DESIGNING GROUPWORK

Strategies for the Heterogeneous Classroom

SECOND EDITION

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evaluating some individual products of groupwork and by testing students for their grasp of the basic concepts the group tasks were designed to teach. Properly designed groupwork can produce major gains, even on standardized achievement tests.

A WORD ABOUT TIME

After making detailed plans, it is necessary to estimate how much time each phase will take. How much time will be needed for pretraining? Will the students have time for their first groupwork experience after the orientation? If the orientation goes on too long, the students will be frustrated by having to end the groupwork too early, or there will be no time for wrap-up. Planning groupwork for 50-minute periods in middle and secondary schools is particularly challenging. Teachers often decide to devote one period to orientation and a general warm-up activity. They devote the second period to the groupwork, along with the preparation of individual reports, and the third period to presentations and wrap-up. Making a realistic time schedule for each phase (and sticking to it) is an indispensable management tool.

6 Giving Everyone a Part to Play

Here are two illustrations of groupwork in which students play different parts. The first is a group of five fourth-grade students from an academically and ethnically heterogeneous classroom using complex instruction. The facilitator is reading the activity card with instructions on growing a salt crystal garden.

Facilitator: "What kind of changes do you see? Write what kinds of changes you see on your worksheet. If the base dries up add 2 tsp. of water and 1 tsp. of ammonia." OK? Do you understand what we are supposed to do? [The group smiles and nods. The facilitator places the activity card face down.] OK. What is the name of the center? [Group laughs. Several members raise their hand, and the facilitator recognizes one girl.]

Girl: Salt Crystal Garden?

Facilitator: You got it. [Puts card back in plastic box and directs the materials manager to hand out materials. The manager lays out the materials and hands out role badges to the facilitator, the person in charge of clean-up, and the checker who checks to see if all the worksheets are done.]

Materials Manager: Who is the reporter?

Reporter: I am. [He takes the role badge offered by the materials manager. The group spends about five minutes looking at the pictures on the activity card and working with the materials.] Hey you guys, before you begin, I have to write down the answers to this question on the reporter worksheet: What do you predict will happen in this science experiment? And don't just tell me what

you predict. I have to write down why you made this prediction. [The group, hesitantly at first but more excitedly as they go on, begins to talk about how they think salt crystals will form, just like in the picture.]

The second illustration is from the written report of a team of beginning high school teachers. One of the pair worked as the teacher and the other functioned as observer. The observer is reporting on Mike Leonard's class in Geometry, a lower track mathematics class.

> This is a casual and friendly group of students who appear to relate well to each other and to their teacher. Mr. Leonard begins the lecture with a short review of last night's homework. This work covers skills needed in today's groupwork. He uses an overhead projector; the class has many questions. Mr. Leonard then goes over the assignment. Each member has at least one equation of a line for which he or she must find three ordered pairs in the relation, draw the graph of the relations, find the slope of the graph and find the y intercept of the graph. The group has the responsibility of writing an explanation of the y = ? Mr. Leonard has placed graph paper and a straight edge on each desk before class.
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> He now reads and explains information written on the board. This includes a list of behaviors expected in the role of facilitator: (1) makes sure everyone participates; (2) makes sure task is completed in 20 minutes; (3) gets help from teacher if entire group cannot answer a question.
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> The groups have been prearranged so that students already know their group and their location. The facilitator's role is a rotating one; and today's facilitators are given tags to indicate their special function. One person has the role of grapher who must graph all equations on one set of axes and label them neatly.
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> Next, Mr. Leonard asks the students to get into their groups and begin work. It is apparent that he has trained his students well beforehand because it takes less than a minute for all the students to be in groups and involved in the task. Once in their group, certain students are still unclear as to what the task involves, but other members explain it to them. All the students certainly seem to be engaged in their work. Even those that Mr. Leonard has described as "academically weak" seem involved and active. Some students need help in understanding how to find ordered pairs and in graphing lines; they receive explanations from other members of the group. The facilitators start out by leading, but as time goes by the other students are doing as much directing and "facilitating" as the person assigned to that role.
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> The students begin by clarifying the task among themselves and by choosing someone to play the role of the grapher; they then move into their separate tasks, working out their lines and points. The graphers are interested in pushing everyone to complete and pass the graphs on to them so that they can finish their job. In the last phase, the collective group discusses an explanation, while the graphers produce their summary graph. The assignment is done in twenty minutes. Mr. Leonard now puts up on the board the graphs from the groups—all are correct. He writes the equations on the board and proceeds to ask questions. Interestingly, several groups are able to give variations on the correct answers. This takes ten minutes, and there are still five minutes left to hand out a review sheet for the test tomorrow and an evaluation questionnaire on the groupwork. (Kinney & Leonard, 1984, pp. 9–12).

