# CHAPTER II: THEORETICAL BACK DROP

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2.1 INTRODUCTION

This chapter deals with meaning of Small groups learning or Cooperative learning and Characteristics of cooperative learning groups, Positive interdependence, Individual accountability/Personal Responsibility, Face-to-face promotive Interaction, Group Processing, Group Heterogeneity, Types of Cooperative learning, Bases of cooperative learning and conclusion.

2.2 BACK DROP

We are not so strong like tigers, big like elephants, protectively colored like lizards, or swift like gazelles. We are intelligent, but an intelligent human alone in the forest would not survive for long time. What has really made us such successful animals is our ability to apply our intelligence in cooperating with others to accomplish group goals. From the primitive hunting group to the cooperative boardroom, it is those of us who can solve problems while working with others. In modern society, cooperating in face-to-face groups is increasingly important. It is difficult to think of very many adult activities in which the ability to cooperate with others is important. Human society is composed of overlapping cooperative groups – families, neighborhood, work groups, political parties, clubs, teams.

Schools socialize children to assume adult roles and cooperation is a part of adult life. So it is necessary that cooperative activity would be emphasized in the schools but these activities occupy a small portion of a student’s schooling. Most of the time, students work independently, and they are continually in competition with one another for grades, praise and recognition which is against the spirit of creativity also because it favours convergent thinking in place of giving children a chance to develop divergent ideas.
Myths like “it’s a survival of the fittest society” have grown and have been nourished by those who ignore the many cooperative aspects of their lives while concentrating on those aspects that are perceived as competitive. In our society (and school) we shared common language, we drive on the appropriate side of the street, we take, turns going out doors, we raise families. This is not to say that the skills of competition and individualization are unimportant. They are important, but only within the larger context of cooperation with others, and a person needs to know when to compete or work individualistically and when to cooperate.

Cooperation is a life skill; nearly every job or social relationship involves cooperating with another individual to accomplish a shared goal. In cooperative learning, students are organized into groups. Each group is given a goal and achievement of that goal often requires group members to support each other. Cooperative learning tends to be student (group) centered, whereas individual and competitive learning tend to be teacher-centered. In a cooperative learning environment, students help each other learn the subject matter, but they also learn how to be a contributing member to a group situation.

To encourage a positive and effective learning environment to promote the achievement and socialization outcomes to schools, we must realize that cooperation is the forest; competition and individualization are but trees.

There are no skills more important to a human being than the skills of cooperative interaction. Most human interaction is cooperative interaction. Cooperation is the most important and basic form of human interaction and the skills of cooperating successfully are the most important skills anyone needs to master. Competitive and individualistic behaviour cannot take place unless there exists a broad cooperative framework.
Since almost all human behavior is cooperative, all interpersonal group, and organizational skills can be identified as cooperative skills. The skills especially important for cooperation are communication skills, skills in building and maintaining trust and controversy skills.

Vygotsky (1978) claimed that “Learning awakens a variety of internal development processes that are able to operate only when the child is interacting with people in his environment and in co-operation with the peers”. What a child can do today in co-operation, tomorrow he will be able to do on his own. Vygotsky presents a concept known as “the Zone of Proximal Development (ZPD), defined as the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers” (Hartman, 1997:150; Bransford, 2000:81). When students work cooperatively in groups and are assisted by their peers, they are able to work much close to their full potential than if they work independently. The ultimate goal, of course, is for the student to no longer require the assistance of his or her group members when solving a problem, but be able to solve it independently, having mastered the appropriate academic and cognitive skills.

Research and studies consistently prove that there are many benefits of using a cooperative learning approach. Davidson (1990) notes that adolescents have tremendous energy, and yet are traditionally asked to remain seated and remain quiet through a lesson. Additionally, adolescents have a strong need for interpersonal relationships and peer communication, and yet during class they are expected to work independently. The cooperative learning method takes advantage of both aspects of adolescent behavior, and uses those traits in a positive and productive manner.

Dees (1983) reported many positive results from her personal experience using cooperative learning. Dees noted that when learning something new, students must progress
through four types of learning in this order: facts, skills, concepts and applications. She states that applications, or problem-solving, is the highest level of cognitive process and is therefore the ultimate goal for any student. From her experience, student’s best accomplish this when working in a group where they can discuss problems amongst themselves.

Between 1988 and 2000, Johnson and Johnson (2000) conducted seventeen studies on the effectiveness of conflict resolution training in eight different schools in two different countries. Students involved were from kindergarten through ninth grades. Two approaches to peer mediation were studied--total student body and school cadre. The studies were conducted in rural, suburban, and urban settings. The training programmes lasted from 9 to 15 hours in length. Eleven of the studies involved control groups. In seven of the studies, classrooms and/or controls were selected randomly from the school; in four studies students were assigned randomly to conditions. In nine of the studies teachers were rotated across conditions. The findings indicated that students learn the conflict resolution procedures taught, retain their knowledge throughout the school year, apply the conflict resolution procedures to actual conflicts, transfer the procedures to nonclassroom and nonschool settings, use the procedures similarly in family and school settings, and, when given the option, engage in problem-solving rather than win-lose negotiations. The results further demonstrated that conflict resolution procedures can be taught in a way that increases academic achievement and that the adults in the school perceive the conflict resolution program to be constructive and helpful.

