CHAPTER – I

INTRODUCTION

1.1 CONCEPT OF COOPERATIVE LEARNING

*Ua dullah maa al-jamaa (God's hand is with the group).*

Arabic saying

The human-species seems to have a cooperation imperative: We desire and seek out opportunities to operate jointly with others to achieve mutual goals. Cooperation is an inescapable fact of life. From cradle to grave we cooperate with others in family, work, leisure, and community by working jointly to achieve mutual goals. Throughout history, people have come together to (a) accomplish feats that any one of them could not achieve alone and (b) share their joys and sorrows. From conceiving a child to sending a rocket to the moon, our successes require cooperation among individuals.

Cooperation is working together to accomplish shared goals. Within cooperative situations, 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. Students perceive that they can reach their learning goals if and only if the other students in the learning group also reach their goals. Not all grouping, however, is cooperative. A number of basic elements must be implemented if grouping is to be truly cooperative.

Cooperative efforts result in participants recognizing that all group members share a common fate (*We all sink or swim together*), strive for mutual benefit so that all group members gain from each other's efforts (*Your efforts benefit me and my efforts benefit you*), recognize that one's performance is mutually caused by oneself and one's colleagues (*United we stand, divided we all*), empower each other (*Together we can achieve anything*), and feel proud and celebrate jointly when a group member is recognized for achievement (*You got an A! That is terrific!*).
1.2 WHAT IS COOPERATIVE LEARNING?

To understand the nature of cooperative learning, it is necessary to place it within the broader context of social interdependence. Social interdependence is defined as each individual's outcomes being affected by the actions of others. Interdependence among individuals' goals may be positive (e.g., cooperation) or negative (e.g., competition). Social independence, on the other hand, is characterized by individualistic action where the outcomes of each person are unaffected by others' actions.

Cooperation is working together to accomplish shared goals. Cooperative learning is the instructional use of small groups so that students work together to maximize everyone's learning. Within cooperative learning groups, students discuss the material to be learned with one another, help one another to understand it, and encourage one another to work hard. Competitive learning is students working to achieve a goal, such as a grade of A, that only one or a few students can attain. Striving to achieve higher than other students involves obstructing each other's attempts to achieve. Individualistic learning is students working by themselves to accomplish learning goals unrelated to those of the other students.

Cooperative learning is an arrangement in which students work in mixed ability groups and are rewarded on the basis of the success of the group (Woolfolk 2001).

In cooperative learning, teams. Each with students of different levels of ability, use a variety of learning activities to improve their understanding of a subject. Each member of a team is responsible not only for learning what is taught but also for helping team mates learn, thus, creating an atmosphere of achievement. Cooperative effort results in participants striving for mutual benefits so that all group members:

- gain from each other’s efforts.
- recognize that all group members share a common fate.
• Know that one’s performance is mutually caused by oneself and one’s team members.

• Feel proud and jointly celebrate when a group member is recognized for achievement (Johnson and Johnson, 2011).

As the stream of time takes us inexorably into 21st century, many people are beginning to question the direction the stream is taking us. Voices, both inside education and outside it, are heard demanding more efficient "teacher production." There is great emphasis nowadays on interactive, cooperative and collaborative learning in which we emphasize each person's voice, create an atmosphere of democracy where all opinions are heard, all perspectives are valued, and finally where we build an atmosphere of community, a classroom community.

Parents as well as teachers would like to see collaboration as the core of the curriculum. The value of cooperative learning has been recognized throughout human history. Organizing individuals to work in support of one another and putting the interests of the group ahead of one's own are abilities that have characterized some of the most successful people of our time. Group learning, with its roots in ancient tribal customs, has traditionally been a part of educational practice. Its effectiveness has been documented through hundreds of research studies (Johnson & Johnson, 1986; Kagan, 1986; Slavin, 1988).

Cooperative learning is now widely recognized as one of the most remarkable and fertile areas of theory, research, and practice in education. Finally we can say that cooperation, collaboration, consideration, creativity, responsibility, participation all these things seem to become involved in the 21st century, as does the suggestion of stretching the student's experience beyond individual knowing to a kind of collaborative wisdom.

Cooperative learning exists when students work together to accomplish shared learning goals (Johnson & Johnson, 1999). Each student can then achieve his or her learning goal if and only if the other group members achieve theirs (Deutsch, 1962). In the past three decades, modern cooperative learning has become a widely used
Cooperative learning is an instructional strategy that simultaneously addresses academic and social skill learning by students. It is a well-researched instructional strategy and has been reported to be highly successful in the classroom. Cooperative learning is one of the best researched of all teaching methods. The results show that students who have opportunities to work collaboratively learn faster and more efficiently, have greater retention, and feel more positive about the learning experience. Needless to say, this is not to say that students can just be put into a group and assigned a project to complete. There are very specific methods to assure the success of group work, and it is essential that both teachers and students are aware of them. Recently there has been criticism of this process largely as a result of its misuse.

There is an every increasing need for interdependence in all levels of our society. Providing students with the tools to effectively work in a collaborative environment should be a priority. Cooperative Learning is one way of providing students with a well defined framework from which to learn from each other. Students work towards fulfilling academic and social skill goals that are clearly stated. It is a team approach where the success of the group depends upon everyone pulling his or her weight.
### TABLE 1.1 Aspects of Cooperation

<table>
<thead>
<tr>
<th>Goal</th>
<th>Class members are assigned to small groups (often heterogeneous) and instructed to (a) learn the assigned material and (b) ensure all other group members do likewise.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Levels of Cooperation</td>
<td>Cooperation may be extended to the class (by ensuring that everyone in the class has learned the assigned material) and the school (by ensuring that all students in the school are progressing academically) levels.</td>
</tr>
<tr>
<td>Interaction Pattern</td>
<td>Students promote each other’s success. Students discuss material with each other, explain how to complete the assignment, listen to each other’s explanations, encourage each other to work hard, and provide academic help and assistance. This interaction pattern exists between as well as within groups.</td>
</tr>
<tr>
<td>Evaluation of Outcomes</td>
<td>A criteria-referenced assessment and evaluation system is used. The focus is usually on the learning and academic progress of the individual student but may also include the group as a whole, the class, and the school.</td>
</tr>
</tbody>
</table>

Griswold and Rogers (1995) defined cooperative learning as “the instructional use of small groups, so that students work together to maximize their own and each other’s learning; a method of instruction by which students work together in small groups to reach a common goal; and an activity that facilitates collaborative efforts among students.”

Foyle and Lyman (1998) defined cooperative learning as a teaching strategy involving children’s participation in small group learning activities that promote positive interaction.

Cooperative learning is a process by which students work together in groups “to master material initially presented by the teacher” (Slavin 1990). To be successful, all members in a group must achieve mastery of the material or contribute to the
completion of a group assignment. Cooperative-learning promoted academic achievement is relatively easy to implement and is not expensive. Children’s improved behaviour and attendance and increased liking of school are some of the benefits of cooperative learning (Slavin 1987). Although much of the research on cooperative learning has been done with older students, cooperative learning methods are effective with younger children in pre-school centres and primary classrooms. In addition to the positive outcomes just noted, cooperative learning promotes students’ motivation, encourages group processes, fosters social and academic interaction among students and rewards successful group participation in the learning of school subjects.

Johnson, Johnson and Smith (1991) referred to cooperative learning as the instructional use of small groups so that students work together to maximize their own and each other’s learning. Cooperative learning produces higher achievement, more positive relationships among students and healthier psychological adjustment than do competitive or individualistic experience.

Flowers and Ritz (1994) viewed cooperative learning as a teaching strategy where teams of two or more work together on learning tasks. Each member of the team brings special talents to the group, i.e., concrete or analytical abilities or others. Also other team members cooperate on the achievement of the tasks and learn from each other. It also means taking the talents of individuals and pooling these together to get the job done. As a result, students learn both academic and social skills from a cooperative learning environment.

**Definitions:**

“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*

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

*Let Vygotsky*
“Cooperative learning is a successful teaching strategy in which small teams, each with students of different levels of ability, use a variety of learning activities to improve their understanding of a subject. Each member of a team is responsible not only for learning what is taught but also for helping teammates learn, thus creating an atmosphere of achievement”.

Mayer

“Cooperative Learning is "working together to accomplish shared goals".

Johnson & Johnson

Cooperative learning is a set of instructional methods "which employs small teams of pupils to promote peer interaction and cooperation for studying academic subjects"

Sharan

1.3 ELEMENTS OF COOPERATIVE LEARNING

The essential components of cooperation are positive interdependence, face-to-face promotive interaction, individual and group accountability, interpersonal and small group skills, and group processing (Johnson, Johnson, & Holubec, 1993). Systematically structuring those basic elements into group learning situations helps ensure cooperative efforts and enables the disciplined implementation of cooperative learning for long-term success.

1. Positive Interdependence (sink or swim together).

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. The first and most important element in structuring cooperative learning is positive interdependence. Positive interdependence is successfully structured when group members perceive that they are linked with each other in a way that one cannot succeed unless everyone succeeds. Group goals and tasks, therefore, must be designed and communicated to students in ways that make them believe they sink or swim together. When positive interdependence is solidly structured, it highlights that (a) each group member's efforts are required and indispensable for group success and (b) 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. Doing so creates a
commitment to the success of group members as well as one's own and is the heart of cooperative learning. If there is no positive interdependence, there is no cooperation.

2. **Face-To-Face Interaction (promote each others success).**

   The second basic element of cooperative learning is promotive interaction, preferably face-to-face. Students need to do real work together in which they promote each other's success by sharing resources and helping, supporting, encouraging, and applauding each other's efforts to achieve. There are important cognitive activities and interpersonal dynamics that can only occur when students promote each other's learning. This includes:-

   (a) Orally explaining how to solve problems.
   (b) Teaching one's knowledge to other.
   (c) Discussing concepts being learned.
   (d) Connecting present with past learning.

   Each of those activities can be structured into group task directions and procedures. Doing so helps ensure that cooperative learning groups are both an academic support system (every student has someone who is committed to helping him or her learn) and a personal support system (every student has someone who is committed to him or her as a person). It is through promoting each other's learning face-to-face that members become personally committed to each other as well as to their mutual goals.

3. **Individual Accountability (no hitchhiking, no social loafing).**

   Two levels of accountability must be structured into cooperative lessons. The group must be accountable for achieving its goals and each member must be accountable for contributing his or her share of the work. Individual accountability exists when the performance of each individual is assessed and the results are given back to the group and the individual in order to ascertain who needs more assistance, support, and encouragement in learning. The purpose of cooperative learning groups is to make each member a stronger individual in his or her right. Students learn together so that they subsequently can gain greater individual competency. It will happen in following manner:-
(a) Keeping the size of the group small. The smaller the size of the group, the greater the accountability may be
(b) Giving an individual test to each student.
(c) 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.
(d) Observing the each group and recording the frequency with which each member contributes to the group’s work.
(e) Assigning one student in each the role of checker. The checker asks other group members to explain the reasoning and rationale underlying the group answers.
(f) Having students teach what they learned to someone else.

