

Group Investigation Expands Cooperative Learning

Group Investigation harnesses students' individual interests and gives them even more control over their learning than other cooperative learning methods do.

In Group Investigation, students take an active part in planning what they will study and how. They form cooperative groups according to common interest in a topic. All group members help plan how to research their topic. Then they divide the work among themselves, and each group member carries out his or her part of the investigation. Finally, the group synthesizes and summarizes its work and presents these findings to the class (Joyce and Weil 1972, Sharan and Hertz-Lazarowitz 1980, Miel 1952, Sharan and Sharan 1976).

This method grew out of our interest in Thelen's (1960) group investigation model, "which attempts to combine in one teaching strategy the form and dynamics of the democratic process and the process of academic inquiry" (Joyce and Weil 1972). The basic features of Group Investigation are presented, in an early form, as "small group teaching" (Sharan and Sharan 1976). Sharan and Hertz-Lazarowitz (1980) refined the method and shaped its present form.

Stages of Implementation

Group Investigation is an effective organizational medium for encouraging and guiding students' involvement in learning. Students actively share in influencing the nature of events in their

classroom. Also, by communicating freely and cooperating in planning and carrying out their chosen topic of investigation, they can achieve more than they would as individuals. The final result of the group's work reflects each member's contribution, but it is intellectually richer than work done individually by the same students.

In planning and carrying out Group Investigation, students progress through six consecutive stages. These stages can be compressed into a week or two, or they can be carried out over several weeks or even months, depending on the scope of the topic under investigation and the skillfulness of the students and the teacher.

The topic should be a multifaceted one, so that it will trigger a variety of reactions from the students.

Stage 1. Identifying the topic to be investigated and organizing students into research groups.

STEP 1. This exploratory step may take two or three class periods. The teacher presents a broad topic to the whole class. The topic may be part of the curriculum or may stem from the students' interest or from a timely issue. Teachers should phrase the topic as a question: instead of presenting the topic "Arizona Indians," for example, the teacher should ask, "What can we learn from Arizona Indians?" or "How do Arizona Indians differ from Indians in other states?" This phrasing serves two purposes: it helps to define the scope of the investigation, and it sets the tone for inquiry.

The topic should be a multifaceted one, so that it will trigger a variety of reactions from the students. At this point, students are not expected to show what they know but what they *want* to know. Some students will ask questions based on their reading; others may ask questions related to their past experiences. If the teacher encourages diverse reactions, everyone will participate. Teachers should avoid imposing their own suggestions or rejecting students' questions.

The teacher can further stimulate inquiry by having students scan a vari-

ety of sources: films, texts, picture books, magazines, articles, and so on. These materials might be displayed on a table so that students can examine them whenever they have free time. Perhaps a lecture on the subject or a visit to a particular site would be helpful—anything to acquaint students with the subject and stimulate their interest.

STEP 2. Now the students are ready to formulate and select various subtopics for inquiry. The teacher writes the general topic on the board and asks: "Now that you've looked at some of the references about this topic, what do you think you want to investigate in order to understand it better?" Selection of subtopics is done by cooperative planning, which can proceed in one of several ways (Gorman 1969, Miel 1952, Sharan and Sharan 1976):

- Each student raises questions that he or she would like to investigate. The teacher writes each suggestion on the board; or

- Students meet in buzz groups (four or five per group), and each group member expresses his or her ideas about what to investigate. Recorders in each group write down each idea and then report them to the whole class. A short class discussion results in a shared list; or

- Each student writes down his or her questions. Then planning continues in progressively larger groups, from pairs to quartets to groups of eight. At each step students compare their lists, eliminate repetitions, and compile a single list. The final list represents the interests of all participants.

STEP 3. The teacher makes all the suggestions available to the whole class, either by writing them on the board or by duplicating them and distributing a copy to each student.

