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Active learning and cooperative learning: understanding the difference and using both styles effectively

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Abstract

Active learning is any teaching method that gets students actively involved; cooperative learning is one variety of active learning which structures students into groups with defined roles for each student and a task for the group to accomplish. Lecture-based library instruction is often unsuccessful for many reasons, including poor student attention, simplified examples, and too much material presented at one time. Active and/or cooperative teaching techniques involve the students in the class and increase retention of information following the class period. Active learning techniques are easier to apply and take less class time, while cooperative learning techniques require more advance planning and may take an entire class period. Choosing a teaching technique must be done carefully, with an understanding of the goals of the class session. Several possible goals are detailed, along with suggested techniques for meeting each one.

Keywords: Active learning; Cooperative learning; Teaching method

1. An introduction to active and cooperative learning

Of the many changes in library instruction in recent years, a welcome development has been an increase in the use of active learning and of cooperative learning techniques in instruction sessions. These styles of library instruction are well represented in the literature and in conference presentations. Both teaching styles can be effective in helping a class to learn and understand the concepts of library use. Like all teaching styles, they must be properly applied to the level of class and the material being taught. However, many librarians do not have a clear understanding of the differences between and the proper application of active and cooperative learning.

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Active or experiential learning, in one form or another, has been studied for centuries (Ragains, 1995). In their book *Active Learning: Creating Excitement in the Classroom*, Bonwell and Eison (1991) provide the following definition: "Though the term 'active learning' has never been precisely defined in educational literature, some general characteristics are commonly associated with the use of strategies promoting active learning in the classroom:

- Students are involved in more than listening.
- Less emphasis is placed on transmitting information and more on developing students' skills.
- Students are engaged in activities (e.g., reading, discussing, and writing).
- Greater emphasis is placed on students' exploration of their own attitudes and values" (Ragains, 1995).

As a working definition, Bonwell and Eison (1991) suggest that "active learning be defined as anything that 'involves students in doing things and thinking about what they are doing.'" Many techniques can be used to get the students involved, including "experiential learning, cooperative learning, problem-solving exercises, writing tasks, speaking activities, class discussion, case-study methods, simulations, role-playing, peer teaching, fieldwork, independent study, library assignments, computer-aided instruction, and homework (Houston, 1995)." The method of active learning chosen will depend upon the situation, i.e., upon what is being taught to what level of student.

Cooperative learning is one approach to active learning. Cooperative learning is always active learning, but not all active learning is cooperative. According to Johnson et al., cooperative learning is the "instructional use of small groups so that students work together to maximize their own and each other's learning." In order to work well, cooperative learning *needs to be planned*, with consideration given to the appropriate size of the group, to each student's role within the group, and to how the results will be evaluated and used in the class session. Every student in a cooperative learning group should have a role or part to play in order to accomplish the task. It is not just any "group work." Like active learning, the particular group exercise must be chosen for the academic task and the students who must accomplish it (See Table 1).

Many exercises can work both individually or in groups. The librarian applying these techniques should not worry as much about whether to use active or cooperative techniques as about whether the exercise chosen fits their identified goals.

2. Active learning vs. the lecture mode

Many researches recently published have established the applicability of active learning and of cooperative learning to library instruction. There are many problems with traditional lecture-based instruction. In their summary of research on the use of lectures, Johnson et al. (1991) point out that

- Students' attention to what the instructor is saying decreases as the lecture proceeds;
- Lectures presume the listener is oriented towards auditory learning;

Table 1
Active vs. cooperative learning techniques

Active learning techniques	Cooperative learning techniques
Get students involved in the topic, and are more interesting for the students than lectures	Get students involved in the topic, and are more interesting for the students than lectures
Easier to start with (for instructors accustomed to lectures)	Require more advance planning
Good for modifying a lecture	Good for breaking out of the lecture mode
Usually take less time	Often take much of the class time
May be able to fit several exercises into a class period	May only do one or two exercises in a class period
Flexible—one technique can be applied repeatedly to teach several skills	Exercises must be tailored specifically to the task at hand but are usually very successful
Students are more likely to accept individual exercises (at first)	Results from cooperative learning are worth the effort

- Lectures tend to promote only lower-level learning of factual information;
- Students tend not to like lectures.

