

CENTRE FOR TEACHING AND LEARNING

Focus on Active Learning

Active Learning Strategies

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Included here are strategies designed to support students' active learning in a variety of contexts: lecture; tutorial/seminar; and team- or group-based learning. All strategies can be adapted to multiple contexts, face-to-face or virtual, and are presented simply as catalysts to your own creativity. The single most critical factor in selecting a strategy is ensuring that it directly supports the intended learning outcomes.

Making Lectures Interactive

Readiness Assurance Tests (RATs)

This is a multi-step instructional sequence repeated several times per term to focus the majority of class time on helping students use the concepts from assigned readings. The strategy helps insure that students do the assigned readings before coming to class.

After setting a reading assignment, begin class time by having students take a short test (either SAQ or MCQ) that they must complete on their own. While the individual tests are being graded, students work in teams to either re-take the test as a group or to discuss it. The group discussion and peer input can help correct misinformation and deepen all students' understanding of the material. Group tests may also be scored. The rest of class time is used in ways that require students to apply the learning gained through the readings.

One-Minute Paper

This is a highly effective technique for checking students' progress in understanding and reacting to course material. Ask students to take out a blank piece of paper, pose a question (either specific or open-ended) and give them one minute to respond. You can then use the results to generate discussion within the class. Another variation on the one-minute paper is to ask students to articulate the main point of the day's session; this will tell you whether students are viewing the material as you intended. You could also ask students what was the "muddiest" point in today's lecture?

Buzz Groups

Buzz groups are simply small groups of two or three students formed, impromptu, to discuss a topic for a short period. They are very useful for getting things going, and can tune students in to your subject matter and gauge their familiarity with the topic.

Think-Pair-Share

Pose a question to students; give them time to think and write a short response before turning to a peer to compare responses. After a short time to share, have pairs share with the larger group. In a pair it is almost impossible for a student to stay silent and the one-on-one experience is a lot less intimidating than speaking out to the whole group. Additionally, once students have spoken in private they are more likely to speak afterwards in the whole group.

Note Sharing

After a particularly important or complex part of a lecture, invite students to compare the notes they took with those of a neighbor. Allow a few minutes for students to explain their thinking to one another and perhaps to supplement their own notes.

Convince your neighbor

Pose a problem to the class, asking students to solve it on their own. After a set time, ask students to share and defend their answer with their neighbor. Debrief.

Sea of Cards

At the beginning of a term or lecture students are given a green, a red, and a yellow card. Students are instructed to hold up (make visible) the green card when they understand the material, the yellow card when they are unclear on a point, and the red card when they disagree or really do not understand what the instructor has said. By asking the students to do this they are constantly assessing their level of understanding of the material. At the same time, the instructor gets immediate feedback on how the class is doing, and can respond by repeating or going over specific points if they see that there has been a change of colour of the cards presented.

Make-up Exam Questions

Ask students to become actively involved in creating some or all quiz or exam questions. In asking students to think up exam questions you encourage them to think more deeply about the course material. In groups or individually ask students to design questions that use the terms compare or contrast, discuss, evaluate, and/or apply. Do not encourage questions that include the words list or define. The instructor may use the questions as the basis of review sessions and/or to model the most effective questions. You can distribute all the questions and ask students to discuss the merits of sample questions submitted; in discussing questions, they will significantly increase their engagement of the material to supply answers. Students might be asked to discuss several aspects of two different questions on the same material, including degree of difficulty, effectiveness in assessing their learning, proper scope of questions, and so forth.

Mind Mapping

As a way of bringing out ideas or principles on a topic ask students or groups of students to produce a simple, graphic representation or illustration of key concepts. This can be done either on large chart paper to be displayed or posted to Moodle. This is a way for students to make personal sense of the material and link it to what they already know.

Using Cue Cards to Share Ideas or Generate Questions

You can ask students before a lecture to write down the questions they want you to answer. You can announce this at the end of the previous lecture or let it be known that this is what will happen for each lecture. You can ask students to write down questions or give their response to a general statement or question during a lecture, collect them, and then redistribute them in the lecture. Then ask students to read out the question that they have. Because students won't be reading their own question, this technique is a safe way to generate questions and promote discussion.