4. Social Skills.

Social skills must be taught. The fourth basic element of cooperative learning is teaching students the required interpersonal and small group skills. Cooperative learning is inherently more complex than competitive or individualistic learning because students have to engage simultaneously in taskwork (learning academic subject matter) and teamwork (functioning effectively as a group). Social skills for effective cooperative work do not magically appear when cooperative lessons are employed. Instead, social skills must be taught to students just as purposefully and precisely as academic skills. Leadership, decision-making, trust-building, communication, and conflict-management skills empower students to manage both teamwork and task work successfully. Since cooperation and conflict are inherently related (see Johnson & Johnson, 1995), the procedures and skills for managing conflicts constructively are especially important for the long-term success of learning groups. Procedures and methods for teaching students social skills may be found in Johnson (1991, 1993) and Johnson and F. Johnson (1994).

5. Group Processing.

The fifth basic element of cooperative learning is group processing. Group processing exists when group members discuss how well they are achieving their goals and maintaining effective working relationships. Groups need to describe what member actions are helpful and unhelpful and make decisions about what behaviors to
continue or change. Continuous improvement of the processes of learning results from the careful analysis of how members are working together and determining how group effectiveness can be enhanced.

The basic elements of cooperative learning can be considered essential to all interactive methods. Student groups are small, usually consisting of two to six members. Grouping is heterogeneous with respect to student characteristics. Group members share the various roles and are interdependent in achieving the group learning goal. While the academic task is of primary importance, students also learn the importance of maintaining group health and harmony, and respecting individual views.

1.4 BENEFITS OF COOPERATIVE LEARNING

When used, research has shown that it helps to improve academic achievement, behavior, attendance, self-confidence, and motivation. It will also help with: the developing and using of critical thinking skills and teamwork; the promoting of positive relations among different ethnic groups; the implementing of peer coaching; and the establishing of environments where academic accomplishments are valued. Cooperative Learning has several benefits for the students involved on several different levels.

(a) Global benefits
   (i) higher achievement.
   (ii) committed relationships
   (iii) greater self-esteem for the students involved.

(b) Academic benefits.
   (i) Involves students actively in the learning process
   (ii) promotes critical thinking skills
   (iii) models appropriate problem solving techniques
   (iv) motivates students in specific curriculums
   (v) improves classroom achievement.
(c) Social benefits

(i) Develops a social support system for students
(ii) builds diversity understanding among all
(iii) establishes a positive atmosphere for cooperation
(iv) develops learning communities.

(d) Psychological benefits

(i) Increases student's self-esteem
(ii) reduces student anxiety
(iii) develops positive attitudes towards curriculum and teacher.

(e) Assessment benefits:

(i) Utilizes a variety of assessment techniques and procedures
(ii) provides a basis for alternative forms
(iii) provides instantaneous feedback for students and teachers.

Research has shown that cooperative learning techniques promote student learning and academic achievement increase student retention enhance student satisfaction with their learning experience help students develop skills in oral communication develop students' social skills promote student self-esteem help to promote positive race relations.

1.5 COOPERATIVE LEARNING IN THE CLASSROOM

Although there are limitations on when and where competitive and individualistic learning may be used appropriately, any learning task in any subject area with any curriculum may be structured cooperatively.

There are three types of cooperative learning. Cooperative learning groups may be used to teach specific content (formal cooperative learning groups), to ensure active cognitive processing of information during a lecture or demonstration (informal cooperative learning groups), and to provide long-term support and assistance for academic progress (cooperative base groups) (Johnson, Johnson, & Holubec, 2002; John-son, Johnson, & Smith, 2006).
1.6 CLASS ROOM ACTIVITIES THAT USE COOPERATIVE LEARNING

Cooperative learning can take place in a variety of circumstances. For example, brainstorming and tutorial groups, when employed as instructional methods, provide opportunities to develop cooperative learning skills and attitudes. Various methods exist for cooperative learning and can be used at whenever the instructor deems it fit to use them. Most of these structures are developed by Dr. Spencer Kagan. Certain activities that use cooperative learning are given in succeeding paragraphs.

**Jigsaw.** Groups with five students are set up. Each group member is assigned some unique material to learn and then to teach to his group members. To help in the learning, students across the class working on the same sub-section get together to decide what is important and how to teach it. After practice in these "expert" groups the original groups reform and students teach each other. (Wood, p. 17) Tests or assessment follows.

**Think-Pair-Share.** It involves a three step cooperative structure. During the first step individuals think silently about a question posed by the instructor. Individuals pair up during the second step and exchange thoughts. In the third step, the pairs share their responses with other pairs, other teams, or the entire group.

**Three-Step Interview (Kagan).** Each member of a team chooses another member to be a partner. During the first step individuals interview their partners by asking clarifying questions. During the second step partners reverse the roles. For the final step, members share their partner's response with the team.

**RoundRobin Brainstorming (Kagan).** Class is divided into small groups (4 to 6) with one person appointed as the recorder. A question is posed with many answers and students are given time to think about answers. After the "think time," members of the team share responses with one another round robin style. The recorder writes down the answers of the group members. The person next to the recorder starts and each person in the group in order gives an answer until time is called.

**Three-minute review.** Teachers stop any time during a lecture or discussion and give teams three minutes to review what has been said, ask clarifying questions or answer questions.
**Numbered Heads Together (Kagan).** A team of four is established. Each member is given numbers of 1, 2, 3, 4. Questions are asked of the group. Groups work together to answer the question so that all can verbally answer the question. Teacher calls out a number (two) and each two is asked to give the answer.

**Team Pair Solo (Kagan).** Students do problems first as a team, then with a partner, and finally on their own. It is designed to motivate students to tackle and succeed at problems which initially are beyond their ability. It is based on a simple notion of mediated learning. Students can do more things with help (mediation) than they can do alone. By allowing them to work on problems they could not do alone, first as a team and then with a partner, they progress to a point they can do alone that which at first they could do only with help.

**Circle the Sage (Kagan).** First the teacher polls the class to see which students have a special knowledge to share. For example the teacher may ask who in the class was able to solve a difficult math homework question, who had visited Mexico, who knows the chemical reactions involved in how salting the streets help dissipate snow. Those students (the sages) stand and spread out in the room. The teacher then has the rest of the classmates each surround a sage, with no two members of the same team going to the same sage. The sage explains what they know while the classmates listen, ask questions, and take notes. All students then return to their teams. Each in turn, explains what they learned. Because each one has gone to a different sage, they compare notes. If there is disagreement, they stand up as a team. Finally, the disagreements are aired and resolved.

**Partners (Kagan).** The class is divided into teams of four. Partners move to one side of the room. Half of each team is given an assignment to master to be able to teach the other half. Partners work to learn and can consult with other partners working on the same material. Teams go back together with each set of partners teaching the other set. Partners quiz and tutor teammates. Team reviews how well they learned and taught and how they might improve the process.

**Dyadic Learning.** Students work in dyads (pairs) to read and study their content area material. They begin by reading one or two pages of the text. One partner is designated as the "recaller" responsible for orally summarizing from memory what has been read. The other partner, as "listener/facilitator," follows in the book and
corrects errors, clarifies concepts, and elaborates on the material. They may use drawings or diagrams to facilitate understanding and retention of the information. Then they read another section of text and switch roles.

**Team word webbing.** Students work in groups; write on chart paper or newsprint, drawing main concepts, supporting elements, and bridges representing the relations of ideas among the concepts (concept map). Concept development, higher levels of thinking

**Cybernetic Sessions.** The teacher uses questions to guide students through an active process of analysis and synthesis. The teacher writes specific thought provoking questions about what has been studied, one each, on poster sized sheets of paper which are placed in different parts of the room. The class is divided into groups of 5 students, and each group is assigned a poster. The students record their answers to the question on the poster. Then the groups move to the next poster clockwise from them and add to the answers they find there. The groups proceed in turn to add to the answers on all of the questions. Their time with each question is limited to 3-5 minutes

### 1.7 TEACHER’S ROLE IN COOPERATIVE LEARNING

For a cooperative lesson the teacher, make a number of preinstructional decisions, explain to students the instructional task and the cooperative nature of the lesson, conduct the lesson, and evaluate and process the results. More specifically, one can follow these steps:

1. **Make preinstructional decisions.** In every lesson you (a) formulate objectives, (b) decide on the size of groups, (c) choose a method for assigning students to groups, (d) decide which-roles to assign group members, (e) arrange the room, and (f) arrange the materials students need to complete the assignment

2. **Explain the task arid cooperative structure.** In every lesson you (a) explain the academic assignment to students, (b) explain the criteria for success, (c) structure positive interdependence, (d) explain the individual accountability, and (e) explain the behaviors you expect to see during the lesson,
3. **Monitor and intervene.** While you (a) conduct the lesson, you (b) monitor each learning group and (c) intervene when needed to improve task work and teamwork, and (d) bring closure to the lesson.

4. **Evaluate and process.** You (a) assess and evaluate the quality and quantity of student achievement, (b) ensure students carefully process the effectiveness of their learning groups, (c) have students make a plan for improvement, and (d) have students celebrate the hard work of group members.

In each class session teachers must make the choice of being "a sage on the stage" or "a guide on the side." In doing so they might remember that *the challenge in teaching is not covering the material or the students, it's uncovering the material with the students.*

### 1.8 GROUPING AND WORKING TOGETHER

Organizing students to work together in small groups is an ancient practice in education throughout the world (Slavin 1995). Today, it is one of the most researched instructional methods in education. Working in cooperative groups, students learn valuable social skills, use higher-order thinking and rehearse and practice new concepts, processes and information. Cooperative group learning does not happen successfully unless it is well orchestrated and certain considerations prevail. These considerations increase the chances that the groups will work well together and achieve targeted standards (Gregory and Chapman 2002).

Over the last two decades, cooperative learning has achieved broad-based support from researchers and classroom teachers (Slavin 1999). Accordingly “the frequency indicates that this approach to instruction is well suited in the educational mainstream.” (Antil, Jenkins, Wayne and Vadasy 1998).

The acronym TASK (Robbins, Gregory and Herndon 2000) can be used to remember the aspects of cooperative learning.

- **T** Thinking is built into the process.
- **A** Accountability is essential. Goal achievement: both individual and group
- **S** Social skills for team success.
- **K** Keeping everyone on TASK: Roles, tasks, resources, novelty. Simulations and clear expectations.
Similarly, the acronym GROUPS conveys as follows when we work in Groups (Johnson and Johnson, 1996), as:

- **G**: Give Encouragement
- **R**: Respect others
- **O**: Stay on task
- **U**: Use quiet voices
- **P**: Participate actively
- **S**: Stay in our GROUP

Without the cooperation of its members, society cannot survive. The society of the human beings 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 (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., text co books curriculum, programmes) and some time is spent on how teachers should interact with students, but how students should interact with one another is relatively ignored. How teachers structure student-student interaction patterns has a lot to say about 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 towards 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. A vast majority of students in the country 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 & Johnson 1991). Cooperation among students, who celebrate each other’s successes, encourages 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.
1.9 HOW TO CREATE AN EFFECTIVE GROUP?