Tripathy (2004) advocated that when the cooperative group situation is used, it could create a non-threatening environment in which students can more readily take academic risks. They find it much less threatening to make a mistake in front of their group members. The verbalization and feedback from peers help to reinforce all those skills that the teacher has taught. Students who are working in groups are more likely to stay on task and remain
motivated because of peer support and encouragement. Working together, provided that the students have a clear view of the task at hand and with potential strategies can bridge the gap between computational skills and problem solving. Another big gain is the idea that working together is good. It does a lot to increase self-esteem and reduce normal peer's rejection, which is so important for our students. Cooperative group learning induces cooperative attitude in the learners, which in long run, has the potential of carry over into other areas of our competitive world.

Cooperative learning not only fulfills the criteria of cooperation rather than competition but also shapes lifeless facts into feelings and then to attitudes and values that guide our behaviour. The characteristics of cooperative learning include equal participation, participation of all group members and individual accountability (Kagan, 1990). The cooperative learning is supposed to develop positive interdependence and social skills in all the members of small group.

Cooperating learning methods are creating a classroom revolution. No longer is a quiet class thought to be a learning class; we know that learning is often best achieved in conversation among students. Teachers all over the world are breaking up the doors in which students have sat for so long, and are creating classroom environment in which students routinely help each other master academic material.

Cooperative learning is changing the essence of learning form “I” classrooms to “we” classrooms. Cooperative learning encourages students to work together cooperatively to reach a common goal. In their efforts to construct knowledge, student must work together in an interdependent team, encompassing the Credo “all for one and one for all”.

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2.3 COOPERATIVE LEARNING

Cooperation is working together to accomplish shared goals. Within cooperative activities, individuals seek outcomes that are beneficial to themselves and beneficial to all other group members. Cooperative learning is the instructional use of small groups so that students work together to maximize their own and each other’s learning. The idea is simple. Class members are organized into small groups after receiving instruction from the teacher. They then work through the assignment until all group members successfully understand and complete it. Cooperative efforts result in participants striving for mutual benefit so that all group members gain from each other’s efforts (your success benefits me and my success benefits you), recognizing that all group members share a common fate (we all sink or swim together here), knowing that one’s performance is mutually caused by oneself and one’s colleagues (we can not do it without you), and feeling proud and jointly celebrating when a group member is recognized for achievement (we all congratulate you on your accomplishment!). In cooperative learning situations, there is a positive interdependence among students’ goal attainments; students perceive that they can reach their goals (Deutsch, 1962; Johnson & Johnson, 1989). A team member’s success in creating a multi-media presentation on saving the environment, for example, depends on both individual effort and the efforts of other group members who contribute needed knowledge, skills and resources. No one group member will possess all of the information, skills, or resources necessary for the highest possible quality presentation.

According to Johnson et al. (1991), cooperative learning is an educational tool in which small groups of students work together to increase individual, as well as, group member learning. Cooperative learning exists when students work together to achieve joint learning goals (Johnson et al., 1992, 1993). Any assignment in any curriculum for any age student can be done cooperatively. There are three ways that cooperative learning may be
used. Formal cooperative learning groups may last for one class period to several weeks to complete any course requirement (such as solving problems, reading complex text material, writing an essay or report, conducting a survey or experiment, learning vocabulary, or answering questions at the end of a chapter). The teacher introduces the lesson, assigns students to groups (two to five members), gives students the materials they need to complete the assignment, and assigns students roles. The teacher explains the task, teaches any concepts or procedures the students need in order to complete the assignment, and structures the cooperation among students. Students work on the assignment until all group members have successfully understood and completed it. While the students work together the teacher moves from group to group systematically monitoring their interaction. The teacher intervenes when students do not understand the academic task or when there are problems in working together. After the assignment is completed the teacher evaluates the academic success of each student and the group process to know how well they functioned as a team. In working cooperatively, students realize they (a) are mutually responsible for each other's learning and (b) have a stake in each other's success.

Informal cooperative learning groups are temporary, ad-hoc groups that last from a few minutes to one class period that are used during a lecture, demonstration, or film to focus student attention on the material to be learned, set a mood conducive to learning, help set expectations as to what will be covered in a class session, ensure that students cognitively process the material being taught, and provide closure to an instructional session. Cooperative base groups are long-term cooperative learning groups (lasting for one semester or year) with stable membership that give each member the support, help, encouragement, and assistance he or she needs to make academic progress (attend class, complete all assignments, learn) and develop cognitively and socially in healthy ways.
It is important to highlight the distinctions between cooperative learning, individualistic learning, and competitive learning. In individualistic learning, students learn independently, without working in conjunction with their classmates. In competitive learning, students also learn independently, but are especially concerned about outperforming their classmates. In cooperative learning, students work with one another in small groups, in a non-competitive fashion to accomplish a goal. Examples of goals may include learning a concept in science, practicing the application of a formula or procedure, or solving a complicated science problem over the course of several days. It is also important to distinguish cooperative learning from simple group work. It is a common misconception that the two are the same, or similar. In simple group work, it is possible, and perhaps very likely, for students to continue working individually or competitively, despite the fact that they are physically clustered together. In cooperative learning, students work together non-competitively to accomplish a shared goal.

