Active Learning Techniques for Higher Education

One-minute paper
With this technique the instructor interrupts the lecture and asks students to take a minute to write their ideas or solution to a problem on a sheet of paper. The instructor collects these sheets as the students leave the classroom and uses the answers to access student learning. Student answers should be brief and only take a minute or two to write. The one-minute papers are usually unsigned.
Question/feedback box
Students are asked to write questions they have concerning the lecture material, readings or assignments and deposit them (usually unsigned) in a box that the instructor brings to class, attaches to his/her office door, or leaves in the departmental office. Some instructors may prefer to have questions e-mailed or posted on an electronic class bulletin board. This gives students who might be shy about asking questions in class, or coming to the instructor's office, a chance to have their concerns addressed. It is very important that the instructor take time in class to answer, respond to, or at least summarize all the questions received, or students will stop asking questions and providing feedback.
Think/pair/share
The instructor asks a question or poses a problem and requests that students think about it for a minute. Then students are asked to turn to the person next to them and share their thoughts/ Think/pair/share gives students time for reflection and an opportunity to share their ideas with a classmate. At the end of a few minutes, several pairs of students can be asked to share their thoughts with the entire class.
Cartoons, graphs, photos, and newspaper articles as class starters
Display a cartoon, graph, sketch, photo, short newspaper article, or other interesting visual, ideally using an overhead projector or computer, as students come into class. The item used should be relevant to the course and ideally relate to students' life experiences. The visual helps set a tone for the class, and it gets students involved before the class starts. The visual can be used as a prompt for a full-class discussion, as stimulus for small group work, or the basis for a few questions that serve as an introduction to the lecture.
The Pause Procedure
The pause procedure (Rowe, 1980; 1986; Ruhl, Hughes, & Schloss, 1980) is an extremely easy and effective approach to promoting greater student engagement with minimal modification to one's traditional lecture presentations. The pause procedure has the instructor pausing for approximately two minutes on three occasions during a fifty-minute lecture (i.e., every 12-15 minutes). During the pauses, students work in pairs to discuss and rework their notes without instructor-student interaction. In one study, the mean score comparison between the pause procedure treatment group and a control group was large enough to equal two letter grades.

Starting the class with student input
The instructor starts the class by asking student volunteers to summarize the key points in the assigned reading for the day. After the students present their points, the instructor elaborates, restates difficult terms or concepts, answers questions, adds details, and provides applications. The student input gives students the opportunity to get involved at the start of the class, gives the instructor feedback on the students' understanding of the readings, and encourages the instructor to proceed at the pace of the class.
End of class summaries
Individual students in small group of students (no more than four or five) are asked to summarize or paraphrase the three or four main points from the lecture they just heard. These summaries can be written in the last few minutes of class and handed in before students leave, or they can be done outside class and handed in at the start of the next class. Individuals or groups can also be asked to volunteer one point from the last lecture at the start of the next lecture period or to provide a short review for the entire class.
Controlled class discussion
This technique can be used with large or small classes, but in both cases student responses are usually limited to a few words. It is not the intention of a controlled discussion to involve everyone in a long or in-depth debate. Discussion can be prompted by instructor or student questions. Start with questions that only require a one or two word answer, and then continue with questions that need more analysis and thought. For example, students could be asked how they think certain groups (e.g. the elderly, single mothers) might react to various changes on social policies. Then ask students to explore potential ramifications of such policy changes for society as a whole.
Concepts and applications
This technique may be difficult in some institutions because it requires use if two rooms. The first step is to divide the class in half and send one group to another room. For the students who remain in the main classroom, give a short lecture on a central course concept, model, or theory, but do not provide any examples or applications. For the group that goes to another classroom, provide pictures, graphs, newspaper articles, or diagrams that illustrate the concept, model, or theory from the lecture, but do not provide the concept, model, or theory itself. Then have the class come together, pairing students from each group. Ask the students to explain to each other what they have learned.
Simulations
Simulations attempt to replicate or illustrate a real world situation or process in a more transparent classroom setting. They can involve the simple use of a prop (e.g. an economics professor using a bouncing tennis ball to illustrate the macroeconomics concept of the national income multiplier, or an animal science instructor asking students to use a computer model to predict breeding outcomes from animals with known dominant and recessive genes). Simulations stimulate student interest because relationships or concepts are

illustrated in uncomplicated, and often unique, ways. Simulations can be fun and engaging, but it is important that the overall concept or theory being illustrated be made clear at the end of the class. Students can get so caught up in the simulation that they may miss the overall idea or concept the simulation was intended to illustrate.

Role plays

Students are assigned roles that require them to argue or defend positions that illustrate political, environmental, economic, historical, religious, ethnic, gender, age, cultural, or other differences. Students should be asked to research and make at least a temporary intellectual commitment to the roles they are assigned. Evaluate students, or teams of students, on the thoroughness of their presentation and defence of the assigned position. Although students may resist being assigned a position that is different from one they currently hold, role play exercises often lead to more learning when students have to support and defend an unfamiliar or unpopular position.