EFFICIENT AND EFFECTIVE GROUPS

How do the groups in these two illustrations avoid problems of nonparticipation and interpersonal difficulty? The secret of their success lies partly in their teachers' careful planning and preparation and partly in the way members have something specific to do. When each person's job is given a name and is accompanied by a list of expected behaviors, group members have been "assigned specific roles to play." Members feel very satisfied with their part in the group process in groups with different roles and/or jobs to do; such groups can work efficiently, smoothly, and productively. The use of roles alleviates problems of nonparticipation or domination by one member.

In the case of complex instruction, notice that the roles students play, such as facilitator and reporter, are not parts of the task that the activity card describes. Instead, these roles relate to *how the work is to be done*. For example, the facilitator is checking for understanding of the activity card and the reporter is stimulating scientific thinking and discussion about the task. I refer to these as the "how" roles. In addition to playing a "how" role, everyone must function in the discussion of the task, in the creation of the group product, and in filling out an individual re-

port. Through the assignment of "how" roles, the teacher delegates to group members many of the tasks that the teacher ordinarily does: keeping the group on task, insuring good social relations, organizing and clean-up, and summarizing what has been learned for the class as a whole.

When each group member is doing a part of the job, there is a *division of labor.* Mr. Leonard's assignment is an excellent example: each student has to do one equation, but the results of all equations are necessary to the final product. When a specialized part of the assigned task has a name and specific expectations for behavior, I call it a "what" role. "What" roles refer to the substance of the group's assignment as opposed to how the group goes about its business. The grapher is an example of a "what" role; in order to complete the task the grapher has to take everyone's equation and graph it into one final product. Notice that Mr. Leonard combines this with the "how" role of a facilitator who makes sure that everyone participates, sees to it that the job gets done on time, and seeks the teacher's help if necessary.

"HOW" ROLES

The roles used in complex instruction helped to insure a high-quality discussion and a group product that was on track and on time. By having a materials manager, only one person needed to move about the classroom gathering construction materials for the group. The clean-up person directed the group in wiping down the table so that the teachers did not have to pick up after the children. The facilitator helped those students who could not read the instruction card and saw to it that people carried out their roles. Finally, the reporter, by requiring the whole group to discuss what he would report to the class, ensured a thoughtful presentation based on a thorough exchange of ideas.

Leadership Roles

There are advantages to the use of leaders. In the adult world of work, there are very few leaderless groups. When one

person is an appointed leader, there is less jockeying for influence among the members than in leaderless groups because the status order is clear (the leader is in charge); the leader is seen as legitimate, that is, backed up by higher authority. When every decision does not have to be made by consensus, the group's operation is quicker and more efficient.

The teacher has it well within his or her power to appoint group leaders for each of the collective task groups. Furthermore, the teacher has the authority to say exactly what the group leader has the right and duty to do with respect to the group.

From an educational point of view, the use of a strong leader has some drawbacks. Group members may have very little to do with each other and may simply respond to the leader's directions. If the task involves a group discussion, a strong leader is likely to dominate. Members will tend to listen more to the group leader concerning the content of the task, even though other group members may have more valuable ideas. Furthermore, if the leader is constantly saying whose turn it is to talk, the amount of interchange between group members is greatly reduced. A leader with the power to direct discussion and to make final decisions will often cause the group to give up and to let the leader do the whole task.

Limited Leadership Techniques

How can a teacher gain the efficiency of a leader without sacrificing the active learning that takes place during creative interchange? If the leadership role is properly structured, one can have the benefits of creative interchange and the efficiency of a leadership role for a short- or long-term task.

A facilitator who acts as a limited leader is not a boss with executive decision-making rights. Everyone in the group understands that the facilitator does not have control over the decision or the content of the discussion. Instead, the role is limited to functions such as seeing to it that everyone participates, keeping the group on task and away from irrelevancies, and/or making sure that the group makes clear decisions in the time the teacher has allotted. Facilitator roles can be tailor-made for particular tasks and classes.

