**Here are 15 active learning techniques you could try in your classroom. There are many more. The overarching purpose is to provide opportunities in which students’ brains are engaged.**

**Technique 1: Clickers & Peer Instruction**

The teacher poses a question to his or her students. The students ponder the question silently and transmit their individual answers using the clickers. The teacher checks the histogram of student responses. If significant numbers of students choose the wrong answer, the teacher instructs the students to discuss the question with their neighbor. After a few minutes of discussion, the students submit their answers again. This technique often (but not always!) results in more students choosing the correct answer as a result of the peer instruction phase of the activity. This is a fairly simple way to use clickers to engage a large number of students in discussions about course material. This approach can also set the stage for a class-wide discussion that more fully engages all students.

More at:

<http://cwsei.ubc.ca/resources/clickers.htm>

<http://serc.carleton.edu/sp/library/classresponse/index.html>

<http://blogs.ubc.ca/eoassei/files/2017/01/EOS-SEITimes_10.01Clickers_2.pdf>

<http://cft.vanderbilt.edu/2013/04/using-peer-instruction-to-flip-your-classroom-highlights-from-eric-mazurs-recent-visit/>

**Technique 2: Exam/Homework Wrappers**

When graded exams are returned (as soon as possible after the exam was given), students complete an exam reflection sheet. They describe their study strategies, analyze the mistakes they made, and plan their study strategies for the next exam. These reflection sheets are returned to students before the next exam, so that they can make use of the ideas they had when the previous exam was still fresh in their minds.

Similarly, before beginning a homework assignment, students answer a brief set of self-assessment questions focusing on skills they should be monitoring. Students complete the homework as usual, and then answer a follow-up set of self-assessment questions. For example, for a homework assignment about vector arithmetic, a student may be asked (beforehand) "How quickly and easily can you solve problems that involve vector subtraction?" and (afterward) "Now that you have completed this homework, how quickly and easily can you solve problems that involve vector subtraction?"

More at:

<http://serc.carleton.edu/NAGTWorkshops/metacognition/teaching_metacognition.html>

<https://www.cmu.edu/teaching/designteach/teach/examwrappers/>

<https://serc.carleton.edu/details/files/31774.html>

**Technique 3: Just-in-Time-Teaching (related to “Flipping the classroom”)**

Just-in-Time Teaching focuses on improving student learning through the use of brief web-based questions (JiTT exercises) delivered before a class meeting. Students' responses to JiTT exercises are reviewed by the instructor a few hours before class and are used to develop classroom activities addressing learning gaps revealed in the JiTT responses. JiTT exercises allow instructors to quickly gather information about student understanding of course concepts immediately prior to a class meeting and tailor activities to meet students' actual learning needs.

More at: <https://serc.carleton.edu/sp/library/justintime/index.html>

<http://flexible.learning.ubc.ca/research-evidence/research-articles-2/flipped-classroom/>

**Technique 4: Worksheets w/small group work**

Worksheets provide opportunities for students to both learn and apply knowledge in a setting with peer and expert support. Worksheets contain problems or activities for students to do in class. The worksheet tasks are designed to align with learning goals, and to have students grapple with some key concept. Typically, students will work in small groups during a worksheet activity, although you may want them to try something on their own before talking with peers. As an instructor, you facilitate the activity and provide the full class with closure, typically with large-group discussion/mini-lecture after student input of ideas. Accountability for completing worksheets can be done with clickers, collecting worksheets, or peer marking.

More at:

<https://www.eoas.ubc.ca/research/cwsei/eossei-times/EOSSEITimes_5.7-Worksheets-prn.pdf>

<https://serc.carleton.edu/sp/library/lecture_tutorials/index.html>

**Technique 5: Jigsaw**

In a jigsaw, the class is divided into several teams, with each team preparing separate but related assignments. When all team members are prepared, the class is re-divided into mixed groups, with one member from each team in each group. Each person in the group teaches the rest of the group what they know, and the group then tackles an assignment together that pulls all of the pieces together to form the full picture, hence the name jigsaw.