To be effective a group must do three things: achieve its goals; maintain good working relationships among members; and adapt to changing conditions in the surrounding organization, society, and world. To create such a group we should use the following set of guidelines. These guidelines provide direction for building an effective group, a framework for diagnosing how well a group is functioning, and a means for motivating group members to improve.

GUIDELINES FOR CREATING EFFECTIVE GROUPS

*Guideline 1*: Establish clear, operational, and relevant group goals that create positive interdependence and evoke a high level of commitment from every member. Groups exist for a reason: People want to achieve goals they are unable to achieve by themselves. In effective groups, goals must be stated clearly so that all members understand the nature of the goals. Additionally, goals must be operational so that members understand how to achieve them. Goals also must be relevant to members' needs so that they commit themselves to achieving the goals. Finally, the group's goals must create positive interdependence among members.

*Guideline 2*: Establish effective two-way communication by which group members communicate their ideas and feelings accurately and clearly. Communication is the basis for all human interaction and group functioning, and it is especially important when groups of people are working toward a common goal. Group members must send and receive messages effectively "in order to exchange information and transmit meaning. Effective communication also can decrease misunderstandings and discord among group members. Effective communication depends on minimizing competition among members and establishing two-way communication.

*Guideline 3*: Ensure that leadership and participation are distributed among all group members. All members of a group are responsible for providing leadership. Equal participation and leadership ensures that all members are invested in the group's work committed to implementing the group's decisions, and satisfied with their membership. Shared leadership and participation also enables the group as a whole to
use the resources of every individual, thereby increasing the cohesiveness of the group.

**Guideline 4: Ensure that power is 'distributed among group members and that patterns of influence vary according to the needs of the group.** In effective groups, members' power is based on expertise, ability, and access to information, not on authority or personality characteristics. Power struggles among group members can distract the group from its purpose and goals, ultimately making the group useless. To prevent power struggles, every member of the group must have some power of influence in some part of group work. As a group evolves and new goals are set, the distribution of power also needs to evolve. To this end, group members should form coalitions that help fulfill personal goals on the basis of mutual influence and interdependence. **Guideline 5: Match decision-making procedures with the needs of the situation.** Groups can make decisions in a variety of ways, but there must be a balance between the time and resources a group has available and the method of decision making it uses. A jury deciding a death penalty case, for example, would require a unanimous decision, whereas a church group deciding when to hold its next meeting may not. Balance also is needed among the size and seriousness of the decision, the commitment needed to put it into practice, and the method used for making the decision. The most effective way of making a decision usually is by consensus (unanimous agreement). Consensus promotes distributed participation, the equalization of power, constructive controversy, cohesion, involvement, and commitment.

**Guideline 6: Engage in constructive controversy by disagreeing and challenging one another's conclusions and reasoning, thus promoting creative decision making and problem solving.** In order to make effective decisions, members must present the best case possible for each major course of action and subject all other alternatives to critical analysis. Controversies over opposing ideas and conclusions are beneficial for groups, because they promote involvement in the group's work, quality and creativity in decision making, and commitment to implementing the group's decisions. Controversies also help ensure that minority and dissenting opinions receive serious discussion and consideration.
Guideline 7: Face your conflicts and resolve them in constructive ways. Conflicts of interest may result from incompatible needs or goals/scarc resources, and competitiveness. Five basic methods can be used to manage conflicts of interest: withdrawal, forcing (win-lose negotiations), smoothing, compromise, and problem-solving (win-win negotiations). Members of effective groups face their conflicts and engage in integrative problem-solving negotiations to resolve them. When problem-solving negotiations fail, mediation may occur. When they are resolved constructively, conflicts are an important and indispensable aspect of increasing group effectiveness.

1.10 GROUP DYNAMICS

Perfect group dynamics having small groups skills can change the study. They can make one more employable and lead to greater career success. They can improve friendships. They can lead to more caring and loving family relationships and greater competence as parents. They can promote greater psychological health and increased ability to cope with stress and adversity. When it comes to group functioning, knowledge does give power. But knowledge of group dynamics in itself is not sufficient to promote effective functioning; social skills also are required. To promote effective group functioning, one must know what an effective group is and have the necessary social skills to help create one.

As one come to know about groups—how they operate and are constructed, and why a group is effective and productive—what you are learning is the nature of groups. To that end, one should focus on the following ideas:

1. The nature of group structure
2. The relationship between group structure and group productivity
3. How the dynamics of the group determine its effectiveness
4. The ways groups develop over time.
1.11 GROUP STRUCTURE

When we are studying small groups. Although many diverse types of groups may be found, when we approach a new group we look for the basic features'-that characterize all groups. These features include a purpose that defines the territory of the group and binds the members together, a definable pattern of communication among members, different members performing different functions that fit into an overall division of labor, procedures for managing conflicts, expectations concerning acceptable and unacceptable behavior by group members, and the adaptation of the group to the organization, society, and culture within which it is based- Once the basic structure has been identified, the nature of interpersonal relations in the group can be understood as clearly.

Groups have a structure. Groups function as their members interact, and whenever two or more individuals join together to achieve a goal, a group structure develops. Observers of groups who want to know how a group truly functions look beyond the group's unique features to its basic structure, a stable pattern of interaction among members. Two aspects of group interaction are especially important to understanding how a group is structured: differentiated roles and integrating norms- Within any group, no matter which organization, society, or culture it belongs to, the group's roles and norms structure the interaction among group members- Roles differentiate the responsibilities of group members, whereas norms integrate members' efforts into a unified whole.

ROLES: DIFFERENTIATION WITHIN GROUPS

A considerable degree of differentiation usually exists within groups, meaning different members work on different tasks and are expected to accomplish different things, m other words, different group members play different roles.

Roles define the formal structure of the group and differentiate one position from another. Formally, a role may be defined as a set of expectations governing the appropriate behavior of an occupant of a position toward occupants of other related positions. Often such roles are assigned in a relatively formal manner, such as appointing a president, secretary, treasurer, and so on. At other times, individuals drift into various roles on the basis of their interests and skills. Once a role is assumed,
however, the member is expected (by other group members) to behave in certain ways- Members who conform to their role requirements are rewarded, whereas those who deviate are punished.

Roles ensure that the task behaviors of group members are interrelated appropriately so that the group's goals are achieved. The roles usually are complementary in that one cannot be performed without the other (e.g., the roles of "teacher" and "student"). The expectations that define a role include rights and obligations; the obligations of one role are the rights of other roles- One of the obligations of being a teacher, for example, includes structuring a learning situation, whereas one of the rights of being a student is to have learning situations structured by the teacher. Within a group, expectations of the obligations that accompany a particular role can conflict; this is called role conflict. What a principal expects from a teacher and what students expect from a teacher, for example, can be contradictory. Contradictory expectations, therefore, can create one type of role conflict.

A second type of role conflict occurs when the demands of one role are incompatible with the demands of another role. Every person is required to play multiple roles, and almost everyone belongs to more than one group. Sometimes such role conflict can provide great drama. Back in the Old West, for example, Sheriff Pat Garrett was called on to arrest the famous outlaw Billy the Kid. Billy the-Kid also happened to be one of Garrett's best friends, but Garrett shot him anyway. This situation, although extreme, illustrates how roles can influence our actions in ways that make us act contrary to our private feelings or vested interests.

**NORMS: INTEGRATION OF MEMBERS' ACTIONS**

Whereas roles differentiate members' rights and obligations from one another, norms integrate the actions of all group members. Norms are rules, implicit or explicit, established by groups to regulate the behavior of all members. Norms tell group members how to behave, or how not to behave, in various situations, hi. short, the norms of a group are the group's common belief regarding appropriate behavior, attitudes, and perceptions for its members. These prescribed modes of conduct and belief not only guide the behavior of group members but also help group interaction by specifying the kinds of responses that are expected and acceptable in- particular
situations. Norms thus provide a basis for predicting the behavior of other members and serve as a guide for a member's own behavior.

All groups have norms, and they may be set formally or informally. A group of students who party together, for example, often has common ideas about what is acceptable and unacceptable behavior at a party. More formally organized groups, such as classes, have norms about absence, tardiness, accomplishment of assigned work, and appropriate tunes to speak. In any group, some norms specify the behavior expected of all group members and others apply only to individuals in specific roles, in the classroom, for instance, some norms govern both the teacher's and the students' behavior, but others may apply only to the teacher or only to the students. Because norms refer to the expected behavior sanctioned by a group, they have an "ought to" or "must" quality: Group members must not disrupt the group's work, group members ought to participate in discussions, and so on.

The norms of any group vary in importance- Norms that have a low effect on the objectives and values of the group usually allow for a greater range of behavior and bring less severe pressures for members to conform than do norms more relevant to group functioning. Because most groups insist on adherence to their norms as a basic requirement for membership, individuals wishing to join or remain in specific groups generally follow these "rules of the game." If they do not, they soon may find themselves on the outside looking in.

For a group norm-to influence a person's behavior, the person must recognize that it exists, be aware that other group members accept and follow the norm, and accept and follow it himself or herself. A regulation that all members should be on time for group meetings, for example, becomes a norm only to the extent that the individual group member accepts it, sees other group members accepting it, and sees them enforcing the regulation among themselves. At first a person may conform to a group norm because the group typically rewards conforming behavior and punishes non conforming behavior. Later the person may internalize the norm and conform to it automatically, even when no other group members are present.

Norms cannot be imposed on a group, instead, they develop out of the interaction among group members. This concept of norms being social products was demonstrated ingeniously by Muzafer Sherif in 1936. When a fixed point of light is
viewed in total darkness, it appears to move spontaneously, a perceptual phenomenon known as the autokinetic effect.

1.12 TYPES OF GROUPS

Table 1.2

Types of Groups

<table>
<thead>
<tr>
<th>Type of Group</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pseudogroup</td>
<td>a. A group in which members work together to accomplish shared goals. Members perceive that they can reach their goals if and only if the other group members also reach their goals.</td>
</tr>
<tr>
<td>Traditional group</td>
<td>b. A group whose members have been assigned to work together but who have no interest in doing so: The structure promotes competition at close quarters.</td>
</tr>
<tr>
<td>Effective group</td>
<td>c. A group that meets all the criteria for being an effective group and outperforms all reasonable expectations, given its membership.</td>
</tr>
<tr>
<td>High-performance group</td>
<td>d. A group whose members agree to work together but see little benefit from doing so. The structure promotes individualistic work with talking.</td>
</tr>
</tbody>
</table>

1.13 FORCES HINDERING GROUP PERFORMANCE

Performance and small groups go hand in hand. Although cooperative groups outperform individuals working alone, there is nothing magical about groups. There are conditions under which groups function effectively and conditions under which groups function ineffectively. Potential barriers to group effectiveness are as follows (Johnson & F.Johnson, 1997);

1. **Lack of group maturity.** Group members need time and experience working together to develop into an effective group. Temporary, ad hoc groups usually do not develop enough maturity to function with full effectiveness.
2. Uncritically giving one's dominant response. A central barrier to higher-level reasoning and deeper-level understanding is the uncritical giving of members' dominant response to academic problems and assignments. Instead, members should generate a number of potential answers and choose the best one.

