

Active Learning Strategies

Bonwell and Eison defined active learning as “instructional activities involving students in doing things and thinking about what they are doing” (Bonwell and Eison, 1991). Approaches that promote active learning focus more on developing students’ skills than on transmitting information. Active learning involves students doing something—reading, discussing, writing—that requires higher-order thinking. Active learning strategies also tend to place some emphasis on students’ explorations of their own attitudes and values. The use of active learning strategies enhances student retention of course material, improves thinking and writing abilities, enhances student attitudes towards learning, increases motivation for further study, and helps students to develop awareness of their approach to learning (Prince, 2004). Active learning strategies range from low-risk activities that are structured, have a low potential for controversy, and require relatively short periods of class time (e.g., think-pair-share) to longer, less structured and potentially higher-risk activities (e.g., a role play demonstrating a concept from lecture).

The active learning strategies listed below could work in classes of any size and across most disciplines. Although the approaches listed here are intended for face-to-face classes, most can be adapted for remote teaching (see Active Learning Online for more information). For more strategies and research on the benefits of active learning, see <https://cft.vanderbilt.edu/guides-sub-pages/active-learning/>.

Think-pair-share

Ask students a question that requires higher order thinking (e.g., application, analysis, or evaluation). Ask students to think or write about an answer for one minute, then turn to a peer to discuss their responses for two minutes. Ask groups to share responses and follow up with instructor explanation. By asking students to explain their answer to a neighbor and to critically consider their neighbor’s responses, this approach helps students articulate newly formed mental connections.

The Pause Procedure

Pause for two minutes every 12 to 18 minutes, encouraging students to discuss and rework notes in pairs. This approach encourages students to consider their understanding of the lecture material, including its organization. It also provides an opportunity for questioning and clarification and has been shown to significantly increase learning when compared to lectures without the pauses.



Retrieval practice

Pause for two or three minutes every 15 minutes, having students write everything they can remember from preceding class segment. Encourage questions. This approach prompts students to retrieve information from memory, which improves long term memory, the ability to learn subsequent material, and the ability to translate information to new domains.

Demonstrations

Ask students to predict the result of a demonstration, briefly discussing with a neighbor. After demonstration, ask them to discuss the observed result and how it may have differed from their prediction; follow up with instructor explanation. This approach asks students to test their understanding of a system by predicting an outcome. If their prediction is incorrect, it helps them see the misconception and thus prompts them to restructure their mental model.

Minute papers

Ask students a question that requires them to reflect on their learning or to engage in critical thinking. Have them write for one minute. Ask students to share responses to stimulate discussion or collect all responses to inform future class sessions. Like the think-pair-share approach, this approach encourages students to articulate and examine newly formed connections. Sample questions include:

- What was the key point from today's session?
- What was most challenging for you in this material?
- What concepts would you like explained again?
- What would you like to know more about?
- Describe the connection between today's class and your life outside of this course.
- Describe how your personal bias might affect your interpretation of the material presented today.

Problem Solving

Pause the lecture and ask students to take a minute to write a solution to a problem on a sheet of paper. Collect these sheets as the students leave the classroom and use them to assess student learning. These papers do not have to be formally graded; rather, it is best to scan through them to find themes, such as common misconceptions or ineffective solution strategies. At the next class, offer feedback to the whole class based on common themes you noticed. Take a few minutes to model the thinking process for solving the problem. While there is no one correct way to think about a problem, this thinking out loud is valuable as a modeling process that allows students to observe how an expert thinks. By hearing your thinking process, students learn to think effectively themselves.



Reading Summaries

Start the class by asking students to summarize the key points in the assigned reading for the day. After the students present these points, you elaborate, restate difficult terms or concepts, answer questions, add details, and provide applications. The student summary gives students the opportunity to get involved at the start of the class, gives you feedback on the students' understanding of the readings, and encourages you to focus on the material that students are struggling with.

After the key points from the readings are summarized, students can be asked to provide applications of the concepts or ideas. This continues student involvement and helps them reflect on the relevance of the course material to other courses or applications.

End of Class Summaries

Individual students or small groups are asked to summarize 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 completed outside of class time and handed in at the start of the next class. You can gain valuable feedback on what students learned from the lecture, and what may need to be clarified during the next class session.

Active Learning Online

The active learning strategies listed above can be adapted for a remote teaching and learning context. Remember that active learning involves the students using higher-order thinking skills such as summarizing or predicting. You can build time into synchronous teaching sessions for students to engage in retrieval practice, or to write a Minute Paper.

Consider opening the chat feature for short question periods during synchronous teaching sessions. Try Google Docs for students to collaborate on a Reading Summary.

For asynchronous teaching, such as video-recorded mini-lectures, consider posting questions to consider at the beginning of the video to guide students' viewing, or questions for reflection for students to respond to after the video. These questions can help to transform a passive lecture viewing experience into a more active viewing experience.



Active learning strategies often make use of peer learning and collaboration. Many online platforms, including Zoom, allow the instructor to pre-assign students to breakout groups. Consider including Think-Pair-Share or Demonstration prediction activities in synchronous teaching sessions. Students can share their group's main discussion point in a collaborative Google Doc for the class to view.

Resources

Bonwell, C.C., and J. A. Eison, "Active Learning: Creating Excitement in the Classroom," ASHEERIC Higher Education Report No. 1, George Washington University, Washington, DC, 1991.

Brame, C., (2016). Active learning. Vanderbilt University Center for Teaching. <https://cft.vanderbilt.edu/guides-sub-pages/active-learning/>

Prince, M., "Does Active Learning Work? A Review of the Research," Journal of Engineering Education, Vol. 93, No. 3, 2004, pp. 223–231.