Researchers agree that for cooperative learning to be successful, students should be divided up into small, face-to-face groups, but there are differences of opinion as to be the best size for a group. The suggested sizes proposed by researchers range from two (i.e., pairs) to six. Group size may vary depending upon the particular activity being worked on, or the academic or social ability of the class. Some researchers feel that it is acceptable at times to randomly assign students to groups, or, to allow students to pick their own groups, but most believe it is best if the teacher creates groups that are academically heterogeneous. Most researchers also suggest that in addition to creating heterogeneous groups based on academic ability, groups should also be created such that there is diversification of gender, race, or ethnicity. For cooperative learning to be successful, students should be assigned specific roles within their group. Different researchers suggest different roles, but all of the roles fall into three main categories: academic, social, and group processing. Examples of
academic roles include researcher, problem-restate, and checker. Social roles include encourager, motivator, and praiser. Group processing roles include facilitator, observer and direction-giver. The primary reason for assigning roles is to ensure that no group member dominates the group, or contributes nothing. Assigning roles also serves to create interdependence among group members. Johnson and Johnson (1994) recommend that within a group, the assigned roles should be complementary and interconnected.

Slavin (1996) defines cooperative learning as "instructional programs in which students work in small groups to help one another master academic content...." He adds that most methods of cooperative learning involve students working in groups in which they are responsible not only for their own learning, but that of their fellow group members. Slavin (1990) believes the goal of cooperative learning is to encourage students to assist one another to maximize learning. To accomplish this, students must work together to complete a project or master material as a group. Therefore, cooperative learning fosters a collaborative atmosphere as opposed to a competitive environment. Slavin (1983) explains the two most important aspects of cooperative learning that increase student achievement are group rewards and individual accountability. Slavin (1996) cites Johnson and Johnson, in which they stated that individual mastery of material is one of the goals of cooperative learning. According to literature research conducted by McManus and Gettinger (1996), additional goals of cooperative learning include assuming leadership responsibilities, equal and active participation in the group process, positive interaction, increased learning and improved self-esteem.

What makes cooperative learning different from most instructional methods is that it is based on social interdependence theory and the related research. Social interdependence theory provides educators with a conceptual framework for understanding how cooperative learning may be (a) most fruitfully structured, (b) adapted to a wide variety of instructional
situations, and (c) applied to a wide range of issues (such as achievement, ethnic integration, and prevention of drug abuse etc.).

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.

2.4 CHARACTERISTICS OF COOPERATIVE LEARNING GROUPS

Johnson et al. (1991) have presented following six characteristics of cooperative learning groups-

1. Positive Interdependence: Team members are obliged to rely on one another to achieve their goal.
2. Individual Accountability: All students in a group are held accountable for doing their share of the work.
3. Face-to-Face Promotive Interaction: Group assignments should be constructed so that the work cannot be simply parcelled out and done individually. Assignments must include work that has to be done interactively.
4. Appropriate Collaborative Skills: Students are encouraged and helped to develop and practice trust building, leadership, decision-making, communication and conflict management.

5. Group Processing: Team members set up group goals, periodically assess whether they are doing well as a team, and identify changes they will make to function more effectively in the future.

6. Heterogeneous Groups: Individuals benefit the most from working with people different from themselves.

**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. Here 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:**

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 behaviour 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 labour is created so that the actions of one group member have to be completed if the next ember 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.

A series of studies have been conducted investigating the nature of positive interdependence and the relative power of the different types of positive interdependence
The 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.

**Individual Accountability/Personal Responsibility**

What children can do together today, they can do alone tomorrow. (Lev 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 his or her fair share of the work. The second 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 and Petty, 1982; Ingham et al., 1974; Kerr and Bruun, 1981; Latane et al., 1979; Moede, 1927; Petty et al., 1977; Williams, 1981; Williams et al., 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.
Face-to-Face Promotive Interaction

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.

Interpersonal and Small-Group Skills

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 and 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 and 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**

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 and 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 how 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 behaviours 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 meta-cognitive as well as the cognitive level, and 5) provides the means to celebrate the success of the group and reinforce the positive behaviours 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.

**Group Heterogeneity**

The size of cooperative-learning groups is relatively small and as heterogeneous as circumstances allow. The recommended size is usually four to five students. At the very least, groups should contain both males and females and students of different ability levels. If possible, different ethnic backgrounds and social classes should be represented as well.

**2.5 OUTCOMES OF COOPERATION**

Cooperative learning activities instill in learners important behaviours that prepare them to reason and perform in an adult world. A few of them have been discussed here.