3. Social loafing—hiding in the crowd. When a group is working on an additive task (group product is determined by summing together individual group members' efforts), and individual members can reduce their effort without other members realizing that they are doing so, many people tend to work less hard. Such social loafing has been demonstrated on a variety of additive tasks such as rope pulling, shouting, and clapping.

4. Free riding—getting something for nothing. On disjunctive tasks (if one member does it, all members receive the benefit), there is the possibility of a free ride. When group members realize that their efforts are dispensable (group success or failure depends very little on whether or not they exert effort), and when their efforts are costly, group members are less likely to exert themselves on the group's behalf.

5. Motivation losses due So perceived inequity—not being a sucker. When other group members are free riding, there is a tendency for the members who are working to reduce their efforts to avoid being a "sucker."

6. Groupthink. Groups can be overconfident in their ability and resist any challenge or threat to their sense of invulnerability by avoiding any disagreements and seeking concurrence among members.

7. Lack of sufficient heterogeneity. The more homogeneous the group members, the less each member adds to the group's resources. Groups must develop the right mix of taskwork and teamwork skills necessary to do their work. Heterogeneity ensures a wide variety of resources are available for the group's work.

8. Lack of teamwork skills. Groups with members who lack the small group and interpersonal skills required to work effectively with others often underperform their most academically able members.

9. Inappropriate Group Size. The larger the group, the fewer members that can participate, the less essential each member views his or her personal
contribution, the more team-work skills required, and the more complex the
group structure,

Not every group is effective. Most everyone has been part of a group that
wasted time, was inefficient, and generally produced poor work. But some groups
accomplish wondrous things. Educators must be able to spot the characteristics of
ineffective groups and take action to eliminate them. The hindering factor are
eliminated by the basics of cooperation.

1.14 TYPES OF COOPERATIVE LEARNING GROUPS

These problems are endemic to all institutions of education, regardless of
level. Children sit for 12 years in classrooms where the implicit goal is to listen to the
teacher and memorize the information in order to regurgitate it on a test. Little or no
attention is paid to the learning process, even though much research exists
documenting that real understanding is a case of active restructuring on the part of the
learner. Restructuring occurs through engagement in problem posing as well as
problem solving, inference making and investigation, resolving of contradictions, and
reflecting. These processes all mandate far more active learners, as well as a different
model of education than the one subscribed to at present by most institutions. Rather
than being powerless and dependent on the institution, learners need to be empowered
to think and learn for themselves. Thus, learning needs to be conceived of as
something a learner does, not something that is done to a learner.

Catherine Fosnot (1989)

Cooperative learning groups are divided into three types. Formal cooperative
learning groups last from one class period to several weeks. You may structure any
academic assignment or course requirement for formal cooperative learning. Formal
cooperative learning groups ensure that students are actively involved in the
intellectual work of organizing material, explaining it, summarizing it, and integrating
it into existing conceptual structures. They are the heart of cooperative learning.
Informal cooperative learning groups are ad hoc groups that last from a few minutes
to one class period. You use them during direct teaching (lectures, demonstrations,
films, videos) to focus students' attention on the material they are to learn, set a mood
conducive to learning, help set expectations as to what the lesson will cover, ensure
that students cognitively process the material you are teaching, and provide closure to an instructional session. Cooperative base groups are long-term (lasting for at least a year), heterogeneous groups with stable membership whose primary purpose is for members to give each other the support, help, encouragement, and assistance each needs to progress academically. Base groups provide students with long-term, committed relationships.

In addition to the three types of cooperative learning, cooperative learning scripts are standard cooperative procedures for (a) conducting generic, repetitive lessons (such as writing reports or giving presentations) and (b) managing classroom routines (such as checking homework and reviewing a test). Once planned and conducted several times, scripted repetitive cooperative lessons and classroom routines become automatic activities in the classroom.

### 1.15 A TYPOLOGY OF COOPERATIVE LEARNING

Cooperative learning methods differ in many ways, but they can be categorized according to the following six principal characteristics.

1. **Group Goals.** Most cooperative learning methods use some form of group goals. In the Student Team Learning methods, these may be certificates or other recognition given to teams that meet a preset criterion; in the Johnsons' methods, group grades are often given.

2. **Individual Accountability.** This is achieved in two ways. One is to have group scores be the sum or average of individual quiz scores or other assessments, as in the Student Team Learning models. The other is task specialization, whereby each student is given a unique responsibility for part of the group task (see below).

3. **Equal Opportunities for Success.** A characteristic unique to the Student Team Learning methods is the use of scoring methods that ensure all students an equal opportunity to contribute to their teams. These methods consist of improvement points (STAD), competition with equals (TGT), or adaptation of tasks to individual performance levels (TAI and CIRC).

4. **Team Competition.** Early studies of STAD and TGT used competition between teams as a means of motivating students to cooperate within teams.
5. **Task Specialization.** A key element of Jigsaw, Group Investigation, and other task-specialization methods is the assignment of a unique subtask to each group member.

6. **Adaptation to Individual Needs.** Most cooperative learning methods use group-paced instruction, but two TAI and CIRC Instruction are found to be adapted to students' individual needs. On the basis of description above the most widely known models of cooperative learning were developed by three groups of advocates:

   (a) Slavin and associates

   (b) The Johnsons

   (c) The Sharans and S. Kagan. Sharan and Sharan and Kagan do not collaborate directly, but both have developed group investigation types of cooperative learning models. Differences among these models include their relative emphasis on competition among the small groups, the use of external rewards, group versus individual grading practices, and general versus specific subject matter learning.

Students must work together to accomplish a common goal or to receive a common reward. Cooperative learning models recommend heterogeneous ability or achievement grouping methods for the bulk of the instructional time. Most of the models include explicit guidelines for group composition in which a range of high, medium, and low achieving students is to be placed in each cooperative group (Johnson, Johnson, & Holubec, 1990; Slavin, 1980). Other cooperative models are less directive about the range of achievement in the groups, but do assume and encourage heterogeneity (Aronson, Blaney, Stephan, Sikes, & Snapp, 1978; Burns, 1987; Sharan & Sharan, 1976).

Finally, peer tutoring or partner teaching is often a component of cooperative learning models. Aronson's Jigsaw, Teams-Games-Tournament (TGT), Student Teams Achievement Divisions (STAD), and Cooperative Integrated Reading and Composition (CIRC) explicitly include students tutoring one another within small groups. Although peer tutoring may consist of pairs of students who tutor or teach one another different materials, cooperative learning most often implies that students
collaborate in groups larger than two and that they learn the same materials (Slavin, Leavey, & Madden, 1984, p. 410).

**Teams-Games-Tournament (TGT).** TGT, originally developed by Edwards and De Vries (1972), is a generic strategy used in any subject matter area. Students are placed in four members heterogeneous teams. They receive a teacher directed lesson, help one another master the material, and compete in weekly tournaments with others of similar achievement (Slavin, 1986). Despite the temporary grouping of students by achievement level for tournaments in TGT, the lessons presented to the students, the materials completed by them, and the pace of instruction are the same for all students in the class. Worksheets are the primary instructional materials used in TGT. Slavin (1991) noted that TGT is best suited to basic skill instruction.

**Student Teams Achievement Divisions (STAD).** STAD is a generic method used in any subject matter area. According to Slavin (1986), STAD works best with material that has single, correct answers and is most likely to be used in mathematics computation, spelling, language usage, and mechanics. As in TGT, students are placed in four member heterogeneous groups for teacher directed instruction and for assisting one another in mastering the basic material. The tournaments used in TGT are replaced with individually administered quizzes in which students do not assist one another. STAD like TGT was developed to provide grade level instruction in basic skill areas at the same general pace for all students. A cooperative learning method for mixed-ability groupings involving team recognition and group responsibility for individual learning. Then the groups return to their original question, synthesize the answers, and report. In Student Teams-Achievement Divisions (STAD) (Slavin, 1994a), students are assigned to four-member learning teams that are mixed in performance level, gender, and ethnicity. The teacher presents a lesson, and then students work within their teams to make sure that all team members have mastered the lesson. Finally, all students take individual quizzes on the material, at which time they may not help one another.

Students’ quiz scores are compared to their own past averages, and points are awarded on the basis of the degree to which students meet or exceed their own earlier performance. These points are then summed to form team scores, and teams that meet certain criteria may earn certificates or other rewards. In a related method called
Teams-Games-Tournaments (TGT), students play games with members of other teams to add points to their team scores. STAD and TGT have been used in a wide variety of subjects, from mathematics to language arts to social studies, and have been used from second grade through college. The STAD method is most appropriate for teaching well-defined objectives with single right answers, such as mathematical computations and applications, language usage and mechanics, geography and map skills, and science facts and concepts. However, it can easily be adapted for use with less well-defined objectives by incorporating more open-ended assessments, such as essays or performance.

**Team Accelerated Instruction (TAI).** TAI (later renamed Team Assisted Individualization) was developed for pre algebra mathematics instruction in grades three through six (Slavin, 1986). It includes specific TAI instructional materials on basic mathematics operations and topics: addition, subtraction, multiplication, division, numeration, fractions, decimals, ratio, percent, statistics, and algebra. Students are assigned to four or five member heterogeneous teams, are pretested, and enter the curriculum at the point designated by their pretest performance. They work through curriculum units which contain guide page reviewing the concepts, skill practice pages, formative quizzes, a 15-item unit test, and answer pages so that a student monitor may score the test. All students also take mathematics facts tests twice a week. The management functions of securing materials, checking student papers, and scoring tests are the responsibility of the students. After each three-week period of individualized instruction, the teacher conducts group-paced instruction for a week.

**Cooperative Integrated Reading and Composition (CIRC).** CIRC was developed for grade level reading and writing instruction in the elementary grades. Research studies have been reported for grades 3-4 and grades 2-6 (Stevens, Madden, Slavin, & Farnish, 1987; Stevens, Slavin, & Farnish, 1991). Instruction is primarily based on basal readers and involves direct instruction in reading comprehension, integrated writing, and language arts using a writing process approach. Heterogeneous teams are composed of members of at least two different reading groups who read to one another, answer questions about the story, practice spelling and vocabulary words, and writes on a topic related to the basal story. Team members receive points based on individual performance on quizzes and composition which are "added" to produce a
team score. Achievement criteria are specified; teams that meet the criteria receive certificates. A comprehensive program for teaching reading and writing in the upper elementary grades; students work in four-member cooperative learning teams. (CIRC) (Stevens & Slavin, 1995a) is a comprehensive program for teaching reading and writing in the upper elementary grades. Students work in four-member cooperative learning teams. They engage in a series of activities with one another, including reading to one another, making predictions about how narrative stories will come out, summarizing stories to one another, writing responses to stories, and practicing spelling, decoding, and vocabulary. They also work together to master main ideas and other comprehension skills. During language arts periods, students engage in writing drafts, revising and editing one another’s work, and preparing for publication of team books. Three studies of the CIRC program have found positive effects on students’ reading skills, including improved scores on standardized reading and language tests (Stevens et al., 1987; Stevens & Slavin, 1991, 1995a).