Case studies

The case method presents students with actual problems or situations which have occurred or presently exist in a profession or field of inquiry. Cases provide an opportunity for students to address real-life situations, solve problems, and make decisions in the safety of the classroom. There is never one correct answer or simple solution to the case problems. The method requires students to research information relevant to the case, apply theoretical knowledge, analyze problems, and evaluate possible outcomes or solutions. Students usually work in groups and present a written (or oral) report in a format requested by the instructor. A written case is usually presented to the students by the instructor, and it requires considerable instructor preparation to be a useful learning tool. Typical cases present an overview of an incident or situation including relevant facts and other information. Students are given an opportunity to question the instructor for additional information, but the outcome of each case or problem is unknown. Outside class, students must find information and read articles relevant to the case. In class, they are actively involved in presenting their own ideas as well as listening to the views of other students in their group.

Guided design

Guided design involves active learning and sustained participation in small groups. Like other methods of teaching effective thinking, Guided Design involves a series of tools and a strategy for their successful use. Students are explicitly led through steps to solve problems and reach logical decisions. The process is an active one requiring student participation and involvement at each step. If Guided Design becomes the dominant teaching method for a course, students are responsible for learning the course content outside the classroom and lectures are usually limited to explanations of the Guided Design process. Guided Design can also be used for just a portion of the course, with other teaching methods used the rest of the times. Small-group work occurs in the presence of the instructor, who provides feedback and encouragement as students proceed through each step of the thinking process. Guided

Design is usually implemented in groups of four to five students, thus fostering the development of communication and interpersonal skills.

The basic Guided Design problem solving steps are: (1) defining the situation (2) stating the problem and the exact goal to be achieved; (3) generating ideas that might be used to reach the goal, and then selecting the one judged to be best; (4) defining the new situation that might result if the selected idea is implemented; (5) preparing a detailed plan to reach the goal based on the best idea generated; and (6) implementing the plan. Since a course involves a series of problem solving exercises, students have repeated opportunities to evaluate and hone their skills while receiving feedback from the instructor.

ConcepTests

ConcepTests were developed, and their effectiveness clearly demonstrated, by Erik Mazur (1997) to encourage active learning through in-class peer collaboration in physics courses. In this approach designed to focus students' attention on developing conceptual understanding rather than memorization, at intervals of approximately every 15 minutes, Mazur stops his presentation and poses a ConcepTest. The ConcepTest consists of a challenging conceptual question or problem posed in multiple-choice format. Students turn to a partner seated nearby and they work together to reach a common answer (these responses get recorded electronically). Mazur (1997) offers a helpful resource for instructors of physics attempting to transform —conventional lectures to a more interactive format; the methods described, however, can be applied by faculty teaching in a wide variety of different disciplines.

Using popular films and video-vignettes to stimulate critical/creative thinking

Using illustrative excerpts from popular films is all-but-certain to elevate student interest and can easily stimulate focused critical thinking and personal reflection by students. For example, in a faculty workshop setting, participants can be challenged to reflect upon and talk about specific elements of effective college and university teaching after viewing brief classroom vignettes taken from the memorable performances provided by (a) Edward James Olmos in Stand and Deliver, (b) Richard Dreyfuss in Mr. Holland's Opus, (c) Robin Williams in Good Will Hunting, (d) Barbra Streisand and Jeff Bridges in The Mirror has Two Faces, and (e) Julia Roberts in Mona Lisa Smile.

Connecting course content to current events

One approach to energizing students' attention and helping students develop a clearer sense of the personal relevance and significance of course content involves introducing a daily (or weekly) Breaking News items. After personally modeling and establishing a pattern of how this is best done at the start of each semester, assign students the task of (a) locating current news items illustrating or relating to important course content, and (b) making a brief in-class oral presentation about the news item found. Alternatively, each student can be required to prepare a brief written synopsis of his or her news item for posting on an electronic discussion board or course website.

Creating field trips (real, simulated or virtual)
Taking students outside of the traditional classroom on a carefully designed educational field trip can achieve a wide range of powerful learning outcomes (e.g., DeWitt & Storksdieck, 2008). On a foundational level, field trips offer the obvious opportunity for students to create strong authentic connections between oftentimes-abstract academic material and their own life experiences. For example, under the direction of a creative instructor, a short and simple walking tour around campus can provide a wealth of educational opportunities to illustrate concepts previously presented only through textbook readings and/or in-class presentations. And virtual field trips provide faculty with the opportunity to use available technology tools address many of the instructional and logistical problems associated with actual field trip excursions. Thus, a virtual field trip to an art museum, a historical site, a national park or a location of great geological significance will all add both excitement and instructional impact to a class.
Debates
1) Ask students to take a point of view on a specific issue related to the class discussion. 2) Give them 5 minutes to write down that point of view on a piece of paper and their reasons for holding the position. 3) Then ask the students to assume the opposite point of view and do research on it in preparation for a debate. 4) Following the Lincoln/Douglas style of debate, ask students to pair up with someone holding a position opposite their researched one and debate the issue one-on-one. 5) The debate should last about 20 minutes (each speaks for 5 minutes, and then each has 5 minutes to respond). Debate can help at the beginning of a unit on a controversial subject, in the midst of a discussion about a complex topic when students tend toward simplistic treatment, when there are strong opposing opinions on issues of importance.

References:

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- *Jim Eison, 'Using Active Learning Instructional Strategies to Create Excitement and Enhance Learning', 2010.*
- *Morrison-Shetlar & Marwitz , 'Teaching Creatively: Ideas in Action', 2001.*

Handout put together by Rowshan Rahmanian, April 2017