

Creating Cooperative Learning Environments

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Cooperative learning is:

a waste of time.

a great way to avoid the hard work of lecturing.

an ideal paradigm for lovers of social loafing.

another left-wing harebrained idea advocated by aging hippies.

some or all of the above.

If you responded like many psychology professors, you agree that there is too much material to cover in your classes to waste time on cooperative learning, and you might want to add that students paid to learn from a real professor, not another (equally ignorant) student. Lecturing “works,” so “if it ain’t broke, don’t fix it.”

In fact, lecturing does work well for some educational goals. Lecturing is a *high baud rate* mode of instruction, which means that a large amount of information is transferred in a relatively short period of time.

If the instructor’s goal is to convey basic information so that students can repeat or paraphrase material that the instructor spoke in class (and wrote on the chalkboard) lecturing may be a good approach.

Why You Should Consider Using Cooperative Learning (CL)

Many (maybe most) faculty believe lecturing is synonymous with teaching. After all, this is the way many of us were taught and the idea that teaching is lecturing is often supported by the culture of our departments, but the empiricists among us will be happy to learn that there is a solid body of research showing that a judicious mix of pedagogies can help students achieve a variety of educational goals.

Although lecturing appears to foster effective learning when it is assessed soon after the lecture, it is not an effective way to achieve other learning goals, such as the ability to apply knowledge in real world settings or recall information in a novel context. In other words, information learned via lectures does not transfer well – the *real* goal of learning. Lecturing is also a poor method for fostering long term retention.

Cooperative learning offers an alternative or supplement to the one-way communication that typifies

lectures and may be used occasionally or more frequently depending upon the nature of the class and the instructor's goals (see the Teaching Tips which follow).

CL is an umbrella term for a variety of educational approaches that involve joint intellectual efforts by students or students and instructors together. In CL, students are actively involved with the information being learned and interactively involved with other learners. Students work together on tasks that require them to explore, apply, question, and generate information. With CL, much of the responsibility for *making learning happen* shifts from the instructor to the student, where it rightfully belongs. The large literature on cooperative learning clearly shows that it is highly effective in achieving long-term learning objectives. In a meta-analytic review of 226 studies that compared cooperative and individualistic learning settings, cooperative learning produced greater *individual* achievement than competitive approaches (effect size = .49) or individualistic approaches (effect size = .53, Johnson, Johnson, & Smith, 1998). There is ample evidence that it works in achieving many important learning goals.

Critical Features for Successful Cooperative Learning

I recall with painful clarity my early and not-too-successful attempts to use CL. I learned the hard way that CL is more than putting students into groups and telling them to work together (much like the character on *Saturday Night Live* who tells viewers to "talk amongst yourselves" while she busies herself with other things). CL activities need to be carefully planned, highly organized, and well-structured, with clearly defined subtasks that are relevant to the educational objectives. In order to be successful, cooperative learning activities must incorporate at least six critical features. (There may be others.)

To be most successful CL assignments should include the following characteristics.

Positive Interdependence

Each student depends on the other group members to successfully complete the task. This feature fosters the power of positive peer interactions-students are motivated to achieve at a high level because their classmates are depending on them. An example of positive interdependence can be found in *jigsaw* tasks, a scheme for specifying groups that gets its name from the popular puzzles that require different-shaped pieces to fit together to create the whole. With jigsaws, students are assigned to small groups, with each group specializing in one aspect of a problem or issue.

For example, in a class on theories of personality, different groups would be formed for each major theorist. Group members work cooperatively to gather information on their topic and then share what they have learned about their assigned theorist with each other. The extent to which students are provided with guiding questions and the teacher's specific instructions for each student depend on the level of the class, student ability, and the goal of the activity.

The groups then reform with one member from each of the original groups in every new group (e.g., one person who learned about Freud's views on personality, one person who learned about Skinner's views, etc.). Students in the newly formed groups now teach the others about the theorist they studied. Groups continue to mix with one *expert* on each theorist in each group.

Everyone's learning depends on the effort and success of every other student because students are responsible for teaching and assessing each other. As the groups change members, everyone becomes more knowledgeable about all of the theorists. This activity can be concluded by having students make comparisons among the theorists and by asking them to respond to particular case studies using several theoretical frameworks.

Individual Accountability

Every student's learning is assessed individually. There is disagreement in the literature about the desirability of individual accountability, but I believe that it alleviates a major problem commonly found in group work-inequitable distribution of the work load. Generalizing from my personal experience, every classroom has at least one student who thinks *loafer* is not just a type of shoe. Consider the jigsaw example just described. Individual accountability can easily be incorporated by grading each student's paper separately or by giving individual exams of any type.