**Circles of Learning or Learning Together.** Johnson and Johnson have emphasized group process in their generic model characterized by explicit and sustained teaching of structured social skills. Most of the research by the developers and their associates compared the cooperative goal structure (in which groups work together) with a competitive condition (in which teams or individuals compete with one another) and with an individualistic condition (in which students work alone on material). Heterogeneous groups of two to six students with maximum variation in levels of achievement are recommended. In addition, the Johnsons have suggested unmotivated students be placed in groups with on-task students. In some cases, students are permitted to work together to complete a single worksheet or product for a group grade (Johnson, Johnson, & Holubec, 1990).

**Cooperative Controversy.** Cooperative Controversy, also developed by the Johnsons, relies on the constructive use of conflict to increase learning (Johnson, Johnson, & Holubec, 1990). Heterogeneous groups of four students are given materials about a controversial topic—for example, the hunting of wolves in Northern Minnesota—and asked to debate. Two students take one side of the controversial issue; the remaining two team members argue the opposite view. Then the two pairs of students switch sides and argue the opposite points of view. Presumably, the same kinds of group
products and group grades would be possible in this form of cooperative learning as in
the original Circles of Learning or Learning Together.

**Jigsaw and Jigsaw II.** The Jigsaw models were developed for narrative materials in
the core content areas like social studies, science, literature, and other school subjects
in which the goal is to learn concepts rather than skills (Aronson et al. 1978; Slavin,
1986). Heterogeneous groups of students are given sections or chapters of material to
read and teach "their topic" or a part of the text to others in their group. As is the case
with TGT, STAD, Circles of Learning, and Cooperative Controversy, the Jigsaw
models rely primarily on grade level texts and other printed materials.

**Group Investigation.** In contrast to the cooperative learning models which are
largely structured around traditional texts and classroom materials, Group
Investigation is an interest-based study of a topic selected by the teacher (Sharan &
Sharan, 1976). Small groups of students select subtopics, develop and carry out a
learning plan, and prepare a small group presentation for the entire class. Teachers and
students evaluate group and individual contributions. Students work on group
products, give group presentations, and receive group evaluations. However,
individual achievement is assessed through examinations as well. Presumably,
students have access to any materials including reference materials relevant to their
subtopic. The most extensive research study on Group Investigation was conducted in
Israel with problems in history and geography (Sharan & Shachar, 1988). A
cooperative learning model in which students work in small groups using cooperative
inquiry, group discussion, and cooperative planning and projects, and then make
presentations to the whole class on their findings.

**Co-op Co-op and Cooperative Structures.** Like Group Investigation, Co-op Co-op
is based on heterogeneous small groups studying a subtopic as part of a whole class
investigation. Co-op Co-op encourages library research, interviewing, original data
gathering, and creative products. Students are teacher and self evaluated on team
presentations, their written products, and on their contributions to the team. Kagan
(1989/1990) has also encouraged the use of short term cooperative structures
developed by other educators as well as himself. Two examples of these structural
cooperaive methods are Think-Pair-Share and Numbered Heads Together, which are
variations of group discussion. Few published studies are available on the short term cooperative activities or on Co-op Co-op.

**Groups of Four.** Developed for elementary mathematics, Groups of Four is a collection of cooperative problem solving activities. In one study conducted by its originator, this approach resulted in improved problem-solving skills for students when compared with the traditional classroom (Burns, 1981). The author does not propose the model as a comprehensive mathematics curriculum. According to Slavin (1986), the research evidence on this application of cooperative learning has not been extensive or promising.

**Descubrimiento or Finding Out.** Descubrimiento was developed as a hands-on elementary science program for the bilingual classroom. Students work together on experiments to discover scientific concepts and principles. Materials are printed in Spanish and English (De Avila & Duncan, 1980) and an implementation manual has been developed (Navarette, Cohen, De Avila, Benton, Lotan, & Parchment, 1985). Little published research is currently available on Descubrimiento.

### 1.16 STUDENT TEAMS-ACHIEVEMENT DIVISIONS (STAD)

STAD is one of the simplest of all cooperative learning methods, and is a good model to begin with for teachers who are new to the cooperative approach.

**Overview**

STAD consists of five major components—class presentations, teams, quizzes, individual improvement scores, and team recognition.

**Class Presentations.** Material in STAD is initially introduced in a class presentation. This is most often direct instruction or a lecture-discussion conducted by the teacher, but could include audiovisual presentations. Class presentations in STAD differ from usual teaching only in that they must be dearly focused on the STAD unit. In this way, students realize they must pay careful attention during the class presentation, because doing so will help them do well on the quizzes, and their quiz scores determine their team scores.

**Teams.** Teams are composed of four or five students who represent a cross-section of the class in terms of academic performance, sex, and race or ethnicity. The major
The function of the team is to make sure that all team members are learning, and, more specifically, to prepare its members to do well on the quizzes. After the teacher presents the material, the team meets to study worksheets or other material. Most often, the study involves students discussing problems together, comparing answers, and correcting any misconceptions if teammates make mistakes.

The team is the most important feature of STAD. At every point, emphasis is placed on team members doing their best for the team, and on the team doing its best to help its members. The team provides the peer support for academic performance that is important for learning, and it provides the mutual concern and respect that are important for such outcomes as intergroup relations, self-esteem, and acceptance of mainstreamed students.

**Quizzes.** After approximately one to two periods of teacher presentation and one to two periods of team practice, the students take individual quizzes. Students are not permitted to help one another during the quizzes. Thus, every student is individually responsible for knowing the material.

**Individual Improvement Scores.** The idea behind the individual improvement scores is to give each student a performance goal that can be attained if he or she works harder and performs better than in the past. Any student can contribute maximum points to his or her team in this scoring system, but no student can do so without doing his or her best work. Each student is given a "base" score, derived from the student's average past performance on similar quizzes. Students then earn points for their teams based on the degree to which their quiz scores exceed their base scores.

**Team Recognition.** Teams may earn certificates or other rewards if their average scores exceed a certain criterion. Students' team scores may also be used to determine up to 20 percent of their grades.

**PREPARATION**

**Materials.** STAD can be-used with curriculum materials specifically designed for Student Team Learning and distributed by the Johns Hopkins Team Learning Project or it can be used with materials adapted from textbooks or other published sources or with teacher-made materials. Johns Hopkins materials are available for mathematics.
for grades two through ten, language arts for grades three through eight, junior high
school life and physical science, and other topics.

**Assigning Students to Teams.** As we have seen, STAD teams represent a cross-
section of the class. A four-person team in a class that is half male, half female, three-
quarters white, and one-quarter minority might have two boys and two girls and three
white students and one minority student. The team would also have a high performer,
a low performer, and two average performers. Of course, *high performer* is a relative
term; it means high for the class, not necessarily high compared with national norms.

We may take likes, dislikes, and "deadly combinations" of students into account in
assigning students to teams, but do not let students choose their own teams, because
they will tend to choose others like themselves. Instead follow these steps:

1. **Make copies of team summary sheets.** Make one copy of a team summary
   sheet for every four students in your class.

2. **Rank students** On a sheer of paper, rank the students in your class from high-
est to lowest in past performance. Use whatever information you have to do
   this; test scores are best, grades are good, but your own judgment is fine. It
   may be difficult to be exact in your ranking, but do the best you can.

3. **Decide on the number of teams.** Each team should have four members if pos-
sible. To decide how many teams you will have, divide the number of students
   in the class by four. If the number is divisible by four, the quotient will be the
division of four-member teams you should have. For example, if there are
thirty-two students in the class, you would form eight teams with four mem-
ers each. If the division is uneven, the remainder will be one, two, or three.
You will then have one, two, or three teams composed of five members. For
example, if there are thirty students in your class, you would have seven teams
five teams would have four members and two would have five members.

4. **Assign students to teams.** In assigning students or teams, balance the teams so
that (a) each team is composed of students whose performance levels range
from low to average to high, and (b) the average performance level of all the
teams in the class is about equal. Using your list of students ranked by perfor-
ance, assign team letters to each student. For example, in an eight-team class
you would use the letters A through H. Start at the top of your list with the let-
ter A; continue lettering toward the middle. When you get to the last team letter, continue lettering in the opposite order. For example, if you were using the letters A—H, the eighth and ninth students would be assigned to team H, the tenth to team G, the next to team F, and so on. When you get back to letter A, stop and repeat the process from the bottom up, again starting and ending with the letter A.

Note that two of the students (17 and 18) are not assigned at this point. They will be added to teams as fifth members, but first the teams should be checked for race or ethnicity and sex balance. If, for example, one-fourth of the class is black, approximately one student on each team should be black. If the teams you have made based on performance ranking are not evenly divided on both ethnicity and sex (they will hardly ever be balanced on the first try), you should change team assignments by trading students of the same approximate performance level, but of different ethnicity or sex, between teams until a balance is achieved.

5. **Fill out team summary sheets.** Fill in the names of the students on each team on your team summary sheets leaving the team-name space blank.

_Determining Initial Base Scores._ Base scores represent students' average scores on past quizzes. If you are starting STAD after you have given three or more quizzes, use students' average quiz scores as base scores. Otherwise, use students' final grades from the previous year.

_Team Building._ Before starting any cooperative learning program, it is a good idea to start off with one or more team-building exercises just to give team members a chance to do something run and to get to know one another.

**Schedule of Activities.**

STAD consists of a regular cycle of instructional activities, as follows:

_Teach._ Present the lesson

_Team study._ Students work on worksheets in their teams to master the material.

_Test._ Students take individual quizzes.
Team recognition. Team scores are computed based on team members' improvement scores, and individual certificates, a class newsletter, or a bulletin board recognize high-scoring teams.

Teach

Time: 1—2 class periods Main idea; present the lesson Materials needed; your lesson plan

Each lesson in STAD begins with a class presentation. The presentation should cover the opening, development, and guided-practice components of our total lesson; team activities and quiz cover independent practice and assessment, respectively. In our lesson, stress the following (adapted from Good, Grouws and Ebmeier, 1983).

Opening

- Tell students what they are about to learn and why it is important. Arouse student curiosity with a puzzling demonstration, real-life problem, or other means.
- You may have students work in their teams to "discover" concepts or to whet their appetites for the lesson.
- Briefly review any prerequisite skills or information.

Development

- Stick close to the objectives that you want students to learn.
- Focus on meaning, not memorization-
- Actively demonstrate concepts or skills, using visual aids, manipulatives, and many examples.
- Frequency assess student comprehension by asking many questions.
- Explain why an answer is correct or incorrect, unless this is obvious.
- Move to the next concept as soon as students have grasped the main idea.
- Maintain momentum by eliminating interruptions, asking many questions, and moving rapidly through the lesson.