**Attitudes and Values**

Adult learners form their attitudes and values from social interaction. Although we learn much about the world from books, magazines, newspapers, and audiovisual media, most of our attitudes and values are formed by discussing what we know or think with others. In this manner we exchange our information and knowledge with that of others who have acquired their knowledge in different ways. This exchange shapes our views and
perspectives. It turns cold, lifeless facts into feelings, and then to attitudes and values that guide our behaviour over longer periods of time.

These attitudes and values very often are left untaught in our schools. Many classrooms rely solely on formally acquired knowledge, with learners competing for grades and reinforcement. Yet, it is our attitudes and values that are one of the most important outcomes of schooling, because they alone provide the framework for guiding our actions outside the classroom, where there may be no formal sources of knowledge to fall back on. Cooperative learning is important in helping learners acquire from the curriculum the basic attitudes and values they need to think independently inside and outside of your classroom.

**Pro-social Behaviour**

Models of acceptable behaviour that contribute to the common good of family, friends, and community may not always be available in the home today. It is during close and meaningful encounters among family members that models of "pro-social" behaviour are communicated. Children learn right from wrong implicitly through their actions and the actions of others that come to the attention of adult family members. These adults are quick to point out the effects of these actions on family, friends, and the community.

With the decreasing presence of adults in the homes of many school-age learners, the classroom becomes an important vehicle for bolstering home and community values, or providing a substitute for them when none exist. Cooperative learning brings learners together in adult-like settings which, when carefully planned and executed, can provide appropriate models of social behavior.
2.6 TYPES OF COOPERATIVE LEARNING

According to Kagan (1992), there are over fifty forms of cooperative learning. Each has its appropriate application depending on the nature of the student population and the type of educational outcome to be fostered. Ultimately, each teacher must decide which of the cooperative-learning techniques to use and the relative amount of total in-class and out-of-class time devoted to cooperative learning. Listed here is a sampling of the forms of cooperative learning that have received the most empirical attention.

2.6.1 STUDENT TEAMS-ACHIEVEMENT DIVISION (STAD)

In STAD (Slavin, 1978), students are assigned to four-or-five-member learning teams. Each team is made as heterogeneous as possible to represent the composition of the entire class (boys/girls, less-able/more-able, etc.). In this cooperative-learning technique, students receive information via lectures, films, readings, and so on, and then receive a worksheet to complete in teams. The teams, formed by the teacher are typically heterogeneous, based on prior achievement, race, sex, language background, and other factors determined by instructor. The worksheets may contain case studies, problems to solve, or other tasks. At least one team member is given the answers to all questions or problems on the worksheet and this member is assigned the task of checking the written or oral responses of others.

Once all members have agreed that they have completed the task and mastered the skills assessed by worksheet, the instructor is called over. In addition to verbally quizzing individual team members on how the worksheet problems were solved, the instructor may give one or all members of the team a quiz that must be completed individually by team members (individual accountability). The quizzes are scored immediately and individual scores are formed into team scores (for example, by averaging all, top half, or bottom half). The contribution of individual students is determined by how much each student's quiz score
exceeds his or her past quiz average—or a preset score based on each student's learning history. This way, while the entire group receives a score based on each individual member's performance, individual learners also receive an improvement score based on the extent to which their individual score exceeds past performance or a pre-established standard that recognizes their learning history. The team is excused if individual mastery of the content is assured. This is one of the most teacher-centered of the cooperative-learning techniques as the instructor often determines the members of individual teams and their roles within the teams, the nature of the learning materials, and most other elements of the instructional sequence.

Research shows that, during Student Teams-Achievement Divisions, learners gain a sense of camaraderie and helpfulness toward fellow team members pursue self-directed learning and rehearsal strategies modeled by the teacher, and become self-motivated through having some control over their own learning.

2.6.2 TEAMS-GAMES-TOURNAMENTS (TGT)

A cooperative learning activity closely related to STAD is the use of Teams-Games-Tournaments (DeVries and Edwards, 1974). TGT uses the same general format as STAD (four-to-five-member groups studying worksheets). However, instead of individually administered quizzes at the end of a study period, students play academic games to show their mastery of the topic studied.

Students play games (e.g., 20 Questions) as weekly tournaments in which teams that are matched by ability based on previous performance compete against one another until one emerges the winner. The teams are made as heterogeneous and as evenly matched as possible so that none has a preponderance of high or low achievers. This assures that the learners always see the competition as fair and that all learners have an opportunity to contribute to a winning team. Because games and tournaments naturally interest class members, the teams
take on competitive names, such as The Warriors against The Miracle Workers, The Scholars against The Pragmatists, and so on, to enhance the excitement. Teams are often changed (monthly) to create different heterogeneous groupings from which new cooperative relationships can emerge.

As in STAD, the teacher can assign team points based on the number of questions answered correctly, and accumulated over a period of about four tournaments (weeks). Then, before exchanging team members, the winner is announced for that month, along with the number of points accumulated by each member of the winning team (for example, number of total questions answered correctly in the past four tournaments). Both team and individual member statistics are kept to see if a team and individual members can exceed the scores accumulated during any preceding month. An official scorekeeper keeps a history of team and individual scores and records them on a handout or wall chart. Thus, TGT uses much the same format as STAD, except that academic games are substituted for individually administered quizzes, adding more intensity and competition to increase interest, participation, and excitement.