In articles on the topic of active learning, Williams and Cox (1992) and Ragains (1995) report that feedback from students after traditional lecture-based library instruction sessions was generally negative. Johnson et al. (1991, Section 5: 9) also point out that "entertaining and clear lectures misrepresented the complexity of the material being presented." Certainly many instruction librarians, feeling the time pressure of a 50-min, one-shot session, have used prepared searches to demonstrate a database, inadvertently leaving students with no idea how common it is for a search to fail and with few clues as to how to handle common search problems in electronic databases.

Gremmels (1996) uses the analogy of a dump truck to describe lecture-based teaching. "So we in effect load our pedagogical dump truck as full as we can, back it up to the classroom, and unload it onto our students, burying them in teaching ... When we use the dump truck method, we overwhelm our students with more skills and strategies than they can possibly absorb in an hour. That's our first mistake. Then we fail to give students the opportunity to practice any of the strategies and skills, virtually guaranteeing that they won't be internalized."

Several writers provide rationales for the use of active or cooperative learning techniques in library instruction. Mabry (1995) reminds us that "one of the primary tenets of cooperative learning is that, if instructors are prepared to give up some control, students will learn more and retain that knowledge longer." Allen (1995) summarizes the work of several researchers to show that active learning leads to increases in student learning and interest and affects the cognitive, sensorimotor, and affective domains. Ridgeway (1989), Sheridan (1990), and Jacobson and Mark (1995) also address many benefits to these styles of teaching, including meeting the needs and learning styles of diverse students, improving student retention of information presented, increasing student interaction with information, and increasing student responsibility for their own learning in the classroom.

3. Selecting a new teaching technique

Choosing a technique to use in library instruction begins with identifying what it is you want the students to learn. *Write a list of goals and clarify your objectives*. Allen (1995) states, "carefully lay out your objectives. Planning and organization is essential to good teaching. We must clearly know what it is we want to teach." Specify exactly what it is you want the students to learn or what it is the professor or instructor wants the student to learn. Then, look to see which of these goals are most important and which are subordinate to the main goals. For example, one main objective for a freshman class may be for the students to learn the locations of many things in the library. Related goals are having a general idea of what is in the library, knowing that Library of Congress call numbers are a guide to where specific materials are kept, and knowing where to ask for help. All of these goals can be summed up in the main goal of knowing one's way around the library.

It is important to be realistic in the goals you choose. Librarians and the teachers they work with are often too ambitious about how much can be taught in a particular session. Remember that it is not realistic to expect that students will remember everything covered in any training session, especially in a lecture (Johnson et al., 1991). Even if you "cover" a topic in a lecture, students may not learn it. It may seem that, compared to a lecture, you are *covering* less material when you use active learning techniques, but when you consider how much is actually learned and retained, you are actually *teaching* more.

As you plan your class session, look over your list of goals several times and ask yourself if it is realistic. Then, ask what style of teaching and type of activity will best fit your goals. Allen (1995, p. 99) reminds us, "One caution cannot be overstated: incorporating active learning techniques must be purposeful to carry out specific and important objectives, and must require students to use the higher order skills of analysis, synthesis, and evaluation. Anything less and students will consider your classes to be busy-work—gimmicky and worthless."

Using active or cooperative learning techniques does not mean you must leave out lectures entirely. Short lectures—5 to 10 min—are still used to introduce the basic steps of a new skill. Those short lectures are then followed by active or cooperative exercises. King (1993) provides this guideline, "A general rule of thumb might be as follows: for each major concept or principle that we present, or that our students read about in their text, we structure some activity that requires students to generate some meaning about that concept or principle." Most learning will take place during the exercises, but active and cooperative learning techniques could not substitute for the explanatory lecture entirely.

Whether you are new to the techniques of active or cooperative learning or somewhat experienced, allow yourself a reasonable amount of time to plan for classes that apply active or cooperative learning. Remember that changing your teaching style will feel awkward at first. Ridgeway (1989, pp. 35–36) suggests the following techniques for dealing with the change to active learning.