Guided Practice

- Have all students work problems or examples or prepare answers to your questions.
• Call on students at random. This makes all students prepare themselves to answer.

• Do not give long class assignments at this point. Have students work one or two problems or examples or prepare one or two answers, then give them feedback.

TEAMSTUDY

Time: 1—2 class periods

Main idea: students study in their teams

Materials needed: two worksheets for every team two answer sheets for every team. During team study, team members' tasks are to master the material you presented in your lesson and to help their teammates master the material. Students have worksheets and answer sheets they can use to practice the skill being taught and to assess themselves and their teammates. Only two copies of the worksheets and answer sheets are given to each team—this forces teammates to work together—but if some students want their own copies, the teacher may make additional copies available.

On the first day of team work in STAD one should explain to students what it means to work in teams. In particular, before beginning team work discuss the following team rules (which you may list on a bulletin board or chalkboard):

1. Students have a responsibility to make sure that their teammates have learned the material.

2. No one is finished studying until all teammates have mastered the subject.

3. Ask all teammates for help before asking the teacher. ("Ask three before me,")

4. Teammates may talk to each other softly.

5. Teacher may encourage students to add additional rules if they like. Then proceed follows:

   • Have teammates move their desks together or move to team tables.
   
   • Give teams about ten minutes to choose a team name. Any teams that cannot agree on a name in that time may choose one later.
   
   • Hand out worksheets and answer sheets (two of each per team).
- Suggest that students work together in pairs or threes or work as a whole team, depending on the objectives being studied. If they are working problems (as in math), each student should work the problem individually and then check with his or her partner(s). If anyone missed a question, his or her teammates have a responsibility to explain it. If students are working on short-answer questions, they may quiz each other, with partners taking turns holding the answer sheet or attempting to answer the questions-

- Emphasize to students that they are not finished studying until they are sure their teammates will make 100 on the quiz.

- Make sure that students understand that the worksheets are for studying — not merely for filling out and handing in. Thus, it is important for students to have the answer sheets to check themselves and their teammates as they study.

- Have students explain answers to one another instead of just checking each other against the answer sheet: -

- Remind students that if they have questions, they should ask all teammates before asking you.

- While students are working in teams, circulate through the class, praising teams that are working well, sitting in with each team to hear how team members are doing, and so on.

**TEST**

Time: ½ -1 class period

Main idea: individual quiz

Material needed: one quiz per student

Distribute the quiz and give students adequate time to complete it. *Do not let students work together on the quiz;* at this point students must show what they have learned as individuals. Have students move their desks apart if this is possible.

Either allow students to exchange papers-with members of other teams, or collect the quizzes to score after class. Be sure to have the quizzes scored and team score figured in time for the next class.
TEAM RECOGNITION

Main idea: figuring individual improvement scores and team scores and awarding, certificates or other team rewards.

Figuring Individual and Team Scores

As soon as possible after each quiz, figure individual improvement scores and team scores and award certificates or other rewards to high-scoring teams. If possible, announce team scores in the first period after the quiz. This makes the connection between doing well and receiving recognition clear to students, and in turn increases their motivation to do their best.

Improvement Points. Students earn points for their teams based on the degree to which their quiz scores (percentage correct) exceed their base scores:

**Table 1.3**

**Improvement Points**

<table>
<thead>
<tr>
<th>Quiz Score</th>
<th>Improvement Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>more than 10 points below base score</td>
<td>5</td>
</tr>
<tr>
<td>10 points below to 1 point below base score</td>
<td>10</td>
</tr>
<tr>
<td>base score to 10 points above base score</td>
<td>20</td>
</tr>
<tr>
<td>more than 10 points above base score</td>
<td>30</td>
</tr>
<tr>
<td>perfect paper (regardless of base score)</td>
<td>30</td>
</tr>
</tbody>
</table>

Before one begins to figure improvement points, he will need one copy of a quiz score, sheet. Figuring improvement points is not at all difficult, and when we get used to it will take only a few minutes Depending on their ages, students themselves may do part or all of this task shows how improvement points would be computed for one set of students.

The purpose of base scores and improvement points is to make it possible for all students to bring maximum points to their teams, whatever their level of past performance. Students understand that it is fair to compare each student with his or her own level of past performance, since all students enter class with different levels of skills and experience.
**Team Scores.** To figure a team's score, record each team member's improvement points on the team summary sheet and divide team members' total improvement point by the number of team members who were present, rounding off any fractions. Note that team scores depend on improvement scores rather than on raw quiz scores.

**Recognizing Team Accomplishments**

Three levels of awards are given. These are based on average team scores, as follows:

<table>
<thead>
<tr>
<th>Criterion (Team Average)</th>
<th>Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>GOODTEAM</td>
</tr>
<tr>
<td>20</td>
<td>GREATTEAM</td>
</tr>
<tr>
<td>25</td>
<td>SUPERTEAM</td>
</tr>
</tbody>
</table>

Note that all teams can achieve the awards; teams are not competing with one another.

These criteria are set so that to be a Greatteam most team members must score above their base scores, and to be a Superteam most team members must score at least ten points above their base scores. Teacher may change these criteria if he wish.

*Teacher* should provide some sort of recognition or reward for achieving at the Great team or Superteam level. Attractive certificates to each team member may be used, a large, fancy certificate (8 1/2-by 11 inches) for Superteams and a smaller one for Great-teams. Examples of certificates appear in. Goodteams should just receive congratulations in class or, if you wish, small certificates. Many teachers make bulletin board displays listing the weeks Superteams and Greatteams, or display Polaroid pictures of the successful teams. Others prepare one-page newsletters, give students special buttons to wear, or let Superteams and Greatteams line up first for recess receive other special privileges. Use your imagination and creativity, and vary rewards from time to time; it is more important to be excited about your students' accomplishments than to give them large rewards.
Team Summary Sheet

Table 1.4

Team name fantastic four

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<tr>
<th>Team Members</th>
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<th>11</th>
<th>12</th>
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<th>14</th>
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<td>A</td>
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</tr>
</tbody>
</table>

Total Team Score 100

Team Average 25

Team Award  Super team

Team Average = Total team score ÷ Number of team members.

Returning the First Set of Quizzes

When we return the first set of quizzes (with the base scores, quiz scores, and improvement points) to the students, teacher will need to explain the improvement point system. In his explanation, he emphasize the following:

1. The main purposes of the improvement point system are to give every minimum score to try to beat and to base that minimum score on past performance so that all students will have an equal chance to be successful if they their best academically.

2. Students must realize that the scores of everyone on their team are important—that all members of the team can earn maximum improvement if they do their best.
3. The improvement point system is fair because everyone is competing only with himself or herself—trying to improve his or her own performance—regarding of what the rest of the class does.

**Recomputing Base Scores**

Every marking period (or more frequently, if you like), recomputed students' average (quiz scores on all quizzes and assign students new base scores.

**Changing Teams**

After five or six weeks of STAD or at the end of a marking period, reassign students new teams. This gives students who were on low-scoring teams a new chance, allow Students to work with other classmates, and keeps the program fresh.

**Grading**

Report card grades should be based on students' actual quiz scores, not on their improvement points or team scores. Some teachers, especially in high schools, give five bonus points (on a 100-point scale) to students on Supeneams and three points to students on Greaneams. However, students' individual report card grades should otherwise be separate from their team scores, because students and their parents will see group grades as unfair (especially if they reduce the grades of high achievers).

### 1.17 GROUP INVESTIGATION (GI)

The most extensively researched and successful of the task specialization methods is Group Investigation, a form of cooperative learning that dates back to John Dewey (1970), but has been refined and researched in more recent years by Shiomo and Yael Sharan and Rachel Hertz-Lazarowitz in Israel.

**Rationale**

Group Investigation has its origins in philosophical, ethical, and psychological writings dating to the early years of this century. First among the prominent forebears of this educational orientation is John Dewey. Dewey viewed cooperation in the classroom as a prerequisite for dealing with the complex problems of life in a democracy. The classroom is a cooperative enterprise where teacher and pupils build the learning process on mutual planning based on their respective experiences, capacities, and needs. Learners are active participants in all aspects of school life, making
decisions that determine the goals toward which they work. The group affords the social vehicle for this process. Group planning is one method for ensuring maximum pupil involvement.

A cooperative-investigation method of classroom learning derives from the premise that in both the social and intellectual domains the school learning process incorporates the values it advocates. Group Investigation cannot be implemented in an educational environment that does not support interpersonal dialogue or that disregards the affective-social dimension of classroom learning. Cooperative interaction and communication among classmates are best achieved within the small group, where exchange among peers and cooperative inquiry can be sustained. The social-affective aspect of the group, its intellectual exchange, and the meaning of the subject matter itself provide the primary sources of meaning for students' efforts to learn.

**Acquiring Group Skills.** Successful implementation of Group Investigation requires prior training in communication and social skills. This phase is often called *laying the groundwork or team building.* The teacher and students experience a variety of academic and nonacademic activities that establish norms of appropriate cooperative behavior in the classroom.

As the name implies, Group Investigation is appropriate for integrated study projects that deal with the acquisition, analysis, and synthesis of information in order to solve a multi-faceted problem. The academic task should allow for diverse contributions from group members, and not be designed simply to obtain answers to factual questions (who, what, when, and so on). For example, Group Investigation would be ideal for teaching about the history and culture of a country or about the biology of the rain forest, but would not be appropriate for teaching map skills or the periodic table of the elements. Generally, the teacher designates a broad topic, which the students then break down into subtopics. These subtopics are an outgrowth of student backgrounds and interests, as well as of the exchange of ideas among the students.

As part of the investigation the students seek information from a variety of source inside and outside the classroom. Such sources (books, institutions, people) offer range of ideas, opinions, data, solutions, or positions regarding the problem
being studied. The students then evaluate and synthesize the information contributed by each group member in order to produce a group product.

**Cooperative Planning.** Central to Group Investigation is students’ *cooperate planning* of their inquiry. Group members take part in planning the various dimension and requirements of their project. Together they determine what they want to invest gate in order to "solve" their problem; which resources they require; who will do what and how they will present their completed project to the class. Usually there is division of labor in the group that enhances positive interdependence among members.

Cooperative planning skills should be introduced gradually into the classroom and practiced in a variety of situations before the class undertakes a full-scale investigation project. Teachers can conduct discussions with the whole class or with small groups, eliciting ideas for carrying out any aspect of classroom activity. Students can help plan short-term activities that last only one period, or long-term activities. Anything from naming a goldfish to organizing a class trip or student council group is appropriate for cooperative planning.

**The Teacher's Role.** In a class conducting a Group Investigation project the teacher serves as a resource person and facilitator. He or she circulates among the groups, sees that they are managing their work, and helps out with any difficulties they encounter in group interaction and the performance of the specific tasks related to the learning project.