Partial Solutions/Puzzles

A useful means of increasing the level of understanding of material on a given topic is to present them with a puzzle involving concepts and have students work towards a solution. By encouraging students to discuss and work out the solution you increase the likelihood that they will be able to critically assess theories when they are presented later. For example, you can present literature or experimental data that seem to

contradict parts of the theory or use examples which seem to have features that support two opposing theories.

Guided Lecture

In a guided lecture a 20 –30 minute presentation is given by the instructor in which students are instructed NOT to take notes. This is followed by 5 minutes of active writing by the students on what they have learned or remembered from the presentation. The remainder of the time is spent in small groups clarifying and elaborating on the material. Another version of the guided lecture is to give two mini lectures within a class separated by group study sessions built around a study guide.

Case Studies

Using written descriptions of a problem situation, complete with background and context, students are required to analyze and propose solutions.

Question of the day

At the end of the session pose or post a question that is based on the day's topic. It can be a question similar to one that might appear on the final exam, one that requires students to synthesize the day's material or one that provokes an opinion. Discuss the answer to the question to start the next session or post the answer to a website or listserv a few days after the class.

Small Group Teaching

Small group teaching is very important for encouraging students to think – to compare ideas, give expressions to their understanding of a subject, evaluate and develop personal and professional values. Small group sessions can also be employed to acquire and practice team working, leadership and communication skills.

Rounds

A round involves each student in the group taking a turn to speak briefly on a given issue. Rounds work well to start a session, because they involve each person speaking once before anyone speaks a second time. This establishes a balanced pattern of interaction.

Take a Poll

In introducing a new topic, pose a yes-no question. Ask students to take 5 minutes to get up, walk around and pose that question to as many class members as possible, keeping tally as they go. Debrief by inviting students to share their results and reasons for their own responses. Use the results as the lead-in to the session.

Bell ringer

Adapt the classic lab exam format to deliver new material, practice skill development or present issues for discussion. Prepare activities, questions or new information for each station being sure that the demands of all stations will take approximately the same amount of time to complete. Divide the students into groups and have each group begin at a different station. Groups rotate through each station at timed intervals until all groups have gone through all stations.

Carousel

Less formalized than a bell ringer, this strategy involves students walking freely through the class to contribute responses to questions that have been posted around the room. The flexibility of the activity enables students to build upon others' contributions and revisit stations multiple times.

Forced Debate

- a. Ask all students who agree with a particular proposition to sit on one side of the room and all opposed to sit on the other side. It's helpful to post signs indicating the position taken. After groups have sorted themselves out, switch the signs and ask students to argue for the position with which they disagree. This is a great activity to get students to consider alternative perspectives. Leave plenty of time to debrief.
- b. Assign students to one of 3 groups: pro, con or moderator. Each of the pro and con groups prepare to argue their position while the moderator group devises questions for each group. Pro and con groups each get a set amount of time to present their positions before the moderator group begins to pose their questions. Pro and con groups each get 3 more minutes to summarize and rebut. The moderator group determines which group proposed the most reasoned argument.

Take a Stand

Pose a question (or a series of questions) that require(s) students to take a stand, on an imaginary Likert scale, to indicate the degree to which they agree or disagree. Ask students then to match up with someone who holds a different opinion from their own to consider alternative viewpoints. Debrief.

Learning Tasks

Described by Jane Vella, learning tasks are instructor-devised activities that invite students to immediately apply their learning. They usually take the form of an open-ended question that can be answered using the immediately available resources of the course to date.

Jigsaw

In a Jigsaw, each member of a group is asked to complete some discrete part of an assignment, or collect some piece of information so that when every member of the group has completed his/her assigned task, the pieces can be joined together to form a finished product. This might involve each student becoming an "expert" in one particular area in order to share that expertise with the other members of the group.

Through their active involvement, students are encouraged to monitor their own learning and gain a degree of self-direction. Two main factors are to be considered: content of the educational session, and the characteristics of the learning and teaching process. Both depend on the purpose (i.e. educational aims and objectives) of the small group session.

Small group teaching can mean a group of 4 students to a group of 30 students, depending on the context. What you can do with the students largely depends on the size of the group. Two traditional forms of small group teaching are the tutorial and the seminar

Tutorials

The tutorial "is concerned with the development of the students' powers of thought" (Jacques, 1991). It is, in general, aimed at 1-6 students. In a one-to-one tutorial the tutor may focus completely on work prepared by the student. With an increase in the number of student participants, less time can be devoted to each student's work and the tutorial slowly transforms into a seminar.