Some professors like to take a middle-ground on this issue and mix individual grades with "bonuses" or other grading plans that depend on the performance of all group members.

For example, instructors who want to assess gains in students' knowledge or skills might give a pretest at the start of the semester. For long term assignments where groups remain intact for most of the semester, it would be easy to provide a bonus (e.g., an additional 10 percent of total possible points) to everyone in those groups where every student shows a pretest-posttest gain of at least 20 percent.

In this way, students are motivated to assist each other in showing educational gains, but the major portion of their grade depends on their own work products.

When CL activities incorporate frequent self assessment and informal assessments by other group members, students become better at making judgments about what and how much they know. Practice tests and problem solving groups provide practice with self assessments, especially when they are reviewed and discussed as part of a CL activity.

Appropriate Assignment to Groups

Heterogeneous groups allow stronger students to model their thinking and learning processes for weaker students. Instructors can create heterogeneous groups by frequently using group work and assigning students to groups in ways that ensure many different mixings of group members. Statistics classes present a good opportunity to follow standard lecture-type instruction with group problem solving. Positive interdependence can be fostered by stipulating that the group assignment is not complete until everyone in the group can solve the problems.

As students teach and learn from each other, the students who are modeling the thinking process must actively reflect on the strategies they are using to solve problems. In this way, the usually tacit process of solving problems is made explicit. The use of heterogeneous ability groups is consistent with Bandura's classic studies of self-efficacy, in which he found that modeling by someone who is similar to you can shape beliefs about your own ability and can increase motivation to achieve a goal.

Teacher as Coach or Facilitator

The instructor's role changes when she moves from in front of the podium to walk around the room and work with students on their CL activities. With CL, the teacher is a valuable member of a learning community who assists students in becoming more independent learners. Student-teacher interactions increase because instructors need to monitor the progress of small groups to determine that they are on track.

I find that the enhanced personal involvement with students is one of the most important benefits of CL. As students become better at assessing their own learning, the instructor becomes more like a learning coach and less like a judge and (sometimes) executioner whose sole purpose is to grade students.

Attention to Social Skills

Expectations about behavior in learning groups are made explicit and often are graded. I have used signed contracts as a way of emphasizing my belief that the ability to work well in groups is an important educational outcome in psychology classes.

Every class member must agree to allow others to state their views without interruptions; disagreements must center on the content of the statement, not the speaker; and conclusions need to be examined for sound reasoning and evidence.

Social and cognitive skills operate jointly in the real world that exists outside the classroom; they need to be practiced together in the classroom. Many psychology classes are minefields for social and political controversies. Why are there group differences on intelligence tests? Is homosexuality normal? How could criminal behavior be inherited? Students must grapple with alternative points of view. CL activities make the thinking and learning process more visible and shared, often forcing students to see alternative ways of constructing meaning and interpreting information. The collision of world views, especially among heterogeneous group members, can reduce the powerful effects of confirmation bias and offers the hope of reducing prejudices.

Interactive Problem-Solving and Discussion

CL activities are responsive to group members. Learners do not act in parallel or respond sequentially to each other. The dynamic interaction among group members is critical, so that the action of one student provides direction for the response of another. The changing nature of technology has created changes in how students learn and challenge our older notions of face-to-face interaction.

CL groups are forming on web sites and via other media so that people in distant places can function as a cooperative group, without occupying the same room or even working at the same time. Web-based learning sites now allow CL groups with members from different countries contributing solutions to problems or adding information to a data pool.

Cognitive Principles Applied in Cooperative Learning

Cooperative learning is not a unitary technique; there are endless varieties and possibilities for

cooperative learning activities. They all *work* because they utilize basic principles in learning and thinking. These are the same principles that we teach about in many psychology classes (e.g., cognitive psychology, learning, motivation, intellectual development, group processes, and developmental psychology) then ignore when we teach about them.

- **Increased time on task** – This is a basic principle in learning: the more time and effort students put into learning, the greater the probability that quality learning will occur. In general, students spend more time working actively with cooperative learning groups.
- **Increased motivation** – In general, students are more motivated to succeed. Students depend on each other to complete an assignment, a fact that usually increases motivation to achieve at a high level.
- **More immediate feedback** – Students receive more feedback on their learning and thinking and they receive it with more immediacy than in traditional learning settings.
- **Thinking and learning are modeled as processes** – The process of how to think about a complex issue and how to learn is modeled and practiced. Thinking and learning become dynamic processes instead of learning outcomes.
- **Shared knowledge and skills** – When tasks are complex, the knowledge, skills, and experiences of group members can be shared so that the collective knowledge of the group can achieve goals that would elude any single member.
- **Connected knowledge structures** – Information is processed more deeply when students are required to process it in a meaningful way. Cognitive psychologists conceptualize meaning as constructed within a web of related concepts. A concept or idea becomes meaningful when it is connected to many other concepts in memory. When students are required to elaborate information that is being learned, the result is improved comprehension and a greater likelihood that it will be recalled successfully with appropriate retrieval cues.