The teacher's role is learned by practice over time, as is the students' role. First and foremost, the teacher must model the social and communication skills expected from students. There are many opportunities in the course of the school day for the teacher to assume a variety of leadership roles, as in discussions with the entire class or with small groups. In these discussions the teacher models a variety of skills: listening, paraphrasing, reacting nonjudgmentally, encouraging participation, and so forth. These discussions can he aimed at determining short-term learning goals and the means to reach them.

No doubt some aspects of curricula may not be amenable to Group Investigation. Furthermore, the subtopics selected by the students for research need not be the only material that students study about a subject. The investigation of subtopics of the students' choice may be supplemented by the teacher's instruction of
other topics he or she feels are important. The teacher can then expand the unit by
direct whole-class instruction, individualized instruction in learning centers, or any
combination of methods. These lessons may be presented before, after, or during the
time the class is conducting Group Investigation (Cohen, 1986; Sharan and Sharan,

**Implementation**

In Group Investigation, pupils progress through six stages. These stages and
their components are outlined below and then described in detail. Of course teachers
will have to adapt these guidelines to their pupils' backgrounds, ages, and abilities, as
well as the constraints of time, but the guidelines are sufficiently general to apply in a
wide range of classroom conditions.

**Stage 1: Identifying the topic and organizing Pupils into Groups**
- Students scan sources, propose topics, and categorize suggestions.
- Students join the group studying the topic of their choice.
- Group composition is based on interest and is heterogeneous.
- Teacher assists in information gathering and facilitates organization.

**Stage 2: Planning the Learning Task**
- Students plan together:
  - What do we study?
  - How do we study? Who does what? (division of labor)
  - For what purpose or goals do we investigate this topic?

**Stage 3: Carrying Out the Investigation**
- Students gather information, analyze the data, and reach conclusions.
- Each group member contributes to the group effort.
- Students exchange, discuss, clarify, and synthesize ideas.

**Stage 4: Preparing a Final Report**
- Group members determine the essential message of their project.
- Group members plan *what* they will report and *how* they will make their
  presentation.
• Group representatives form a steering committee to coordinate plans for the presentation.

**Stage 5: Presenting the Final Report**

• The presentation is made to the entire class in a variety of forms.

• Part of the presentation should actively involve the audience.

• The audience evaluates the clarity and appeal of presentation according to criteria determined in advance by the whole class.

**Stage 6: Evaluation**

• Students share feedback about the topic, about the work they did, and about their affective experiences.

• Teachers and pupils collaborate in evaluating student learning.

• Assessment of learning should evaluate higher-level thinking.

**Stage 1: Identifying the Topic and Organizing into Research Groups.** This stage is devoted to organizational matters. The teacher presents a broad problem or issue (for example, understanding South America's geography, economics, and culture) and the students identify and select the various subtopics for study, based on their interests and backgrounds. This stage begins with classwide cooperative planning, which can proceed in several ways:

1. The teacher presents a problem to the entire class and asks, "What do you want to know about this problem?" Each student raises questions about the aspect of the problem he or she would like to investigate.

2. Students meet in buzz groups where each person expresses his or her ideas about what to investigate. A recorder in each buzz group writes down all ideas and then reports them to the whole class. A short class discussion results in a shared list of suggestions for subtopics to be investigated.

3. Planning begins with each student writing down his or her suggestions, and continues in progressively larger groups, from pairs to quartets or even groups of eight. At each step the group members compare their lists, eliminate
repetitions, and compile a single list. This final list represents the interests of all members.

The next step is to make all the suggestions available to the whole class. Teacher or students can do this by writing all the suggestions on the board or on newsprint hung on the walls, or by copying them and distributing a copy to each student. After each student has a list of everyone's suggestions, the class classifies them into several categories. This step can be conducted by one of the three methods just outlined. The resulting list, organized into categories that are presented as At subtopics for separate group investigation, incorporates the ideas and interests of all class members.

Participation in this stage enables students to express their own interests and to change ideas and opinions with their classmates. It is important for the teacher to allot the students to determine the parameters of the investigation by not imposing his or her own suggestions and by not rejecting pupils' ideas. Full, unhurried implementation of this initial planning stage demonstrates that the group learning process is based on individual members' experiences and needs. It is likely that in two classrooms investigating the same general topic, the subtopics would be different, reflecting the unique interests of the members of each class.

In the final step of this stage the subtopics are presented to the whole class, usually on the board. Groups are formed based on students' interests; each student joins the group studying the subtopic of his or her choice. The teacher may wish or limit the number of students in a group. If one particular subtopic is very popular, two groups may be formed to investigate it. Because of group members' different interests and needs, each of the two groups will produce a unique product, despite the common subtopic.

**Stage 2: Planning the Investigation in Groups.** After joining their respective research groups, students turn their attention to the subtopic of their choice. At this Stage group members determine the aspect of the subtopic each one of them (singly or in pairs) will investigate. In effect, each group must formulate a researchable problem, decide how to proceed, and determine which resources it will need to carry out its investigation.
Many groups find it useful to fill out a worksheet containing questions relevant to this planning stage.

OUR RESEARCH TOPIC

GROUP MEMBERS: (names)

WHAT DO WE WANT TO INVESTIGATE?

WHAT ARE OUR RESOURCES?

HOW WILL WE DIVIDE THE WORK?

The teacher can post a copy of each group’s worksheet in order to present graphic evidence that the class is a “group of groups.” Each student contributes to the small group’s investigation, and each group contributes to the whole class’s study of the larger unit.

Stage 3: Carrying Out the Investigation. In this stage each group carries out the plans it formulated earlier. Typically this is the longest stage. Although students may be given a time limit, it is not always possible to foresee the exact number of sessions they will need to complete their investigation. The teacher should make every effort to enable a group project to proceed uninterrupted until the investigation is accomplished, or at least until the bulk of the work is done.

During this stage students, singly or in pairs, gather, analyze, and evaluate information, reach conclusions, and apply their share of new knowledge to the resolution of the group’s research problem. Each student investigates that aspect of the group project that interests him or her most, and in so doing contributes one of the parts necessary to create a group “whole.”

When individuals or pairs complete their portion of the task, the group reconvenes and members share their knowledge. Members may also help each other and discuss their work while it is in progress. Groups may choose to have one member record their conclusions, or each member may present a written summary of his or her findings. Groups carrying out their first investigation, especially in the lower grades, may simply have each member present a short summary in response to the question that was to be investigated. With experience, this presentation of summaries becomes a problem-solving discussion.
**Stage 4: Preparing a Final Report.** This state is a transition from the date-gathering and clarifying stage to the stage where the group reports the results of its activities to the class. Primarily it is an organizational stage, but like stage 1 it also entails such intellectual activities as abstracting the main idea of the group’s project, integrating all of its parts into a whole, and planning a presentation that will be both instructive and appealing.

How does the class plan its final presentation? At the conclusion of the investigation stage the teacher asks each group to appoint a representative to a steering committee. This committee will hear each group’s plan for its report. It will collect all requests for materials, coordinate time schedules, and make sure that the ideas for presentation are realistic and interesting. The teacher continues in the role of advisor helping the committee where needed and ensuring that each group’s plan enables all members to be involved. Some groups determine the nature of their final report when they start their work. In others the plan for the final report emerges in stage 4, or it develops while the group is engaged in investigation. Even if groups do begin to generate ideas about their final report during the investigation phase, they still will require time for a systematic discussion of their plan. During this transitional planning session the pupils begin to assume a new role- the role of the teacher. Of course, students have been telling their groupmates all along about what they are doing and learning, but now they begin to plan how to teach their classmates in a more organized fashion the essence of what they have learned.

When the teacher meets with the steering committee, he or she may wish to highlight the following guidelines to help the groups plan their reports:

- Emphasize the main ideas and conclusions of the investigation.
- Inform the class about the sources the group consulted and how it obtained information.
- Allow for questions and answers.
- Involve classmates as much as possible in the presentation by giving them roles to perform; do not have them sit and listen for long periods.
- Make sure everyone in the group plays an important role in the presentation.
• Make sure all necessary equipment or materials have been requested.

**Stage 5: Presenting the Final Report.** The groups are now prepared to present their final report to the class. At this stage, they convene and reconstitute the class as a whole.

The students making the presentation must fill a role to which they are largely un-acclimated. They must cope not only with the demands of the task-ideas and procedures- but also with the organizational problems of coordinating the work and planning and carrying out the presentation. The following guidelines might prove helpful:

• Speak clearly and succinctly when addressing the class, but lecturer as little as possible.
• Use the blackboard to illustrate concepts.
• Use audiovisual equipment, such as an overhead projector.
• Conduct formal debates in front of the class if appropriate.
• Think of preparing learning stations where classmates can perform tasks prepared by the group.
• Consider dramatizing some portion of the work, or simulating certain events.
• Consider quiz programs as one way to get an audience interested.
• Consider displays of pictures, drawings, or photographs to liven up the presentation.

These final reports can afford an experience in which intellectual pursuits are accompanied by a moving emotional experience. All members of the class can participate in many of the presentations, by performing tasks or answering questions the presentations are not just a matter of performing rehearsed roles and reciting lines.)

**Stage 6: Evaluating Achievement**  Group Investigation challenges teachers to employ innovative approaches in assessing what pupils have learned. In traditional classroom instruction all students are expected to learn the same material and acquire a uniform set of concepts. The manner in which they are to demonstrate their understanding of the subject is also largely uniform. That such expectations are clearly inappropriate in Group Investigation reinforces the fear of some teachers that not every
pupil has actively participated or done his or her best and that in the absence of uniform evaluation these students will not be identified.

In Group Investigation teachers should evaluate students' higher-level thinking about the subject they studied—how they investigated certain aspects of the subject, how they applied their knowledge to the solution of new problems, how they used inferences from what they learned in discussing questions requiring analysis and judgment, and how they reached conclusions from sets of data. This kind of evaluation is best achieved through a cumulative view of the individual's work during the entire investigation project.

Group Investigation exposes pupils to constant evaluation both by peers and by the teacher more than does traditional whole-class instruction. The pupils ideas, grasp of a subject, and work investment are all very visible in this approach. In the traditional classroom, many students are never heard from until the final test. In the Group Investigation classroom, teachers should be able to form reliable student evaluations on the basis of frequent conversations and observations of the student's academic activity.

If resting is desired, the tests should take into consideration different levels or types of learning. Tests that focus exclusively on information gathering and recall are not likely to reflect the learning that actually took place. Pupils' affective experiences during their study also should be evaluated, including their level of motivation and involvement. Feedback from the pupils themselves should convey how they feel about the topic and about the work they did.

The teacher and pupils can collaborate in evaluating student learning. One possible suggestion is peer evaluation. The students and teacher cooperate in formulating an exam, with each research group submitting questions from all groups, would cover the entire topic the class investigated. Each group is given the pupils' written answers to the questions and must correct those answers. In this way the group becomes a committee of experts who must evaluate their classmates' achievement.