Seminars

"...The word 'seminar' is generally taken to mean a group discussion with fairly intellectual aims, led formally or informally by the tutor, and focused on issues arising from the subject matter rather than difficulties" (Jacques, 1991).

Rather than providing an occasion to study a subject in depth, typical learning objectives for seminars are to:

- Facilitate the exchange of ideas
- Provide a stimulus for creative thinking
- Improve students' self-expression

Teaching through tutorials and seminars favours discussions over presentations. However, the presentation of students' work by students themselves can provide a valuable introduction to a discussion session. Thus, the role of the teacher is to:

- Help define problem areas rather than providing solutions
- Talk less; ask more
- Encourage students to question and introduce creative or original ideas.

Core responsibilities of a tutorial or seminar leader are to:

- Define and communicate the purpose, task and agenda for the session
- Ensure that there is common ground as the basis for discussion
- Clarify issues
- Maintaining the collaborative spirit of small group work

Typical uses of small group teaching:

- Checking student progress
- Sorting out difficulties
- Discussing finer points of a topic
- Discussing wider issues
- Motivating the student to take a broader approach to learning

Advantages of small group teaching:

- Close teacher/student contact
- Good opportunity for focus on a particular student
- Easy to monitor progress

Success of small group teaching depends largely on the students' capability and willingness to participate in and contribute to discussions. The planning of small group teaching sessions should therefore consider:

- What do students need to know beforehand?
- What prior expectations will they have from other students/studies?
- What distractions might be there?
- What rules for confidentiality might need to be applied?
- What are students expected to do after the meeting?
- How does the tutorial/seminar link with the rest of the curriculum?

Team-Based Learning

Basic Elements of Cooperative Learning

Positive Interdependence

Students must feel that they need each other in order to complete the group's task. They must feel that one cannot succeed unless the other members of the group succeed (and vice versa). In other words, they must perceive that they "sink or swim together". Some ways to create this feeling are through establishing mutual goals (students must learn the material and make certain that group members learn the material), joint rewards (if all group members achieve above a certain percentage on the test, each will receive bonus points), shared materials and information (one paper for each group or each member receives only part of the information needed to do the assignment), and assigned roles (e.g. summarizer, encourager of participation, elaborator).

Frequent Promotive Interaction

Beneficial educational outcomes are due to the interaction patterns and exchanges that take place among students in carefully structured cooperative learning groups, face-to-face or online. Students help, encourage and support each other's efforts to learn by summarizing, giving and receiving explanations, and elaborating (relating what is being learned to previous learning).

Individual Accountability/Personal Responsibility

Cooperative learning groups are not successful until every member has learned the material or has helped with and understood the assignment. Thus, it is important to stress and assess individual learning so that group members can appropriately support and help each other. Some ways of structuring individual accountability are by giving each group member an individual exam or by randomly selecting one member to give an answer for the entire group.

Interpersonal and Small Group Skills

Many students lack the social skills they need for effective group functioning. They must have and use the appropriate communication, leadership, trust-building, decision making, and conflict management skills. Teachers therefore need to teach these skills just as purposefully as academic material.

Group Processing

Groups need to be given time and procedures to analyze how well they are achieving their goals and how well they are using the necessary social skills. Group processing helps all members achieve while maintaining effective working relationships among members. Feedback from the teacher and/or student observers on how well they observed the groups working helps group-processing effectiveness.

Learning Teams/Peer Teaching

Research has shown that students who are required to teach something learn concepts better than if they are taught the material in conventional ways. Give assignments within the class where students work in groups and are required to prepare their own

questions on the main points of a reading or class material, alternating asking and answering the questions they have prepared. Within the learning team students can be assigned roles, where one student makes up questions regarding the material, one student discusses two points they agreed with, one student discusses two points they did not agree with and one student is required to make up or discuss a specific example of how the ideas or concepts are applied. Students are more willing to share their views in small groups and often display deeper insights about the material than when working alone.