The use of such a limited leadership role has the advantage of efficiency because one member is in charge of the group process. It has the added advantage of preventing status struggles and domination by members of the group who have high academic or social standing. No doubt something in the way of a free and full exchange of the well-trained leaderless group is given up, but like so many decisions in designing groupwork, there is a tradeoff in the relative advantages and disadvantages of each strategy.

Research on complex instruction has demonstrated that the use of facilitators boosts the rate of talking and working together in the group (Zack, 1988). When the facilitator asks if everyone understands the activity card, the group often engages in a good discussion of what they are supposed to do and what strategies they will employ. Also, conversations will take place as help is delivered so that people are not left on their own to struggle with the task.

Group Harmonizer

A group harmonizer can ease interpersonal conflicts that arise, can be attentive to the feelings of individual members, and can encourage members to compromise and discipline themselves to help maintain the group. You can adapt the harmonizer role differently for different age groups. The youngest students may only be able to comment favorably on other's ideas. The version of the harmonizer role that we use in the middle school includes the following responsibilities: Make sure communication lines are open; do not allow "put downs"; encourage positive responses.

Roles for Older and Younger Students

With more mature groups who have the task of synthesizing individual productions into a written or oral report, an excellent specialized role is that of summarizer (or synthesizer). The summarizer works with a chalkboard or butcher paper in front of the group, noting key ideas under discussion. The summarizer is not merely recording; he or she leaves out irrelevant issues

and highlights disagreements between ideas that will need to be resolved. The advantage of this role is that it tends to depersonalize disagreement; the argument is between *ideas* rather than between individuals who proposed the ideas. The group gains objectivity, and those who are unwilling to say negative things about each other's ideas face-to-face are able to be objectively critical when faced with ideas-separate-from-persons.

Another useful role for older students is that of resource person, who is responsible for helping the group to use the materials relevant for discussion. I often plan a lesson around a mini-lecture accompanied by a handout concerning the major concepts. In the groupwork task that follows the lecture, the groups are asked a series of questions that requires them to use and to apply the concepts. The resource person uses the handout, often searching out answers to questions raised by the group during the discussion. In this group design I also employ a facilitator, a spokesperson, and a synthesizer. In other designs, the resource person can look up relevant information in reference works and/or the textbook.

A recorder can provide the group with notes or a diagram from the discussion. This is particularly useful in helping individuals finish their reports as well as in creating the group report. The recorder can also make sure that everyone completes an individual report.

The reporter is a frequently used role for younger and older groups of cooperative learners, but rarely achieves its full potential. Unless the role is properly developed, the reporter struggles, in the final minutes of group activity, to think of what to say. The resulting product may be so scanty that the class has no clear idea about what this group discovered. Or the report may bear little resemblance to the actual conversation of the group. Teachers often complain that reports are boring and repetitive and that the class is restless and inattentive.

For a successful report, it is necessary that the reporter hold a discussion with the group about what is to be said. The group may decide that several people should participate in the report. The reporter who lacks self-confidence or proficiency in English may request that other group members accompany him or her to the front of the room to assist. If the group product is a role

play or the presentation of a concrete construction, the reporter may act as announcer or narrator, briefly summarizing the activity to introduce the presentation to the class.

In a study of the reporter role, Ehrlich (1991) experimented with stopping the group for a formal discussion similar to that held by the reporter in the first illustration in this chapter. The reporters were given a special worksheet and time to discuss with the group the answers to a set of questions in preparation for their report to the class. The enhanced reporter's job was to encourage the group to think and talk together, and as a group, to answer questions on the special form. These questions were timed at the beginning of the task, in the middle, and at the end. They were designed to encourage science-thinking behaviors. For example, the group was asked to specify their predictions for the science experiment, their observations, the inferences from their observations, and the extent to which their predictions were supported by their observations. Fourth-grade classes receiving this treatment were compared with classes using the same curriculum and techniques for cooperative learning, but with no special preparation or worksheet for the reporter role. Classroom observations revealed that students interacted more frequently when they used the reporter form than when it was absent. On a criterion problem-solving task at the end of the year, groups from classes that had experienced the enhanced reporter role demonstrated more science-thinking behaviors. These behaviors included asking thinking questions, requesting justification, predicting, hypothesizing, inferring, and concluding. Ehrlich felt that fourth graders were the youngest students who could manage these challenging discussion questions.