- Read and re-read articles or books on the subject, make charts, brainstorm with colleagues or by yourself; reflect on what is practical for your library in a given semester.
- If you are not comfortable with a certain technique, try a different one.
- Visit the classrooms of teachers or professors who use cooperative learning.

- If there is an opportunity, attend a conference program or a longer seminar, whether for librarians or for other teachers, about using these styles of teaching.
- Remember that any form of change is challenging and that some colleagues or professors may not be supportive.

4. Using active learning

When would you choose active learning techniques? Active learning is excellent for modifying or adjusting the standard classroom lecture. Many active learning techniques are more flexible and less time-consuming than cooperative learning. They are, therefore, easier to adapt into an existing program.

If you are new to active and cooperative learning, it is easier to begin with active learning. Also, if you are the library instruction librarian and have several co-workers who are also teaching classes under your guidance, it will be easier to introduce shorter active learning techniques to your co-workers and to use them until everyone is comfortable with them. Since many of these techniques can be done by students working individually or in groups, they can become a stepping stone to the full-fledged cooperative learning workshop. The change to cooperative learning may require a complete re-working of your library instruction workshops; active learning can be used as a smaller modification. Nevertheless, active learning techniques should not be seen only as "training wheels" for more complex techniques. If they fit your goals and teaching style, as well as those of the librarians and teachers you work with, then incorporate them into your program and consider them permanent.

Goal: To start students thinking about the library and to introduce the concept of active learning with an exercise that is relatively easy.

Technique: Icebreakers and openers. Ask individuals or groups to come up with five questions about the library or to describe an assignment they have had that used the library, either in high school or in college. Warnken and Young (1991) point out that using an opener such as this "introduces the relevance of subject matter to be covered and at the same time gets students actively involved in the learning process. An opener sets expectations for the class session." It is an easy way to communicate that you will not be solely lecturing and that it will be a participatory class.

Goal: To reinforce certain concepts and to gauge student understanding.

Technique: Short tests and quizzes (Bonwell & Eison, 1991, p. 11; Allen, 1995, p. 97). A common method for modifying a lecture-based class is to use short quizzes. Quizzes require the students to write, and writing out a new concept can help the student remember it. The librarian can use the quiz responses to gauge how well the students understand the concept. Also, these tests do not have to be graded or returned to the students.

Goal: To help students remember what was covered.

Technique: Writing in class (Bonwell & Eison, 1991, p. 35; Meyers & Jones, 1993). Rather than using a quiz, students may be asked to complete other types of writing assignments. They may write out the most important idea from the lecture, to write the one question still uppermost in their minds, or to paraphrase the steps needed to accomplish one task covered in that class session. As with quizzes, writing can help the students remember class topics and can be used to gauge student understanding.

Goal: To encourage student participation.

Technique: Handling student participation positively (Bonwell & Eison, 1991, pp. 22–23). Mabry (1995, p. 184) includes a warning in her description of class discussions in an active learning classroom. "It is important that, in taking student responses, the instructor accepts all answers as valuable, and works diligently to avoid comments that students may perceive as critical or condescending." Mabry does not mean that you must accept inaccurate answers, but that you should always respond openly to student input. When there are questions, responding supportively is the only way to let students know that it is safe to ask. If the concept has already been covered in class that day, do not tell the students that they should already know it! Such a response only teaches them not to ask. Furthermore, handling student questions and input in a friendly manner will encourage students to come to the Reference Desk when they have questions after the class.

Goal: To start students thinking about ways to apply what they are learning (useful when introducing any new tool or search technique).

Technique: Problem-solving (Ridgeway, 1989, p. 42). If you know what topics the students will be researching, use one or more of those topics as examples in your presentation. "Throughout the class ask students to help out their classmates by deciding on the best periodical index to use for some of their topics, what terms they would use to locate material on others, and the appropriateness of certain materials for others, etc." Students could also be given a more structured sort of problem. For example, they may be given three or more resources and asked to determine which is most appropriate for their project. Or, you may set up workstations, each with a different type of library resource on it (encyclopedias, almanacs, indexes, and so on). Students can then be assigned to classify the resources and to describe the categories they decide upon (Gremmels, 1996, p. 86).