STEP 4. The next step is to classify everyone's questions into several categories. This can be done by adapting one of the three methods outlined in Step 2. The categories are then presented as the subtopics for separate groups to investigate.

STEP 5. The titles of the subtopics are presented to the whole class. Then each student joins the group studying the subtopic of his or her choice. The

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teacher may wish to limit the number of students in a group or, if a particular subtopic is very popular, to form two or more groups that will investigate it.

Stage 2. *Planning the investigation in groups.* Upon joining their respective groups, the students turn their attention to the subtopic of their choice. Together they formulate a researchable problem and plan their course of action. Group members determine which aspect of the subtopic each one of them, singly or in pairs, will investigate. In effect, each group has to devote an hour or two to its internal organization. Members have to decide how to proceed and what resources they will need to carry out their investigation.

As the teacher circulates among the groups, he or she can offer help to those who need it. Perhaps one group is unhappy with their original plan. Instead of insisting that the group stick to a plan that has proven uninteresting to them, the teacher can discuss alternatives and help them redirect their goal. Another group may have planned to tackle too many questions. Again, the teacher can help them formulate a more realistic plan.

Through discussion, group members exchange views about the scope of their inquiry. They clarify exactly what it is they want to investigate. One group member will serve as recorder and write down everyone's questions. The first time a class undertakes Group Investigation the procedure at this stage may be somewhat schematic. If there are four students in the group, there may be eight questions, which the students then divide among themselves. As the class becomes more comfortable with the process, it is not unusual for the group to start off with one idea and end up with quite another. Many teachers find it useful to have groups fill out a worksheet that structures the steps of this planning stage. Figure 1 is an example of such a worksheet.

Generally, groups find it helpful to have one member serve as recorder to organize their work. The recorder reminds group members what their roles are and what the deadline is for

Fig. 1. Sample Worksheet

Our Research Topic:

How did the different Indian tribes adapt their dwellings to their environment?

Group Members:

Bob, Spencer, Billie Jean, Shel, and Nancy

Roles:

Bob—coordinator; Billie Jean and Nancy—resource persons; Spencer—steering committee; Shel—recorder

What do we want to find out?

Bob and Nancy—How did the nomadic Apaches design their shelters?
Spencer and Billie Jean—In what way did hogans suit the Navajo way of life?
Shel—What kind of dwellings did the ancient Indians design?

What are our resources?

Under this heading the recorder will list the books to be read, the people to be interviewed, and the sites to be visited. Perhaps all five members of this subgroup will visit the same site and interview the same people, but each one will prepare specific questions and may turn to different reference material.

How Effective Is Group Investigation?

Over the past 12 years, we have evaluated the effectiveness of Group Investigation in a series of 10 large-scale experiments. These studies encompassed many classrooms and hundreds of pupils and were conducted at different grade levels with different subject matter. Most of these studies required several years for training, implementation, and evaluation to be completed. By this thoroughness, we hoped to avoid the artificial character of many short-term classroom experiments whose results have limited applicability to real classroom situations. Here we highlight the main features of these studies and refer the reader to the relevant publications.

All of the research we carried out had to begin from scratch. Our aim was to implement cooperative learning in general, and Group Investigation in particular, as well as study various effects of the implementation. We first had to train the participating teachers in the principles and procedures of cooperative learning, because they were accustomed almost exclusively to whole-class instruction. In each study, we took steps to help teachers cope with their doubts and fear of failure, as well as with their need to change basic attitudes and skills. For instance, we set up small teams of teachers to provide mutual assistance in planning lessons in detail, observing each other's lessons, and giving each other objective feedback on what happened during the lesson. These "self-help" units proved invaluable for the teachers.