Young children love to play roles that entail clear responsibilities. Children preparing a salt crystal garden at the start of this chapter illustrate the set of roles used by teachers of second through fifth grades for *Finding Out/Descumbrimiento*, a bilingual curriculum designed by De Avila and Duncan (1980), to develop thinking skills. The system of classroom management I created for this approach was the initial version of complex instruction: heterogeneous groups of four or five children assigned to each of five or six learning centers. All classrooms use facilitators;

teachers select from the other roles on the list below to suit their own situations:

Facilitator: Sees to it that everyone gets the help he or she needs to do the task; is responsible for seeking answers to questions within the group; teacher is only queried if no one in the group can help.

Checker: Makes sure that everyone has finished his or her worksheet, answering all the questions.

Set-Up: Is responsible for setting up all the materials at the learning center. These are stored in such a way that a child can easily gain access to the materials needed. Pictures help to tell the child which materials will be needed and where they will be placed.

Clean-up: Is responsible for putting away materials properly and wiping off the table.

Safety Officer: Is responsible during tasks involving heat or sharp edges for supervising others and for notifying adult of potentially dangerous situations.

Reporter: Is responsible for telling what the group found out during the wrap-up.

DIVIDING THE LABOR

There are so many ways to divide up the work within groups and between groups that the actual limit is set only by the teacher's imagination. To provide an idea of the possibilities, let me present three examples.

Constructive controversy, developed and evaluated by the Johnsons (Smith, Johnson, & Johnson, 1981; Johnson & Johnson, 1985), illustrates a method in which an elaborate use of "what" roles and shifting division of labor successfully foster higher level discussion leading to conceptual understanding. In one study of constructive controversy, students worked in four-person groups over several classroom sessions. First, two-person pairs, having been provided with relevant information, prepared opposing sides of a debate concerning conservation vs.

economic interests on the proposed reintroduction of wolves into Minnesota. Within the pairs each student played a relevant role, such as farmer or rancher. Second, the pairs presented their opposing sides. The opposite pair was motivated to listen very carefully because the third phase required the pairs to switch sides and argue, using the information that had been presented. In the final phase, the entire group had to arrive at a consensual view of the issue and to write a group report. In quality of discussion and on a test of understanding, this method was found to be superior to either conventional debate or simple discussion groups.

A second possibility is the expert technique: Divide the class into groups with each group asked to prepare the answers to a different set of study questions. Students are told that they must make sure that each person in the group will be able to function as an expert on the answers to their set of questions in the second phase. For the second phase, divide up the experts so that there is one expert for each set of questions in each group. Then instruct the group to go over all questions, with the resident expert acting as discussion leader for his or her set of questions. This is an adaptation of Aaronson's Jigsaw Method (1978). I would recommend it only for classes where students are fairly secure in reading skills. Otherwise, an "expert" may experience public failure because he or she cannot really master the study materials.

As a third possibility, break up the task so that each person plays a different and complementary role; a technical group such as an airplane crew or an operating room team operates in this way. People work together very closely, but each has a different job to do—all examples of "what" roles. I used this method with success at the Center for Interracial Cooperation, a summer school where students made movies in interracial groups (Cohen, Lockheed, & Lohman, 1976). The roles were divided into camera person, director, story writer, actor, and so forth. Over the weeks of the summer school, each student played every role. For the interracial situation this technique had the great advantage of teaching the students that if given the chance to play a specialized role, different people can make very different and creative contributions to the group.

Dividing the labor and the use of "what" roles have two special problems. The first is that of getting help for the persons who cannot play their specialized role unaided. Many teachers try to solve this problem by selecting those students who have already shown special talents for particular roles such as story writer or actor. However, this strategy has the unfortunate effect of pigeonholing people and not allowing them to expand their repertoire through trying new roles. The second problem is that of maintaining group interaction and an exchange of ideas. If everyone is doing their job, there may be no basis for interaction.

The technique of constructive controversy uses roles such as rancher and farmer, but each side of the controversy works in complementary pairs to use written materials and to build a case. Thus, a poor reader could receive assistance. Secondly, the group has a final integrating phase in which everyone collaborates equally to propose a final report, thus solving the problem of insuring interaction.