Goal: To introduce computerized resources or any new procedure.

Technique: Peer teaching (Bonwell & Eison, 1991, p. 50). Peer teaching is especially useful with the hands-on introduction of a new or a computerized resource. One method is to pair a student who has some experience with a beginning student. Often both students learn from each other. Or, pair any two beginning students together. Often, they will reassure each other while they help each other figure out the steps. I have consistently witnessed that students working in pairs ask fewer, but more complicated questions. Another reason for using pairs is that they encourage student participation. As one article title states: "It's hard to get left out of a pair (Kohn, 1987)."

Goal: To illustrate nearly any library topic.

Technique: Short exercises applying the concept just introduced. For example, pairs of students may be given a sheet with five or six out-of-order call numbers on it and have to put them in order (This usually takes less than 5 min). Or, each student or pair of students may be given a book title or an article citation with the task of finding that item. Students then have to look up the call number, check the location guide, go to the proper location, and return with the item. Some more advanced variations on the same theme could be for a group to find two book reviews on the same book, one scholarly and one popular (Ridgeway, 1989, p. 42). Or, after a lecture defining literary criticism and providing a strategy for locating it, a group of three may use the online catalog to identify literary criticism on three different authors, then retrieve the items from the shelves. Students in this exercise take turns as keyboard operator, recorder, and page (Cook et al., 1995). In nearly any situation in which students must apply a

new concept, the activity leads to many questions from the students — each question creating another opportunity for learning.

5. Using cooperative learning

When should you consider using cooperative learning techniques? Structured cooperative learning techniques are excellent for teaching students many library skills. For starters, cooperative learning is readily applicable to teaching advanced research skills in which there are several steps to follow. Each step can be assigned to one student in a group or, in the jigsaw technique, to one group in a classroom. The collective answer demonstrates the reason for all the steps. Another reason to use cooperative learning techniques is to re-vitalize a library instruction program (or librarian). These techniques take up enough class time that the librarian is forced out of the lecture mode. If you find yourself clinging to the lecture mode even when you know it is not effective, consider giving cooperative learning a fair try.

When cooperative learning groups are doing their activities, the librarian can go from group to group answering questions or providing guidance and reassurance. He or she can be more involved with the learning process than with the lecture mode, and become aware of topics or areas that need more introduction. One article describes the instructor's role as going "from sage on the stage to guide on the side (King, 1993)."

Cooperative learning groups may have between two to five students. Larger groups may have two or three members not participating. It is often useful to provide written outlines for exercises, with a role for each student in the group. For example, one student may be the writer, another does the typing or handles the resource, and another could be the reporter. More details about setting up student roles in the book *Active Learning: Cooperation in the College Classroom* by Johnson et al. (1991).

If the regular instructor of the class has already set up groups, you may want to use them. An instructor who has already used cooperative learning techniques with a particular class may have some valuable advice about group set up and is likely to be more enthusiastic about library instruction if he or she knows you are using cooperative learning.

Goal: To apply a new concept.

Technique: Problem-solving. Groups or pairs can solve all sorts of problems, such as what are the parts of a periodical citation? Warnken and Young (1991, p. 94) say, "Instead of fastidiously explaining how to interpret a citation, break the students into groups and have them figure out the interpretation themselves. This approach requires active involvement, which reinforces learning. The hands-on group experience prepares students for using the indexes on their own." Another problem a group could tackle is to find some good resources for a paper on a certain topic (Ridgeway, 1989, p. 42). Other problems that make good cooperative learning projects include figuring out where (and in what format) a number of periodicals are kept, determining what database is good for researching an assigned topic, and narrowing down a topic.

Goal: To teach electronic searching.