2.6.3 JIGSAW

With this technique (Aronson, 1978), the teacher assigns a different mini topic to each member of a team. The students research their assigned mini topics, then meet in expert groups with members of other teams assigned the same mini topic to discuss and refine their understanding of the subject. Team members then return to their original groups to teach the mini topics to the entire team.

2.6.4 JIGSAW II

In the cooperative learning activity called Jigsaw II (Slavin, 1986), students are assigned to four-to-six-member teams to work on an academic task that is broken into several
subtasks, depending on the number of groups. Students are assigned to five-member teams and then a unique responsibility is assigned to each team member. Each student within each team is assigned a section of the text to read. Then, each team member is given a special task with which to approach the reading.

When all team members have their specific assignments, all team members having the same assignment "break out" from their original group (e.g., finding and defining new vocabulary words) to meet as “expert groups” to discuss their assignment and to share their conclusions and results. Once in an “expert group,” members may assist each other by comparing notes (e.g., definitions) and identifying points overlooked by other group members. When all the expert groups have had the opportunity to share, discuss, and modify their conclusions, they return to their respective "home groups". Each member then takes turns teaching their teammates about their respective responsibility.

Jigsaw II heightens interest among group members because the only way other team members can learn about the topics to which they were not assigned is to listen to the teammate who received that assignment. After each "expert" makes his or her presentation to the team, attempting to teach the group what they learned from their expert group, individual quizzes are given to assess how much they have learned. As in STAD, teacher can assign both an overall group score as well as individual improvement score based on past performance. These scores become the basis for team and individual rewards for the highest scorers.

2.6.5. TEAM-ASSISTED INDIVIDUALIZATION (TAI)

One of the newest cooperative learning activities is Team-Assisted Individualization (Slavin, Leavey, and Madden, 1982), which combines some of the characteristics of individualized and cooperative learning. Although originally designed for elementary and middle school mathematics classes, TAI can be used with any subject matter and grade level
for which some individualized learning materials are available (for example, programmed or self-paced texts). In TAI, teacher starts with each student working through the individualized materials at a point designated by a placement test or previous learning history. Thus, students may work at different levels depending on the heterogeneity of abilities in the classroom.

Each student is given a specified amount of content to work through (e.g., pages, problem sets, questions and answers) at his or her own pace. Also, each learner is assigned to a team selected to represent all ability levels and, therefore, individuals enter the individualized materials at different levels of complexity. Heterogeneity within the teams is important, because teacher then asks each team member to have his or her work checked by another teammate. "Checkers" are expected to have completed portions of the materials that are more advanced than others. As many group members as possible assume the role of checker. When necessary, the checkers are given answer sheets.

Student monitors give quizzes over each unit and score and record the results on a master scorecard. Team scores are based on the average number of units completed each week by team members and their scores on the unit quizzes. Those teams are rewarded that complete a preset number of units with a minimum average quiz score (e.g., with certificates, time outs, learning center privileges). One student monitor—who is rotated frequently—is assigned to each team to manage the routine checking, distribution of the individualized materials, and administering and recording the quizzes.

Because TAI uses individualized materials, it is especially useful for teaching heterogeneous classes that afford few opportunities for whole-class instruction and little time to instruct numerous small groups who may have diverse learning needs.
2.6.6 CONSTRUCTIVE CONTROVERSY (STRUCTURED CONTROVERSY)

In this method (Johnson and Johnson, 1979), pairs within a four-person team are assigned different sides of an issue. Each pair researches one side of the topic (or a summary is provided by the teacher). The two pairs discuss the topic, not to win a debate but to adduce as much information on the topic as possible. Pairs then switch sides and develop arguments for the opposite side of the same issue.

2.6.7 GROUP INVESTIGATION

In this method (Sharan and Sharan, 1976), students are given great freedom in determining how to organize their teams, conduct the research, and present their ideas to the total class. Often the class presentation is a brief play, a video or slide show, a demonstration, or some other type of performance. Even with this student-centered form of cooperative learning, however, the instructor grades the individual’s contribution to the team project to prevent the dominator/freeloader phenomenon.

2.6.8 LEARNING TOGETHER (LT)

Learning Together (Johnson and Johnson, 1975) methods were developed around the idea of having teams of four to five students turn in one assignment as a group project. The group then receives the praise and/or reward. Johnson and Johnson’s method advocates a team-building approach and provides time for lots of discussion and reflection on how team members are interacting and functioning as a group.