In the second example, the expert group provides assistance to any member who is not confident of playing the expert role for the second phase. The group rehearses some of its members if necessary. Thus no one who is supposed to be "expert" is left to flounder. Although students play specialized roles as experts on particular questions in the second phase, they work together as a leaderless group in the first place, thus insuring exchange of ideas.

In the third example of the movie crew, the task is one in which the roles work very interdependently. They must interact extensively while they work and while they view the results of their attempts at filming. Moreover, the roles rotate so that no one is pigeonholed as an actor or as a camera person.

ASSIGNING ROLES

How can you make sure that students will accept roles that you assign and will be willing to play them? There are three things you must do to insure the effectiveness of any assignment of roles:

1. Make your assignment of the job to a specific member of each group public knowledge—everyone must clearly know that you have given this person the authority to act as facilitator or reporter.
2. Specify exactly what the person playing the role is supposed to do.
3. Make sure that everyone knows what the role player is supposed to do.

Try writing out the prescribed behaviors for each role on a large card and post them on the walls. This will help to clarify the role; it will also make everyone understand that the facilitator (or any other role player) is only doing what the teacher has directed. When this is done, even the meekest student will be willing to step forward and be a facilitator if you ask, and group members will treat that person with respect.

Strong, clear assignment of roles is particularly important for leadership roles. Suppose the facilitator tries to quiet down someone who is doing too much of the talking: "I think the group understands what you've been saying; we need to hear some other ideas." Unless the target of this remark understands that the job of facilitator involves giving everyone a chance to contribute, he or she is likely to view such a remark as a personal insult. The object of all this clarity, specificity, and publicity is to have group members understand that the leader is behaving in a certain way only because he or she is expected to do so as part of the job.

In selecting students for leadership positions, don't try to pick people on the basis of "leadership quality." Give everyone a chance to play the role of facilitator at one time or another. Because teachers often believe that few students have the capacity for leadership roles, they tend to pick the most successful student or the most popular or athletic student. Natural social leaders are also picked for a very practical reason: Teachers are sometimes afraid that unless they win over such students, they will be a source of trouble during the groupwork.

It is true that under ordinary classroom and playground conditions only a few students are capable of persuading others to do as they say. But the conditions in groupwork are different

in important ways. The facilitator does not have to assert leadership in an informal group. Instead, he or she has been *assigned* to play a specific role in a specific group by the teacher. Under these conditions a student with ordinarily low or middling status in the classroom will have little difficulty in guiding a group. If the role is clearly and publicly defined, and if students are properly prepared for any skills that will be called for (see below), a wide variety of students can be excellent facilitators.

The opportunity to play such a role is a much-needed boost to the status of many students in the classroom who are seen as meek, mild, or incompetent. It is especially important that girls get the chance to play leadership roles; very few girls are spontaneously seen as leaders by teachers or by peers (Lockheed, Harris, & Nemceff, 1983). When girls were given the chance to play the role of facilitator in cooperative learning, Leal (1985) found that girls were just as likely to be seen as leaders as boys. When there are only a few minority students, appointing one of them to play a leadership role is important in combating the sense of powerlessness they may feel in a classroom with few students like themselves and in a school with few teachers or administrators of their racial or ethnic background.

When a low status student attempts to play the role of a facilitator, you will sometimes see group members literally take the role away and play it themselves. Watch out for this occurrence, and be careful not to let it happen. Hold students accountable for playing their own roles. It is easier to do this when everyone is wearing a badge indicating their particular job in the group. Then you and everyone else knows who is supposed to be doing what.

If you let the group choose their own roles, they will tend to give whatever they perceive as the most desirable and powerful role to the student with the highest status. Since you don't want to reinforce the status order that already exists in your classroom, this is obviously not a good idea. Make it clear that everyone gets a chance to play every role through systematic rotation of jobs. The easiest way to do this is through the use of a chart (described in the last chapter) where the labels of rows represent the various roles. Students can see that you are systematically moving their name card down the chart with each

new group assignment, so that they play new roles each time, although the other members of the group may vary.