Academic achievement. Five of the studies assessed pupils' achievement. At both the elementary and secondary levels, students from the Group Investigation classes generally demonstrated a higher level of academic achievement than did their peers taught with the whole-class method. Moreover, students who experienced Group Investigation did better on questions assessing high-level learning, although on occasion they did only just as well as students from the traditional method on questions evaluating the acquisition of information (Lazarowitz and Karsenty 1989, Sharan et al. 1984a, Sharan et al. 1980, Sharan and Shachar 1988, Sharan and Shaulov 1989). Of particular interest are the findings from a study that analyzed pupils' spoken language (Sharan and Shachar 1988). Three groups of pupils (with six pupils per group) from each of nine 8th grade classes were formed at random and asked to conduct two discussions of 15 minutes each, one on a topic from their study of geography, the other on a topic from their history classes. The discussions were videotaped and analyzed by judges.

When they studied in Group Investigation classes, pupils from both ethnic groups in Israel (those whose families are from Western countries and those from Middle Eastern countries) used more words per turn of speech than did their ethnic peers taught with the whole-class method. Moreover, the lower-class Middle Eastern children (often considered to have limited language) who had studied in Group Investigation classes used as many words per turn during the discussions as did the middle-class Western students in the groups taught with the whole-class method. Pupils from both ethnic groups who had studied in Group Investigation classes participated with equal frequency in the discussions, but in those groups from classes taught with the whole-class method, the Western middle-class students dominated the discussions.

Social interaction. Data gathered on pupils' social interaction leave no doubt that whole-class teaching stimulates a great deal of competition among students while Group Investigation promotes cooperation and mutual assistance among them. Group Investigation even promotes positive social interaction among classmates from different ethnic groups (Hertz-Lazarowitz et al. 1980, Sharan in press, Sharan et al. 1984b, Sharan and Rich 1984, Sharan and Shachar 1988).

Group Investigation and teachers. One of our studies reported an in-depth analysis of teachers' reactions to an instructional change program to implement cooperative learning in three elementary schools (Sharan and Hertz-Lazarowitz 1982). Teachers expressed more positive attitudes toward their work following participation in the project: they perceived their schools as having a more positive climate, and they expressed less need to control their students' behavior all the time.

Another study examined the effects of Group Investigation on teachers' language when interacting with their students (Hertz-Lazarowitz and Shachar 1989). Twenty-seven teachers of 1st through 6th grade were tape-recorded several times during the first half of the year when they employed the whole-class method exclusively and several times during the second half of the year when they taught with the Group Investigation method. The researchers found that, during use of the whole-class method, the teachers tended to deliver long lectures, give students orders, ask questions that required short answers, use collective disciplinary measures, and praise the entire class as a unit in general terms. All in all, their speech was quite formal, even rigid, in nature. By contrast, when these same teachers used Group Investigation, their speech was more intimate; they expressed support for student initiative, encouraged communication among the students, gave students feedback about their academic work, and praised individuals for specific activities.

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reporting back to the group. The recorder may also keep a record of everyone's progress. A coordinator (or chair) serves as leader during group discussions when everyone shares information and makes plans. The coordinator also encourages everyone to contribute to the group's effort.

A copy of each group's worksheet should be posted. In addition to serving as a reminder of what each group is doing, this display shows how the whole class works as 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 topic.

Stage 3. Carrying out the investigation. In this stage, each group carries out the plans decided on in Stage 2. Group members gather information from a variety of sources, analyze and evaluate the data, reach conclusions, and apply their share of new knowledge to "solving" the group's research problem. Each class period at this stage begins with the teacher's reviewing with each group what it plans to do that day. One or two group members may spend some time in the library, others may summarize their visit to a museum, while a few may interview a resource person inside the school. Or they may all view a filmstrip or read a relevant article. Group members discuss their work and help one another.

Groups may choose to have the recorder note their tentative conclusions, or each member may present a written summary of his or her findings. Groups carrying out their first investigations, especially in the lower grades, may simply have each member present a short summary or answer to the question that he or she investigated. With experience, this intergroup summary becomes a problem-solving discussion: the students continue to share information but go on to compare their respective findings and search for ways to apply them to their research problem. At this point experienced students will often "discover" a new problem that evolves from their discussion of their findings.