2.6.9 COOPERATIVE STRUCTURES (CS)

Spencer Kagan’s (Kagan, 1985) methods for cooperative learning share many commonalties with Slavin’s and Johnson and Johnson’s. However, he stated that in 1985 he moved from seeing a cooperative learning lesson as one that implemented a structure to see
the lesson as composed of structures. Thus, the cooperative learning structures became the building blocks of a lesson. He describes his cooperative learning structures as a content-free way of providing learning activities for students. Kagan states, “We place content into a structure to create a learning activity.” In this way, a teacher may change the content and have a completely different learning activity, or he/she might simply change the structure and also have a completely different learning activity. Kagan’s content-free approach has provided a very user-friendly way for teachers to implement the tenets of cooperative learning. For example, in order for students to learn their spelling words for the week, a teacher might use the structure Numbered Heads Together (students number off, teacher asks question, students put their heads together, and teacher calls a number), or she might use the structure or a simple Oral Response (all students say a response aloud after a cue from the teacher). Structures are included for content tasks that promote: Teambuilding, Class building, Mastery, Thinking Skills, Information Sharing, and Communication Skills.

Instructors may mix and match these and the several dozen other types of cooperative learning methods (Kagan, 1992; Johnson et al., 1991). It is possible to modify the techniques for different student populations and academic disciplines. However, all cooperative-learning techniques must have the following features for most effective implementation: (1) a clear specification of the instructional goal or objective, (2) group work designed to promote some attitude, to teach something, or to give practice in performing a task, and (3) some form of individual student assessment to determine goal attainment.

There are a number of "researcher-developers" who have developed cooperative learning procedures, conducted programmes of research and evaluation of their method, and then involved themselves in teacher-training programs that are commonly credited as the creators of modern-day cooperative learning. The following ten have received the most attention (Table 1.1): Complex Instruction (CI) (Cohen, 1994b), Constructive Controversy

**Table 2.1: Modern Methods of Cooperative Learning**

<table>
<thead>
<tr>
<th>Researcher Developer</th>
<th>Date</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johnson &amp; Johnson</td>
<td>Mid 1960s</td>
<td>Learning Together</td>
</tr>
<tr>
<td>DeVries &amp; Edwards</td>
<td>Early 1970s</td>
<td>Teams-Games-Tournaments (TGT)</td>
</tr>
<tr>
<td>Sharan &amp; Sharan</td>
<td>Mid 1970s</td>
<td>Group Investigation</td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
<td>Mid 1970s</td>
<td>Constructive Controversy</td>
</tr>
<tr>
<td>Aronson &amp; Associates</td>
<td>Late 1970s</td>
<td>Jigsaw Procedure</td>
</tr>
<tr>
<td>Slavin &amp; Associates</td>
<td>Late 1970s</td>
<td>Student Teams Achievement Divisions (STAD)</td>
</tr>
<tr>
<td>Cohen</td>
<td>Early 1980s</td>
<td>Complex Instruction</td>
</tr>
<tr>
<td>Slavin &amp; Associates</td>
<td>Early 1980s</td>
<td>Team Assisted Instruction (TAI)</td>
</tr>
<tr>
<td>Kagan</td>
<td>Mid 1980s</td>
<td>Cooperative Learning Structures</td>
</tr>
<tr>
<td>Stevens, Slavin &amp; Associates</td>
<td>Late 1980s</td>
<td>Cooperative Integrated Reading &amp; Composition (CIRC)</td>
</tr>
</tbody>
</table>

The combination of theory, research, and practice makes cooperative learning a powerful learning procedure. Knowing that cooperative learning can have powerful effects
when properly implemented does not mean, however, that all operationalizations of cooperative learning will be effective or equally effective in maximizing achievement. While many different cooperative learning methods are being advocated and used, educators have to decide as to which specific cooperative learning methods will be most effective in their situation.

2.7 BASES OF COOPERATIVE LEARNING

The widespread use of cooperative learning in many countries, particularly in United States of America, is due to multiple factors. Three of the most important are that cooperative learning is clearly based on theory, validated by research, and operationalized into clear procedures educators can use. First, cooperative learning is based solidly on a variety of theories in anthropology (Mead, 1936), sociology (Coleman, 1961), economics (Von Mises, 1949), political science (Smith, 1759), psychology, and other social sciences. In psychology, where cooperation has received the most intense study, cooperative learning has its roots in social interdependence (Deutsch, 1949, 1962; Johnson and Johnson, 1989), cognitive-developmental (Johnson and Johnson, 1979; Piaget, 1950; Vygotsky, 1978), and behavioural learning theories (Bandura, 1977; Skinner, 1968). It is rare that an instructional procedure is central to such a wide range of social science theories. There are several theoretical positions regarding why small-group instruction has the impact that it appears to have. From the cognitive perspective, small-group instruction allows students to cognitively rehearse and relate course material into existing schema or conceptual frameworks, thus producing a deeper, contextualized level of understanding of content (Kurfiss, 1988). When peers work together there is a great deal of modeling, cognitive disequilibrium, feedback and perspective taking that emerge as students explain and receive explanations from their colleagues.