DEVELOPING ROLES

Roles have become very popular with teachers who use cooperative learning. However, on my classroom visits and when I observe groups in my own classes at the university, I often find that people are not playing the assigned roles. Why does this happen? Teachers often fail to check, as they move around the room, on whether or not roles are being played. Also, students don't feel comfortable and able to behave in the new and different ways specified for their position. Roles take much more development and learning than teachers imagine.

The younger the student, the more time it takes to develop clarity and skills for these roles. Younger children have had much less experience in playing a variety of roles than older students and adults. Playing these roles is related to drama; therefore it helps if students have some standard phrases to get started. For example, a facilitator can say, "Does everyone understand the activity card?" A harmonizer can ask if everyone feels OK about the decision the group has reached. In an initial discussion of roles, the class can develop some scripts under your direction. Students need a chance to practice these new behaviors, so you can have students pretend they are in groups and practice their roles.

Furthermore, these roles must be discussed and reinforced in the wrap-up following each session. Observe how people are playing their roles and take notes as you move around the room. Raise issues for class discussion based on your notes; bring out good examples and examples illustrating the need to develop some alternative strategies. Write the new strategies down and provide practice opportunities. And do not be afraid to point it out if people are not playing their roles and to ask the group to take care of this problem.

Training Facilitators

Suppose that you want a facilitator to ensure a rich discussion. Typical fifth graders do not have a clear idea of what a good discussion is, nor do they have many tactful strategies for persuading group members to change their behaviors. Therefore, unless you are sure they have the skills, it is wise to train the potential facilitators to carry out their jobs.

Wilcox (1972) demonstrated that it is possible to train fifth- and seventh-grade students from inner-city classrooms to be successful facilitators. In her study, students in groups with trained student leaders were significantly more active than students in groups with untrained student leaders. The results with untrained student leaders were highly variable; some looked as good as groups with trained student leaders while the techniques of others left much to be desired.

She chose student leaders who were neither the most nor the least socially powerful members of their classrooms. Those students selected as trained student leaders were given the job of helping the group in meeting the three criteria for a good group discussion: Give everyone a fair turn; Give reasons for ideas; Give different ideas. During the initial training session groups leaders were told the following:

> "There are different ways a person can be a leader. Different people have different ideas about what it means to be a good leader. Some people think being a leader means telling everyone what to do practically all the time. Some people think a good leader means letting everyone do just as he pleases—not interfere with their fun. And some think—and this is my idea too—that a good leader is in between these two. I think being a good leader means being part of a good group—talking with the other members—letting everyone tell his ideas—being just like the other members—so long as everything is going okay.
>
> But if things are not okay, then the good leader knows how to help his group. When wouldn't things be going okay? (Children may suggest, and if not, trainer mentions the silent group, the non-participator, the monopolizer.) If someone in the group never gives anyone else a chance to talk—or if one person doesn't talk—a good leader can help by asking questions—or reminding the big talker that someone else needs a chance. We'll talk about how to do this without making others angry. But remember—the good leader uses these ideas only when they're needed. Most of the time the good leader is just like everyone else in the group listening and taking turns talking." (Wilcox, 1972, p. 145)

Wilcox rehearsed with the leaders how they could get the group to adhere to the criteria. The students then role-played a discussion such as they would lead. They were directed to stop the group discussion after about five minutes and ask members to evaluate how well they were doing by the criteria on the suggestions chart.

Note the way Wilcox stressed a limited leadership role, so that the student leaders would not become dominant, particularly in the area of the final group decision. She made sure they would recognize undesirable leader behavior by making a special training film, but there are less elaborate ways to accomplish this objective. One might role-play the leader who dominates the group discussion, or ask one of the students to play this role, or one might tape record a simulated session with an overly dominant facilitator.

This is not the only way to train facilitators. However, it does illustrate the importance of clearly defining the role and carefully preparing new skills. Regardless of the age of the students, the instructor should always try to achieve this kind of clarity and should stop to analyze whether or not appointed facilitators have the skills necessary to carry out the role.

LONG-TERM PROJECTS

For long-term projects, it is possible to use leaderless groups for selected phases. Keep in mind that consensus groups with no formal leadership and no division of labor are very costly in terms of interpersonal relations and the level of social skills required. They are likely to exhibit status problems where one person dominates the group or status struggles in which several persons grapple for dominance. Therefore, only short-term use of such leaderless groups is recommended.