Stage 4. Preparing a final report. This stage serves as a transition from data gathering and clarification to the

presentation of the most significant results of the inquiry. It is primarily an organizational stage, yet it entails such intellectual activities as abstracting the main idea of the group's project, pulling together all the parts into an integrated whole, and planning a presentation that will be both instructive and appealing. Presentations can take the form of an exhibit, a model, a learning center, a written report, a dramatic presentation, a guided tour, or a slide presentation, to mention only a few options.

Some groups decide what their final report will be when they begin their work. Other groups plan their report in Stage 4. For still others, the report begins to take shape while they're involved in their investigation. A group studying the dwellings of Indian tribes, for example, constructed an Indian village as part of their inquiry and then presented it to the class. Students in a group inquiring into the life of an author waited until all their data were collected in order to prepare a short skit on the most important period of her life.

During the planning that groups conduct at this stage, students assume a new role—that of teacher. True, all along group members have been telling each other about their work and continually discussing what they did or did not understand; they have been tutoring each other every step of the way. But now they begin to plan how to teach their classmates, in an organized way, the essence of what they've learned.

When the teacher notes that the groups are nearing the end of their investigations, it is time to convene the members of the steering committee (who were chosen in Stage 2). The committee hears each group's plan for its report. The teacher writes down each group's requests for special materials and coordinates the schedule. With the teacher's guidance, the committee members make sure that the ideas for presentation are varied and clear and can indeed be carried out. The teacher continues in the role of advisor, helping the committee where

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needed, and reminding them that each group's plan should involve all its members.

Stage 5. Presenting the final report. The groups are now prepared to present their final reports to the class. At this stage, all the groups meet and reconstitute the whole class as a social unit. The schedule of presentations is posted, and each group knows how much time it has for its presentation. After each group's turn, the members of the "audience" voice their reactions to what they saw and heard.

Stage 6. Evaluation. Group Investigation exposes students to constant evaluation, by both peers and teacher. The discussions among group members at every stage of their work, as well as the meetings with the teacher, make students' grasp of their topic and of their work visible at all times. During the entire course of the inquiry, the teacher has many opportunities to form reliable judgments on the basis of frequent conversations and observations of the students' academic and social activity (Sharan and Hertz-Lazarrowitz 1980).

In assessing learning in Group Investigation, the teacher evaluates students' higher-level thinking about the topic they studied. Evaluation focuses

on the application of knowledge to new problems, the use of inferences, and the drawing of conclusions. In addition, the teacher evaluates the investigation process itself.

Alternatively, teachers and students can collaborate in order to evaluate learning. Each group can submit questions about the most important aspects of their subtopic. In a class of seven groups, for example, each group might suggest two questions. The final exam then consists of 14 questions. Each student answers 12 questions, excluding the two contributed by his or her group. After the exam, the teacher may ask each group to correct everyone's answers to the two questions it submitted. In this way the group serves as a committee of experts who evaluate their classmates' learning.

Students' affective experiences during their investigation are also part of the evaluation. Students should reflect on how they feel about the topic they investigated as well as about how they carried out their investigation. The teacher might ask the students to write a short summary of what they felt they learned about the topic and about how to increase their effectiveness as investigators. Or the teacher could conduct discussions in small groups to allow students to express their feelings about the content they learned and the process of learning.

Studying What Interests One Most

Why is Group Investigation so effective? First and foremost, it gives students more control over their learning than other teaching methods—even other cooperative learning methods—do. Students inquire into those aspects of a subject that interest *them* most. They raise questions that reflect their different interests, backgrounds, values, and abilities. These differences are the group's greatest asset: they ensure a wide range of knowledge and skills. The Group Investigation method provides an excellent structure for harnessing both these skills

and students' individual interests for fruitful academic inquiry. □

Authors' note: This article is based on a chapter from our forthcoming book of similar title.

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