Technique: Search strategies. Groups can develop search strategies for using electronic databases (Drueke, 1992; Dyckman, 1995) or develop Boolean search strategies for a given topic. Furthermore, they can discuss several alternative strategies and learn to recognize the

incorrect use of "and" and "or" (Ridgeway, 1989, p. 41). Dyckman (1995) describes a guided class exercise on Boolean strategy. "First we recommend writing the research topic in the form of a question or statement. We ask that they identify the concepts ("pieces"), and for each concept, list as many synonyms or other distinctive ways to describe it." Students then search each concept separately before bridging them with "and." "We show them how to review their results, specifically to look for other synonyms or relevant terms they might have missed in their initial strategy, and to judge their search results for relevancy."

Goal: To teach many specific resources in a short period of time.

Technique: Jigsaw. "In this technique, students study an issue or a problem in groups, each group working on a specific component of the issue for a set period of time, after which they piece the 'jigsaw puzzle' together via group reports and class discussions (Ragains, 1995, p. 42)." For library instruction, each group can be given a different resource (a reference book, an index or database, a bibliography, and so forth) relating to a research problem the class as a whole must solve. Groups are given an appropriate amount of time to examine their resources, then report to the class ways in which they might be useful. As a whole, the group reports should provide an answer or a search strategy relating to the problem (Johnson et al., 1991, Section 4: 17; Drueke, 1992, p. 80; Ragains, 1995, p. 42).

Goal: To help students understand and evaluate different types of periodical articles or other resources such as databases or reference books.

Technique: Analyzing periodical articles. After an appropriate introduction, groups may be given two or three short articles on the same topic and be asked to figure out which is from an academic journal and which is from a popular magazine. The groups can then make a list of characteristics they believe are typical of the types of articles (Warnken & Young, 1991, p. 94; Cook et al., 1995, p. 20). "Getting the students involved rather than lecturing to them helps them retain more of the information. An active role in the learning process promotes retention and reinforces the information being presented (Warnken & Young, 1991, p. 94)." A more elaborate version of this exercise gives groups of students several varieties of articles —research reports, conference proceedings, editorials, trends and techniques in the field, or publications from professional organizations—and has the groups develop categories and sort them by type (Mark & Jacobson, 1995). If possible, use articles relevant to the topics the class will be researching. Such examples help reinforce the usefulness of library research. Students may even want copies of articles used in class.

Goal: To develop many examples to illustrate a point, to demonstrate the flexibility of a certain resource, or to demonstrate that there are many possible approaches to a problem.

Technique: Brainstorming. Groups come up with as many responses to a given question or problem as possible. The group goal is not to decide on the "best" response or answer, only to come up with several. Students may need some encouragement at the start of this exercise. According to Allen (1995, p. 97), "Brainstorming is a good way to open up a discussion. The objective is to collect as many ideas as is possible. Criticism is not allowed and all ideas are welcome." A typical assignment is described by Warnken and Young (1991, p. 93): "Each group has 5 min to come up with a list of five questions about the library. At the end of 5 min each group shares its questions with the entire class. This activity gets the class directly involved in the learning process (a key ingredient in successful learning); relates the information about to be provided to their stated needs (questions about the library); and provides a framework for the presentation (since experience has shown that their questions

about the library will be answered by the presentation you have prepared).” Alternatives to this exercise include making lists of the types of materials a library could have, or listing possible sources of information on a given topic, or listing ways to narrow a broad topic, or listing possible primary and secondary sources (Ridgeway, 1989, pp. 33–34), and so on.

Goal: To understand an organizing or classification system.

Technique: Groups creating their own rules. A group can make up filing rules for a set of catalog cards or the parts of a periodical citation (Warnken & Young, 1991, p. 94) or decide on appropriate subject headings for a book (Ridgeway, 1989, p. 42). After the exercise, the class and instructor can evaluate the results together. The librarian may or may not reveal the standard answers to these problems.

Whether you prefer active, cooperative, or even the modified lecture approach in your library instruction, review your goals and the needs of your students periodically. Do not get so caught up in the teaching techniques that you forget you goal. As your library and your classroom settings change, review your program and adapt the exercises as necessary. Beware of slipping back into the lecture mode, especially for the wrong reasons: because it seems easier or because of time pressure. Active and cooperative learning techniques may be initially harder to use but are ultimately more worthwhile for your library instruction program.

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