational Leadership,50(2),* 48-50.

Salisbury, C., Palombaro, MM., & Hollowood, TM. (1993). On the nature and change of an inclusive elementary school. *Journal of The Association* for *Persons with Severe Handicaps, 18(2),* 75-84.

Sapon-Shevin, M. (1990). Student support through cooperative learning. In W. Stainback & S. Stain-back (Eds.), *Support networks for inclusive schooling: Interdependent integrated education* (pp. 65-79). Baltimore: Paul H. Brookes Publishing Co.

Sapon-Shevin, M. (1991). Cooperative learning in inclusive classrooms: Learning to become a community. *Cooperative Learning, 12(1),* 8-11.

Sapon-Shevin, M., & Schniedewind, N. (198911990). Selling cooperative learning without selling it short. *Educational Leadership, 47(4),* 63-65.