Second, the amount, generalizability, breath, and applicability of the research on cooperative, competitive, and individualistic efforts provides considerable validation of the
use of cooperative learning, perhaps more than most other instructional methods (Cohen, 1994a; Johnson, 1970; Johnson and Johnson, 1974, 1978, 1989, 1999a; Kohn, 1992; Sharan, 1980; Slavin, 1977, 1991). There are over 900 research studies validating the effectiveness of cooperative over competitive and individualistic efforts. This body of research has considerable generalizability since the research has been conducted by many different researchers with markedly different orientations working in different settings and countries and different decades, since research participants have varied widely as to cultural background, economic class, age, and gender, and since a wide variety of research tasks and measures of the dependent variables have been used.

The third factor contributing to the widespread use of cooperative learning is the variety of cooperative learning methods available for teacher use, ranging from very concrete and prescribed to very conceptual and flexible. Cooperative learning is actually a generic term that refers to numerous methods for organizing and conducting classroom instruction. Almost any teacher can find a way to use cooperative learning that is congruent with his or her philosophies and practices. So many teachers use cooperative learning in so many different ways that all the operationalizations cannot be listed here.

Slavin (1997) has presented four major theoretical perspectives aimed at explaining the achievement effects of cooperative learning: motivational, social cohesion, developmental and cognitive elaboration perspectives.

2.7.1 MOTIVATIONAL PERSPECTIVE

Motivational perspective focus primarily on the reward or goal structures under which students operate. From a motivation list perspective, cooperative incentive structures create a situation in which the only way group members can attain their own personal goals is if all the members of the group are successful. In these conditions, group members must both help their
group mates to do whatever helps the group to succeed, and to encourage their group mates to exert maximum efforts. Evidence from practical applications of cooperative learning in elementary and secondary schools supports the motivation list position that group rewards are essential for the effectiveness of cooperative learning. Out of sixty-four studies on cooperative learning methods that provided group rewards based on the sum of group members' individual learning, fifty (78%) found significantly positive effects on achievement, and none found negative effects (Slavin, 1995).

2.7.2 SOCIAL COHESION PERSPECTIVE

This theoretical perspective is related to the motivational viewpoint. According to this approach, effects of cooperative learning on achievement are mediated by the cohesiveness of the group. Also this perspective emphasizes primarily motivational rather than cognitive explanations for the instructional effectiveness of cooperative learning. There is, however, an important difference. Motivational theory stresses extrinsic rewards: students help their group mates learn because it is in their own interests to do so. Social cohesion theorists, in contrast, emphasize the idea that students help their group mates learn because they care about the group. The social cohesion perspective emphasizes teambuilding activities in preparation for cooperative learning, as well as group self-evaluation, instead of external incentives and individual accountability. A well-known application of this theory is Aronson’s (Aronson et al., 1978) Jigsaw method, where students concentrate on different topics in "expert groups" and subsequently share their expertise in groups where students from all expert groups come together. The theoretical idea in the Jigsaw method is to create interdependence between the group members in a way that would increase social cohesion.

Johnson and Johnson (1992) have also developed a similar method and the ideas have been applied in the instructional programme called Fostering Community of Learners (FCL), developed by Brown and Cambione (1994; 1996). The method of Brown and Cambione,
which besides Jigsaw includes also many other innovative learning environment features, has proved to be effective particularly in improving higher order learning in students. This has, however, not been the case in all experiments based on the Social Cohesion theory. According to Slavin’s (1995) review, research on pedagogical applications of the Jigsaw has not generally found positive effects on student achievement. A typical problem with this method is that students do not necessarily get acquainted with material other than that which they have studied themselves. Some of the very well implemented applications of the Jigsaw method, however, indicate that it is possible to avoid this problem (Sharan and Shachar, 1988; Sharan and Sharan, 1992; Johnson and Johnson, 1994).

2.7.3 DEVELOPMENTAL PERSPECTIVE

The third perspective for explaining the mechanisms of cooperative learning proposed by Slavin (1997) was developmental theory. The fundamental assumption of the developmental perspective on cooperative learning is that interaction among children around appropriate tasks increases their mastery of critical concepts (Damon, 1984). Both major traditions of developmental psychology, the Vygotskian and the Piagetian, have substantially contributed to the theory of collaborative learning. Although Vygotsky (e.g. 1934/1994; 1935/1994) in general did not believe in the usefulness of spontaneous cooperation among children of the same age, his theoretical ideas have been widely used in later theories of cooperative learning. Particularly Vygotsky’s (1978) idea of the zone of proximal development has been useful for understanding mechanisms in collaborative learning. According to this view, collaborative activity among children promotes growth if children of similar ages have developmental differences. More advanced peers are likely to be operating within one another’s proximal zones of development, modeling in the collaborative group behaviours more advanced than those they could perform as individuals.
Piaget (1926) held that social-arbitrary knowledge -- language, values, rules, morality, and symbol systems -- could only be learned in interactions with others. Peer interaction is also important in logical-mathematical thought in disequilibrating the child's egocentric conceptualizations and in the provision of feedback to the child about the validity of logical constructions. On the basis of Piaget's theory a group of psychologists undertook a systematic empirical investigation of how social interaction affects individual cognitive development (Doise and Mugny, 1984). These researchers borrowed from the Piagetian perspective its structural framework and the major concepts that were used to account for development: conflict and the coordination of points of view (cent rations) (Dillenbourg et al., 1996).

