Inquiry learning

Inquiry learning stands the usual advice about expository (lecture-style) teaching on its head: instead of presenting well-organized knowledge to students, the teacher (or sometimes fellow students) pose thoughtful questions intended to stimulate discussion and investigation by students. The approach has been described, used, and discussed by educators literally for decades, though sometimes under other names, including inquiry method (Postman & Weingartner, 1969), discovery learning (Bruner, 1960/2006), or progressive education (Dewey, 1933; Martin, 2003). For convenience, we will stay with the term inquiry learning.

The questions that begin a cycle of inquiry learning may be posed either by the teacher or by students themselves. Their content depends not only on the general subject area being studied, but also on the interests which students themselves have expressed. In elementary-level science, for example, a question might be "Why do leaves fall off trees when winter comes?" In high school social studies classes, it might be "Why do nations get into conflict?" The teacher avoids answering such questions directly, even if asked to do so. Instead she encourages students to investigate the questions themselves, for example by elaborating on students' ideas and by asking further questions based on students' initial comments. Since students' comments can not be predicted precisely, the approach is by nature flexible. The initial questioning helps students to create and clarify questions which they consider worthy of further investigation. Discussing questions about leaves falling off trees, for example, can prompt students to observe trees in the autumn or to locate books and references that discuss or explain the biology of trees and leaves.

But inquiry is not limited to particular grade levels or topics. If initial questions in a high school social studies class have been about why nations get into conflict, for example, the resulting discussions can lead to investigating the history of past wars and the history of peace-keeping efforts around the world. Whether the topic is high school social studies or
elementary school biology, the specific direction of investigations is influenced heavily by students, but with assistance from the teacher to insure that the students' initiatives are productive. When all goes well, the inquiry and resulting investigations benefit students in two ways. The first is that students (perhaps obviously) learn new knowledge from their investigations. The second is that students practice a constructive, motivating way of learning, one applicable to a variety of problems and tasks, both in school and out.

### Cooperative learning

Even though inquiry-oriented discussion and investigation benefits when it involves the teacher, it can also be useful for students to work together somewhat independently, relying on a teacher's guidance only indirectly. Working with peers is a major feature of **cooperative learning** (sometimes also called **collaborative learning**). In this approach, students work on a task in groups and often are rewarded either partially or completely for the success of the group as a whole. Aspects of cooperative learning have been part of education for a long time; some form of cooperation has always been necessary to participate on school sports teams, for example, or to produce a student-run school newspaper. What is a bit newer is using cooperative or collaborative activities systematically to facilitate the learning of a range of educational goals central to the academic curriculum (Prince, 2004).

Even though teachers usually value cooperation in students, circumstances at school can sometimes reduce students' incentives to show it. The traditional practice of assessing students individually, for example, can set the stage for competition over grades, and cultural and other forms of diversity can sometimes inhibit individuals from helping each other spontaneously. Strategies exist, however, for reducing such barriers so that students truly benefit from each other's presence, and are more likely to feel like sharing their skills and knowledge. Here, for example, are several key features that make cooperative learning work well (Johnson & Johnson, 1998; Smith, et al., 2005):

- **Students need time and a place to talk and work together.** This may sound obvious, but it can be overlooked if time in class becomes crowded with other tasks and activities, or with interruptions related to school (like assemblies) but not to the classroom. It is never enough simply to tell students to work together, only to leave them wondering how or when they are to do so.

- **Students need skills at working together.** As an adult, you may feel relatively able to work with a variety of partners on a group task. The same assumption cannot be made, however, about younger individuals, whether teenagers or children. Some students may get along with a variety of partners, but others may not. Many will benefit from advice and coaching about how to focus on the tasks at hand, rather than on the personalities of their partners.

- **Assessment of activities should hold both the group and the individuals accountable for success.** If a final mark for a project goes only to the group as a whole, then freeloding is possible: some members may not do their share of the work and may be rewarded more than they deserve. Others may be rewarded less than they deserve. If, on the other hand, a final grade for a group project goes only to each member's individual contribution to a group project, then overspecialization can occur: individuals have no real incentive to work together, and cooperative may deteriorate into a set of smaller individual projects (Slavin, 1994).

- **Students need to believe in the value and necessity of cooperation.** Collaboration will not occur if students privately assume that their partners have little to contribute to their personal success. Social prejudices from the wider society—like racial bias or gender sexism, for example—can creep into the operations of cooperative groups, causing some
members to be ignored unfairly while others are overvalued. Teachers can help reduce these problems in two ways: first by pointing out and explaining that a diversity of talents is necessary for success on a group project, and second by pointing out to the group how undervalued individuals are contributing to the overall project (Cohen, Brody, & Sapon-Shevin, 2004).

As these comments imply, cooperative learning does not happen automatically, and requires monitoring and support by the teacher. Some activities may not lend themselves to cooperative work, particularly if every member of the group is doing essentially the same task. Giving everyone in a group the same set of arithmetic problems to work on collaboratively, for example, is a formula for cooperative failure: either the most skilled students do the work for others (freeloading) or else members simply divide up the problems among themselves in order to reduce their overall work (overspecialization). A better choice for a cooperative task is one that clearly requires a diversity of skills, what some educators call a rich group work task (Cohen, Brody, & Sapon-Shevin, 2004). Preparing a presentation about medieval castles, for example, might require (a) writing skill to create a report, (b) dramatic skill to put on a skit and (c) artistic talent to create a poster. Although a few students may have all of these skills, more are likely to have only one, and they are therefore likely to need and want their fellow group members' participation.