Teaching Tips: A Sampler of Cooperative Learning Activities

Once faculty become comfortable with using cooperative learning, almost any learning activity can involve CL. You can start with short activities that adhere to a subset of the six critical features listed above. As you become more comfortable with CL, you'll wonder why you didn't try it sooner. Here is a brief list to get novices started and to encourage you to give CL a try.

- A good CL activity with which to begin is a simple but effective activity that can easily be incorporated into any large lecture class. Stop in the middle of class and have students summarize the topic to another student who checks on their comprehension. Then have the student who was the comprehension checker present a brief summary to a third student. This is something every instructor can do in his or her next class session in 8 – 10 minutes. Students can feel the difference in learning when they generate a summary. Active retrieval of information from memory is an excellent learning activity. There is no need to grade short activities like this.
- Present a brief problem to solve. This approach is a natural in statistics classes where lecture-type instruction can be followed by small group problem solving. Correct solutions can be put on the board by the entire group which then explains the problem solving process and solution to the rest of the class. Be sure that students are providing clear and complete explanations so that they practice oral presentation skills along with shared problem solving.
- Use jigsaw groups in a library assignment in which students need to find information about a

complex topic. Consider, for example, the question of how to treat alcoholism. Groups of students can be assigned different treatment methods and asked to find information about each—abstinence programs, family interventions, drug treatment programs, behavior therapies, etc. Given the complex nature of alcoholism, most undergraduate students will need careful guidelines on how to find appropriate information, what makes information credible, what the underlying assumptions are for each approach, and how to read original research. Each group could be asked to suggest one or two readings on their topic that everyone in the class should read. After gathering and summarizing information within each topical group, new groups are formed consisting of one member from each original group. Information is synthesized in these “mixed” groups and then with the entire class. The instructor needs to carefully monitor and guide the activity and bring it together with questions and summaries contributed, in part, by the students.

- Post and respond to questions via listserves, bulletin boards, e-mail, web sites. We need to take advantage of the new multimedia possibilities for CL. Group learning activities can be found on many psychology-related learning sites and instructors can create their own on the Internet. Instructors can pose a question every week on a class listserve and require that every student respond to some number of them. Listserves require their own set of social skills that need to be developed and practiced. Students can be required to respond to postings from other students as well as the one from the instructor. This sort of CL seems best suited for pass/fail grading, but almost any grading scheme could work depending on the nature of the question and the time and effort requirements.
- Use strategies that generate creative responses such as brainstorming, stating a problem in multiple ways, and listing pros and cons. Many psychology instructors want to enhance their students’ abilities to think critically. One way to do this is to teach them how to recognize and approach problems. For example, instead of asking for a solution to a problem, present a scenario and ask small groups of students to state the problem in several different ways. Compare their responses with that of other groups who are asked to brainstorm (provide an uncensored list of ideal solutions) and others who are asked to list interesting aspects of the problem. Compare the types of responses that were produced with these different approaches to problem solving. Finally, provide another complex scenario and ask them how they went about devising a solution.
- Another CL activity that focuses on the thinking process is to present an applied problem and have students list three questions they would like to be able to ask about the problem to guide their thinking. Have students form into small groups to discuss the questions they listed and then, as a group, rank order all of the questions in terms of their importance and explain the reasons for their rankings. This sort of attention to the process of thinking critically can reveal unstated assumptions and biases in the thinking process.
- For any of psychology’s many controversies, assign different perspectives on the controversy to different groups of students. For example, students in a course in organizational development could take different roles on how to handle the problem of declining profits in a large company (e.g., chief executive officer, union leader, employee who is near retirement, local politician, consumer).
- Teach students how to draw concept maps in which information that is conceptually related is drawn close to and linked with other similar topics. Groups can then draw maps of their knowledge of a content area before learning about it, (for example, a group map of what students know about mental illness at the start of a course on abnormal psychology). At the end of the

course, put students back into their original groups and have them redraw their concept map and then compare the two. How has the information been reorganized? What was added and deleted? How has the nature of their understanding changed over the course? This activity works well as a group contribution to individual grades where outstanding concept maps at the end of the course can be worth additional points toward each group member's grade.

Conclusion

Why should we use cooperative learning? The answer is clear: CL activities result in better learning and retention, enhanced accuracy and creative problem solving, and better critical thinking for learners. But there are also advantages for lecture-weary instructors-class is more interesting and more fun for us as well.