2.7.4 COGNITIVE ELABORATION PERSPECTIVE

Cognitive Elaboration means a theoretical perspective in which cooperative learning is assumed to be effective because it requires participants to elaborate their cognitive structures in a social context. One of the most effective means of elaboration is explaining the material to someone else. Several studies on peer tutoring have found achievement benefits for the tutor as well as the tutee (Devin-Sheehan et al., 1976). Webb (1989, 1992) found that the students who gained the most from cooperative activities were those who provided elaborated explanations to others.

The cognitive elaboration idea of cooperative learning has been successfully applied in writing process models (Graves, 1983), in which students work in peer response groups or form partnerships to help one another draft, revise, and edit compositions. The well-known Reciprocal Teaching model developed by Palincsar and Brown (1984) can also be considered as an example of the cognitive elaboration perspective. In Reciprocal Teaching, cooperative learning is a method for teaching reading comprehension skills. In this technique, students are taught to formulate questions for one another about a text. Students have to process the material themselves and learn how to focus on the essential elements of the
reading passages before they are able to do comprehension modeling. Studies of Reciprocal Teaching have supported its effects on student achievement (Jarvela, 1996).

2.7.5 RECONCILING THE FOUR PERSPECTIVES

The four theoretical perspectives discussed above all have well-established rationales, and most have supporting evidence. All apply in some circumstances, but none are probably both necessary and sufficient in all circumstances. Research in each tradition tends to establish setting conditions favorable to that perspective. For example, most research on cooperative learning models from the motivational and social cohesiveness perspectives takes place in real classrooms over extended periods, as both extrinsic motivation and social cohesion may be assumed to take time to show their effects. In contrast, studies undertaken from the developmental and cognitive elaboration perspectives tend to be very short, making issues of motivation moot. These latter paradigms also tend to use pairs, rather than groups of four; pairs involve a much simpler social process than groups of four, which may need time to develop ways of working well together. Developmental research almost exclusively uses young children trying to master conservation tasks, which bear little resemblance to the "social-arbitrary” learning that characterizes most school subjects; cognitive elaboration research mostly involves college students.

However, the alternative perspectives on cooperative learning may be seen as complementary, not contradictory. For example, motivational theorists would not argue that the cognitive theories are unnecessary. Instead, they would argue that motivation drives cognitive process, which in turn produces learning. For example, it is unlikely that over the long haul students would engage in the kind of elaborated explanations found by Webb (1989) to be essential to profiting from cooperative activity. Similarly, motivational theorists would hold that an intermediate effect of extrinsic incentives must be to build cohesiveness, caring, and pro-social norms among group members, which could in turn affect cognitive processes.
One model of the relationship among the four alternative perspectives is diagrammed below (Slavin, 1995).

Figure 2.1: Perspective Relationship Model

The process depicted in the diagram shows how group goals might operate to enhance the learning outcomes of cooperative learning. Provision of group goals based on the individual learning of all group members might affect cognitive processes directly, by motivating students to engage in peer modeling, cognitive elaboration, and/or practice with one another. Group goals may also lead to group cohesiveness, increasing caring and concern among group members, making them feel responsible for one another's achievement, thereby motivating students to engage in cognitive processes which enhance learning. Finally, group goals may motivate students to take responsibility for one another independently of the teacher, thereby solving important classroom organization problems.
Assessment and Correction Enhanced Learning and providing increased opportunities for cognitively appropriate learning activities.

From the perspective of the model diagrammed in Figure 2.1, researchers from outside of the motivational perspective are attempting to short-circuit the process to intervene directly on mechanisms identified as mediating variables in the full model. For example, social cohesion theorists intervene directly on group cohesiveness by engaging in elaborate teambuilding and group processing training. The Sharan and Shachar (1988) Group Investigation study suggests that this can be successfully done, but it takes a great deal of time and effort. In this study, teachers were trained over the course of a full year, and then teachers and students used cooperative learning for three months before the study began. Earlier research on Group Investigation failed to provide a comparable level of preparation of teachers and students, and the achievement results of these studies were less consistently positive (Sharan et al., 1984).

Cognitive theorists would hold that the cognitive processes that are essential to any theory relating cooperative learning to achievement could be created directly, without the motivational or affective changes discussed by the motivation list and social cohesion theorists. This may turn out to be accurate, but at present demonstrations of learning effects from direct manipulation of peer cognitive interactions have mostly been limited to very brief durations and to tasks that lend themselves directly to the cognitive processes involved. For example, the Piagetian conservation tasks studied by developmentalists have few practical analogs in the school curriculum. However, the research on Reciprocal Teaching in reading comprehension (Palincsar and Brown, 1984) shows promise as a means of intervening directly in peer cognitive processes. Long-term applications of Dansereau’s (1988) cooperative scripts for comprehension of technical material and procedural instructions also seem likely to be successful.
2.8 CONCLUSION

The present study is related to small groups learning strategy based teaching of science to 8th standard students. The study requires a good theoretical background of the chosen variables and is attempted in this chapter.