

Active Learning

Yale Center for Teaching and Learning

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Active learning is defined as “anything that involves students in *doing things* and *thinking about the things they are doing*” (Bonwell and Eison 1991, emphasis added):

- *Doing things*: Activities like discussion, idea mapping, and debate require students to construct knowledge through higher order thinking (recalling, applying, analyzing, evaluating, synthesizing, and verbalizing concepts). This contrasts knowledge passively transmitted to students solely via listening, transcribing, memorizing, and reading.
- *Thinking about the things [students] are doing*: Metacognition—students’ thinking about their own learning—promotes active learning by acquainting students with their own learning habits, and promoting their ability to self-assess and self-regulate as learners. Feedback methods support metacognition while opening up student-instructor dialogue.

Recommendations

1.) Activities for lectures without major modifications to course structure

- **Clarification pauses and collaborative note-taking** - The instructor pauses during lecture and asks students to summarize in writing what they have just learned and/or consolidate their notes. Students may exchange notes to compare, in order to catch key ideas missed or misunderstood. The instructor then fields clarifying questions.
- **Retrieval practice / one-minute papers** - At the start of class, students write down major points they can remember from the previous class. Similarly, at the end of class students write down key takeaways and consider logical next steps. The instructor might review responses in class and encourage questions.
- **Think-pair-share and small groups** - Students work individually on an assignment or formative activity (such as one-minute papers or an example problem). They then compare responses with a partner, synthesize a joint solution, and share with the entire class. Alternatively, instructors can organize breakout moments with small groups, allowing students to explore content in-depth, collaborate on problems, or practice articulating their knowledge. This strategy is highly flexible and can be shaped to meet class needs.
- **Demonstrations** - Students predict the outcomes of a demonstration. After the demonstration, students discuss the observed result and how it may have differed from their prediction. The instructor then follows up with a detailed explanation.
- **Polls** - Utilizing PollEverywhere or some other audience response system, the instructor poses a multiple-choice question. Students work on the problem individually or in think-pair-share small groups, and use clickers or online surveys to report their answers. The instructor shows the class distribution and explains the solution.

2.) Activities to supplement lecture time with active-learning

- **Large-Group Discussion** - Students discuss a topic in class based on a reading, video, or problem. The instructor may prepare a list of questions to facilitate discussion.
- **Sequence reconstruction** - Instructor gives students jumbled steps in a process, and asks them to work together to reconstruct the proper sequence.
- **Error identification** - Instructor provides statements, readings, proofs, or other material that contains errors. Students must find and correct the errors.
- **Concept map** - Students are provided with a list of terms and must arrange the terms on paper, drawing arrows between related concepts and labeling each arrow to explain the relationship. Alternatively, students can use software like MindMeister or bubbl.us to project their maps on a screen or share with the class.
- **Categorizing grids** - Instructor gives students several important categories and a list of scrambled terms, images, equations, or other items. Students sort the terms into the correct categories.
- **Interactive Lecture** - Instructor breaks up the lecture at least once per class for an activity that lets all students work directly with the material.
- **Active Review Sessions** - Instructor poses a question which students work on in groups or individually. Students are asked to show their responses to the class and discuss any differences.
- **Inquiry Learning** - Instructor presents a major concept and then asks students to make observations, pose hypotheses, and speculate on conclusions.
- **Brainstorming** - Instructor provides a topic or problem and then asks for student input. After a few minutes, the instructor asks for responses and records them on the board.
- **Role Playing** - Students use dramatic techniques to get a better idea of the concepts and theories being discussed. They might stage dialogue in a case study, act out a scene in a literature class, produce a mock debate of a historic issue, or present (within a safe context) problematic social responses requiring discussion.
- **Jigsaw Discussion** - Students divide into small groups that discuss different but related topics. Students then shuffle to create new groups with one student from each of the original groups. In these new groups, each student is responsible for sharing key aspects of their original discussion. The second group must synthesize and use all of the ideas from the first set of discussions in order to complete a new or more advanced task.

3.) Activities to strengthen student motivation and metacognition

- **Learning goals** - Students create a list of skills and topics they would like to cover in the course, and air any concerns they have about the syllabus and course design. Instructors can also share and explain their own intended learning outcomes and invite students to add their own. Often, activities like these can be particularly effective in the first class / first five minutes of a class session.
- **Ice breakers** - Students learn each other's names and interests to facilitate group/partner work later in the semester.
- **Discussion ground rules** - Instructor cultivates an inclusive class climate by working with students to create ground rules for discussion.
- **Case studies** - Instructor engages students with real-life stories that help them integrate their classroom knowledge with their knowledge of real-world situations, actions, and consequences. Case-based learning is common in management, law and medicine, but can be utilized in a variety of settings.
- **Experiential Learning** - Instructor facilitates site visits that allow students to see and apply theories and concepts. For example, students can visit museums or libraries, engage in field research, or work with the local community. Experiential learning may also include 3D printing, under the right knowledge circumstances.
- **Self-Assessment** - Students receive a quiz (ungraded) or a checklist of ideas to assess their understanding of the subject. Instructors can consider formative assessment, which offers opportunities for reflection during learning and class, or summative assessment, which examines knowledge gained at the end of a unit or term.
- **Student-generated test questions** - Instructor provides students with a copy of learning goals for a particular unit and a figure summarizing Bloom's Taxonomy. Groups of students create test questions corresponding to the learning goals and different levels of the taxonomy.
- **Peer Review** - Students complete an individual homework assignment or short paper. Before the assignment is due, students submit one copy to their partner or group, and then provide each other with critical feedback.

References

Bonwell, C. C., & Eison, J. A. (1991). Active learning: Creating excitement in the classroom (ASHE-ERIC Higher Education Rep. No. 1). Washington, DC: The George Washington University, School of Education and Human Development.