Case Studies or Critical Incidents

Case studies are appropriate for learning information analysis, decision-making, or problem solving. This requires the development of a set of cases or critical incidents that reflect problems or issues in the course material. The students, as a group, would be expected to infer information based upon knowledge and techniques they had learned in other parts of the course. Classes can be divided into small groups to work on the cases and the instructor can circulate among them to facilitate the process. Over the course of a semester, cases can be made more complex and challenging as students become more knowledgeable. Cases must provide enough information to elicit analytical thought, but not so much that the solutions are obvious. Students will need to have mastered a common knowledge base before they will be ready to tackle a case study, and they need to understand clearly the steps in the analytical process they will use.

Debates/Panel Discussions

Panel discussions are especially useful when students are asked to give class presentations or reports as a way of including the entire class in the presentation. Student groups are assigned a topic to research and asked to prepare a presentation. Each panelist is then expected to make a very short presentation, before the floor is opened to questions from the audience. The key to success is to choose topics carefully and to give students sufficient direction to ensure that they are well prepared for their presentations. You may also want to assign roles to members of the audience as a means of generating discussion.

Formal debates provide an efficient structure for class presentations when the subject matter easily divides in opposing views or pro/con considerations. Students are assigned to debate teams, given the position to defend, and then asked to present arguments in support of their position on the presentation day. The opposing team should be given an opportunity to rebut argument(s) and, time permitting, the original presenters asked to respond to the rebuttal. This format is particularly useful in developing argumentation skills in addition to teaching content.

Games

When a game is introduced into a classroom environment, participants relax, they get excited, they compete and, most importantly, they remember the event and the information tied to it. Jeopardy-style games can be used during or outside class time to verify existing knowledge and reinforce newly learned knowledge. Playing the game shows the students what they did and didn't learn and is a fun and challenging way to get students to work together. Some examples of games that can be played in the

classroom environment or on a webpage include Jeopardy and Trivial Pursuit. Many templates for these games are available to download from the web.

Fishbowl/Concentric Circle

A fishbowl is a small circle of chairs occupied by students who will have a discussion, conduct a lab experiment or engage in some other observable event. That inner circle is then surrounded by a larger circle of students who will listen in or observe the ongoing activity. You can offer a way for those in the outer circle to join in the discussion or lab activity by simply “tapping out” those in the fish bowl.

Poster Presentations/Tours

It helps groups working together on a task or project to produce a poster of the outcomes of the discussion or work done by the group. Posters can involve a design, a proposal, the results of experimental or laboratory work, analysis of case studies, or the main features of a discussion or literature review. Debriefing the work of the group can take the form of displaying the poster. Poster tours can be used for work done in one particular class or can be used to present and discuss a group project that assigned groups have worked on for a term. This is a process used at academic conferences to share outcomes of research work, and learning to communicate in poster form is a useful academic skill. Once the posters are displayed students simply tour them. To make the tour more active you can ask one member of each group to stay by their poster to answer questions and discuss the poster. Other groups provide feedback or assessment during the tour.

The Selective Reading Guide

This strategy ensures that students study important course content through their out-of-class work. It consists of a series of statements or simply states a purpose which guides students through the reading of a specific text and which highlights the most significant information in the text. This approach increases comprehension of and interest in assigned texts.

(Adapted from: Eison, J. (1998). Teaching both course content and collaboration. Presentation at the Annual Conference of the Professional and Organizational Development (POD) Network in Higher Education.)

Academic Controversy

This is a systematic and sequential instructional method of stimulating critical and creative thinking, promoting student collaboration, and ensuring that students view an event or problem from multiple perspectives. “Academic controversy exists when one student’s ideas, information, conclusions, theories and opinions are incompatible with those of another student, and the two seek to reach an agreement” (Johnson, Johnson & Smith, 1996:5).

The process involves forming students into cooperative learning groups of four and then dividing each group into two pairs. The instructor then guides the students through the following steps:

- Research and prepare a position. Each pair develops the position assigned, learns relevant information about it, and plans how to present the best case possible to the other pair.

- Present and advocate their position. Each pair makes a presentation to the opposing pair, with each member of the pair participating.
- Engage in an open discussion, refuting the opposing position and rebutting attacks on their own position. Students argue forcefully and persuasively for their position, presenting as many facts as they can to support their point of view.
- Reverse perspectives. The pairs reverse perspectives and present each other's positions.
- Synthesize and integrate the best evidence and reasoning into a joint position. The four members of the group drop all advocacy, synthesizing and integrating what they know into factual and judgmental conclusions summarized into a joint position on which all sides can agree.