The teacher may wish to reconvene the steering committee to assist in the evaluation. For example, each research group might submit five questions, from which the teacher and the steering committee would select two. With seven research groups in the class, the final exam would consist of fourteen questions. In the
meantime, all pupils are given a copy of all the questions composed by the various groups and told that the exam will consist of fourteen of the thirty-five questions. The date for the exam is set for a week or two weeks later to give everyone time to prepare. During this preparation pupils must carefully review the material presented in the group reports, because the groups have prepared the exam questions on the basis of these reports. The pupils are free to discuss their answers with members of each research group after the exams have been returned to them. This examination can become an important learning experience for all involved.

Another approach to evaluation could have the students reconstruct the process of investigation and map out the steps they followed in their work. They should also analyze the way different groups contributed to each others progress. Each student might be asked to prepare a reconstruction of his or her own activities and write how this work complemented the work of other group members and contributed to the progress of the research group as a whole. This kind of evaluation is probably beyond the abilities of children in the early elementary grades and is more appropriate for those in sixth grade or higher. Reconstructive evaluation should help students develop a broad and critical perspective of their own study procedures and achievements, improving their ability to plan investigation projects in the future.

During the past fifty years, cooperative learning has been the least used goal structure in instructional situations. The use of cooperative learning has both its advocates and its critics. The disagreement may be resolved by (a) examining the research (Appendix) and (b) detailing the nature of constructive cooperative learning, the teacher’s role in implementing it, and the basic elements that make it work.

Class members are assigned to small groups (often heterogeneous) and instructed to (a) learn the assigned material and (b) ensure all other group members do likewise.

Cooperation may be extended to the class (by ensuring that everyone in the class has learned the assigned material) and the school (by ensuring that all students in the school are progressing academically) levels.

Students promote each other's success. Students discuss material with each other, explain how to complete the assignment, listen to each other's explanations, encourage each other to work hard, and provide academic help and assistance. This
interaction pattern exists between as well as within groups a criteria-referenced assessment and evaluation system is used. The focus is usually on the learning and academic progress of the individual student but may also include the group as a whole, the class, and the school.

1.18 ACADEMIC ACHIEVEMENT

Academic Achievement plays a significant role in almost all aspects of human life. It has assumed enormous importance in view of its practical value. It helps in shaping the career of individual and planning for the future education. It form the main basis of admission and promotion in a class. Therefore a good Academic Achievement record of a student is an index of an effective educational system. The term academic has been derived from the term academy. The meaning of word Academy is “a school where special types of instructions are imparted”.

According a Good (1959) the term academic means “pertaining to field of teaching subject, pertaining to liberal arts, pertaining to the realm of ideas of abstraction.

According to C.V. Good (1959) the meaning of the term achievement in accomplishment or proficiency of performance in given skills or body of knowledge. Academic Achievement is the core of wider term, education and perhaps non would non would deny the importance of academic achievements in child’s life. It is common observation that success in the scholastic subjects acts as an emotional tonic and any damage done to child in the home may be partially repaid by the success in school. High Academic Achievement builds up self esteem and self confidence which leads to better adjustment with the group. So Academic Achievement generally refers to the degree or level of success or that of proficiency sustained in some specific area concerning scholastic or academic work.

Trout (1964) contended that Academic Achievement of a child is knowledge attained, skill acquired and attitude develop by him in the subject in which he is imparted training in schools and subsequent success in life. The Academic Achievement is assessed by the school authorities with the help of achievement test.

Good (1959) refers to academic achievement as “The knowledge attained or skill developed in the school subjects usually designated by test scores or marks
assigned by the teacher or both. In more general term it means the achievement of pupil in so card academic subjects reading, writing, history etc. as contrasted with the skills developed in such areas as industrial arts and physical education.

**Trow (1960)** defines Academic Achievement as “the attained ability or degree of Competence in school in age or grade units based on norms described from a wider sampling of pupil performance”.

Academic Achievement is a complex phenomena in **Kerling’s (1969)** opinion, it is an abstraction formed from the observation of certain behaviors of children which are associated with the mastery or learning of school tasks, reading words, doing arithmetic problems, drawing pictures and so on.

According to **Christian (1980)** the word performance generally indicate the learning outcomes of the student. Achievement is the accomplishment or proficiency of performance in a given skill or body of knowledge.

**Robinson and Horrock (1966)** defined achievement as “status level or individual’s learning and his ability to apply what he has learned.

According is this definition achievement at first thought is to be assumed to include any knowledge or skill. There is, however, a much broader approach which includes attitude, interests and values as aspects of a achievement and achievement is defined as the product of learning attitudes and interests as they are learned retained and forgotten just as knowledge or skill is. According to **Crow and Crow (1956)** achievement means the extent to which learner and profiting from instructions from a given area of learning. In other words we can say achievement means the extent to which teaching and studying has resulted in mastery. It is the outcome of general and specific learning experiences. Academic achievement of a pupil refers to the knowledge attained and skills developed in the school subjects which are assessed by the school authority with the help of achievement tests which may be enter standardized or teacher made.

**Factors Influencing Academic Achievement** A multitude of factors affect the academic performance of an individual at any given time. These factors can be designated to two groups (1) Subjective (2) Objective.
Subjective factors include:

(1) Method of learning (2) Intelligence (3) Aptitude (4) Interest (5) Aspiration (6) Need achievement (7) Individual forces (8) Attitude towards peer, teacher, school and courses (9) Methods of study.

Objective factors are:

(1) Home & family background (2) Locus of control (3) Socio-economic status (4) Peer group relationship (5) Personality and ability of teacher (6) Evaluation processes (7) Reaction to school and achievement (8) Teaching methods.

1.19 RELATIONSHIP BETWEEN COOPERATIVE LEARNING AND STUDENTS' ACADEMIC ACHIEVEMENT

In a meta-analysis of 122 research studies from 1924 to 1980 that compared cooperation, competition and individualistic learning, Johnson and Johnson (1988) found that cooperative learning (CL) promotes higher achievement than competitive or individualistic learning. The results hold for several subject areas and a range of age groups from elementary school through to adult. They found that students with cooperative experiences are more able to appreciate the perspective of others, are more positive about taking part in controversy, have better developed interaction skills, and have a more positive expectation about working with others than students from competitive or individualistic settings.

Slavin (1980) reviewed 28 primary field projects lasting at least 2 weeks in which CL methods were used in elementary or secondary school. He concluded that:

1. For academic achievement, cooperative learning techniques are no worse than traditional techniques, and in most cases they are significantly better.
2. For low level learning outcomes, such as knowledge, calculation, and application of principles, CL techniques appear to be more effective than traditional techniques.
3. For high level cognitive learning outcomes, such as identifying concepts, analysis of problems, judgment and evaluation, less structured CL techniques that involve high student autonomy and participation in decision-making may be more effective than traditional individualistic techniques.
In the same review, Slavin found that structures like TGT (Teams Games Tournaments) showed relatively consistent positive results on student achievement, race relations, mutual concerns, and other variables. Research on STAD (Student Teams Achievement Divisions) further supports the positive effects of structured CL techniques on academic achievement and race relations (Slavin, 1980).

Slavin (1983) analysed 46 controlled research studies which were conducted for an extended time in regular elementary and secondary school classrooms. Among the studies examined by Slavin, 63% showed superior outcomes for CL, 33% showed no differences, and only 4% showed higher achievement for the traditional comparison groups. Achievement gains were found in almost all (89%) of the studies which used group rewards for individual achievement (individual accountability). When individual accountability was absent, achievement overall was about the same as in comparison classrooms. In another review, Slavin (1989) identified 60 studies that contrasted the achievement outcomes of CL and traditional methods in elementary and secondary schools and found that there is wide agreement among reviewers of the CL literature that cooperative methods can and usually do have a positive effect on student achievement. However, achievement effects were only seen for cooperative structures that incorporate positive interdependence and individual accountability.

The lowest achieving students and minority students in general benefit most but the benefit obtained for the lower achievers is not bought at the expense of the higher achievers; the high achieving students generally perform as well or better in cooperative classrooms than they do in traditional classrooms (Kagan, 1994).

1.20 STATEMENT OF THE PROBLEM

A STUDY OF THE EFFECTIVENESS OF STUDENT-TEAM ACHIEVEMENT DIVISION (STAD) AND GROUP INVESTIGATION (GI) METHODS OF COOPERATIVE LEARNING ON HIGH SCHOOL STUDENTS.

1.21 OBJECTIVES OF THE STUDY

1. To compare the mean achievement-scores of two groups of pupils taught Physics without the use of cooperative learning method (STAD) before the experimental treatment.
2. To compare the mean achievement scores of two groups of pupils taught Physics with and without the use of cooperative learning method (STAD) after the experimental treatment.

3. To compare the mean achievement scores of two groups of pupils taught Physics with and without the use of cooperative learning method (GI) after the experimental treatment.

4. To compare the mean gain achievement scores of two groups of pupils taught Physics without the use of cooperative learning method before the experimental treatment.

5. To compare the mean gain achievement scores of two groups of pupils taught Physics with and without the use of cooperative learning method (STAD) after the experimental treatment.

6. To compare the mean gain achievement scores of two groups of pupils taught Physics with and without the use of cooperative learning method (GI) after the experimental treatment.

1.22 HYPOTHESES

In terms of hypotheses, the objectives of the study would translate themselves as:

H$_1$: At the end of experimental treatment the group of students taught Physics through cooperative learning method Student-Team Achievement Division (STAD) i.e E-I score significantly higher on the achievement test than the group of students taught through the traditional method;

H$_2$: At the end of experimental treatment the group of students taught Physics through cooperative learning method Group Investigation (GI) i.e E-II score significantly higher on the achievement test than the group of students taught through the traditional method;

H$_3$: At the end of experimental treatment the group of students taught Physics through cooperative learning method Student-Team Achievement Division (STAD) i.e E-I shows a significantly higher gain score on the achievement test than the group of, students taught through the traditional method.
At the end of experimental treatment the group of students taught Physics through cooperative learning method Group Investigation (GI) i.e E-II shows a significantly higher gain score on the achievement test than the group of students taught through the traditional method.

1.23 OPERATIONAL DEFINITIONS

In the present study, a few terms have been frequently used that have got specific meaning for the present investigation. Given below are the operational definition of these terms.

i) Cooperative Learning

Cooperative Learning is the one strategy that can enable all the learner in the classroom to learn or work together which contribute to intellectual, social and psychological development of the learner. In the present study out of widely used cooperative learning methods given by Slavin (1996), two methods i.e. Student-Team Achievement Divisions (STAD) and Group Investigation (GI) has been used.

ii) Academic Achievement

The meaning of the term achievement in accomplishment or proficiency of performance in given skills or body of knowledge. Academic Achievement is the core of wider term, education and perhaps non would non would deny the importance of academic achievements in child’s life. It is common observation that success in the scholastic subjects acts as an emotional tonic and any damage done to child in the home may be partially repaid by the success in school. High Academic Achievement builds up self esteem and self confidence which leads to better adjustment with the group. So Academic Achievement generally refers to the degree or level of success or that of proficiency sustained in some specific area concerning scholastic or academic work given by C.V. Good (1959).