If the project is long-term, one possibility is to pull out those stages or phases of the task in which exchange and creative problem solving are most critical. These particular stages can have a leaderless group structure, while all the rest of the project can benefit from combinations of division of labor and special roles for different group members, including leadership roles.

Recall that creative interchange will not be accomplished without some sort of special training and socialization of norms for behavior during group discussion.

Two of the stages of a long-term project that benefit from creative interchange are the initial planning session and the integration of the final product. Obviously the project's outcome is largely determined by the depth of the analysis of the problem and the quality of decisions. If the students are discussing a social studies project on Pueblo dwellings, their final report or presentation is only as good as their analysis of which important materials are to be gathered and which activities are to be carried out by individual group members. At a more advanced level of scholarship, if the group is asked to do some library research on one aspect of a particular theme in order to write a group paper, the quality of that paper is dependent on the initial intellectual analysis.

In addition to this primarily intellectual reason for desiring a thorough and open discussion of the initial plans for the project, there is an important social–psychological reason for making everyone an equal and full participant in the initial planning phase. Unless members feel that they have a strong stake in the decisions made, they are likely to lose motivation when difficulties develop in carrying out their tasks. If, in contrast, all feel that they have had a fair chance to contribute to initial plans and have accepted the group's decision after arguing the issue fully and accepting or compromising in some reasonable fashion, there will be fewer if any members who let the group down by failing to do their jobs. Other members will feel free to say, "You took part, and you agreed that this was a reasonable way to do the job. So now you have to do your part!"

When the pieces of the final product have been assembled, the group is ready for another phase that requires an open interchange. A leaderless group can be used once again at this time. Particularly if the group has been through a period where members have been on their own, researching or creating materials for the final product, the group needs to learn what each member has found out. Although some of this process can take place through reading and examining the production of individual members, major intellectual benefits come from evaluat-

ing, analyzing, and synthesizing what each person has learned. This discussion can cause the group to look at the problem in new and different ways. Integration is a challenging task intellectually as well as interpersonally. Criticism and evaluation from others are never easy to take, but they are essential for a good final product.

During the middle phase, when the labor has been divided, people can go about their business in a fairly independent way. At this stage, it is desirable to have a leader who acts as a center for group communication and who keeps everything moving forward.

Group Investigation

Group investigation, developed by Sharan and Hertz-Lazarowitz (1980), is the most sophisticated method for long-term projects using planning groups, division of labor, and "how" roles for group management. Repeated evaluations in heterogeneous classrooms have shown that it is particularly effective in teaching concepts requiring higher level cognitive skills and in producing more cooperative and altruistic behavior (Sharan, Hertz-Lazarowitz, & Ackerman, 1980; Sharan & Shachar, 1988). More recently, Yael and Shlomo Sharan (1992) have prepared a book on this method for teachers.

In group investigation, students act as creative research scholars, producing their own knowledge. In order to achieve these goals, they must work together closely. Good group process is insured in various ways: building commitment to the group and its project, use of division of labor, and group process skills. If your objective is to enable students to create their own knowledge, and if you have been successful on short-term tasks with skills for group process and with the use of "how" roles and the division of labor, you may wish to plan such a long-term project. Be forewarned that group investigation demands the combination of all these strategies as well as skillful support and supervision by the teacher.

7 The Teacher's Role: Letting Go and Teaming Up

Question: What is your most important insight about teaching that you wish you had known during your first two years of teaching?

Answer: To let kids do more and me do less. This has been a hard lesson to learn over the years. I use a lot of cooperative learning, hands-on activities, and inquiry in the class and it was difficult for me to learn to step back and let it all happen. (Paul Martini, Woodside High School science teacher, Woodside, California)

Groupwork changes a teacher's role dramatically. No longer are you a direct supervisor of students, responsible for insuring that they do their work exactly as you direct. No longer is it your responsibility to watch for every mistake and correct it on the spot. Instead, authority is delegated to students and to groups of students. They are in charge of insuring that the job gets done, and that classmates get the help they need. They are empowered to make mistakes, to find out what went wrong, and what might be done about it.

This does not mean that you have given up your position as an authority in the classroom. On the contrary, you are the authority who gives directions for the task; you set the rules; you train the students to use norms for cooperation; you assign students to groups; you delegate authority to those students who are to play special roles; and, most important, you hold the groups accountable for the product of their work. This chapter