More at: <https://serc.carleton.edu/sp/library/jigsaws/index.html>

**Technique 6: Two-Stage Exams/Reviews**

In a two-stage exam, students first complete and turn in the exam individually and then, working in small groups, answer the exam questions again. During the group part students receive immediate, targeted feedback on their solutions from their fellow students and see alternative approaches to the problems. This makes the exam itself a valuable learning experience while also sending a consistent message to the students as to the value of collaborative learning. Most students leave the exam with a good sense of how well they did and where they could do better. Using this technique for a review is effective at the start of a term, when there is pre-requisite knowledge expected, and also useful as practice for higher-stakes exams.

More at: <http://blogs.ubc.ca/eoassei/two-stage-exams/>

[www.cwsei.ubc.ca/resources/files/Two-stage\_Exams.pdf](http://www.cwsei.ubc.ca/resources/files/Two-stage_Exams.pdf)

**Technique 7: Gallery Walk**

Gallery Walk gets students out of their chairs and actively involves them in synthesizing important concepts, in consensus building, in writing, and in public speaking. In Gallery Walk teams rotate around the classroom, composing answers to questions as well as reflecting upon the answers given by other groups. Questions are posted on charts or just pieces of paper located in different parts of the classroom. Each chart or "station" has its own question that relates to an important class concept. The technique closes with an oral presentation or "report out" in which each group synthesizes comments to a particular question.

More at: <https://serc.carleton.edu/sp/library/gallerywalk/index.html>

**Technique 8: Think-Pair-Share**

Think-Pair-Share activities pose a question to students that they must consider alone and then discuss with a neighbor before settling on a final answer. This is a great way to motivate students and promote higher-level thinking. Even though the activity is called think-"PAIR"-share, this is the term many instructors use for pairs and small groups (three or four students) alike. Groups may be formed formally or informally. Often this group discussion "sharing" is followed up with a larger classroom discussion. Some think-pair-share activities are short, **"quick-response think-pair-share"** and sometimes the activities may be longer and more involved, **"extended think-pair-share."** The instructor can use the student responses as a basis for discussion, to motivate a lecture segment, and to obtain feedback about what students know or are thinking and it is easy to incorporate more than one think-pair-share activity in a given class period.

More at: <https://serc.carleton.edu/sp/library/interactive/tpshare.html>

**Technique 9: Muddiest Point**

The Muddiest Point is just about the simplest technique one can use. It is also remarkably efficient, since it provides a high information return for a very low investment of time and energy.

The technique consists of asking students to jot down a quick response to one question: "What was the muddiest point in \_\_\_\_\_\_\_\_?" The focus of the Muddiest Point assessment might be a lecture, a discussion, a homework assignment, a play, or a film. (Similar to One Minute Paper – where students write the response to a question within a minute).

More at:

<https://serc.carleton.edu/sp/library/interactive/oneminwrite.html>

**Technique 10: Group Work**

When students are grouped they have the opportunity to state their own views, to hear from others, and to hone their argumentative skills. It is important to keep the group size small to ensure that all students are engaged in the discussion. Groups usually report out their findings after the assigned time period for a certain task.

More at: <https://serc.carleton.edu/sp/library/demonstrations/groupwork.html>

<http://www.calstatela.edu/dept/chem/chem2/Active/>

**Technique 11: Debate**

Formal debates provide an efficient structure for class presentations when the subject matter easily divides into opposing views or ‘Pro’/‘Con’ considerations. Students are assigned to debate teams, given a 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 the 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).

More at: <https://serc.carleton.edu/sp/library/roleplaying/resource.html>

<http://www.calstatela.edu/dept/chem/chem2/Active/>

**Technique 12: Case Study**

Using case studies in class provides a robust opportunity to tie theory to real-world applications through the discussion, analysis and processing of actual cases from a given discipline. The case study approach is flexible and can be adapted for various disciplines and various levels of topic exploration. A case study can be a simple question posed to the class to generate a discussion about how the students would approach a given scenario. It can also be quite extensive, requiring background information and perhaps additional resources in order for the students to effectively dive in and approach the scenario. Case study methodology relies on realistic examples that are relevant to the course and future applications of the theory.

More at: <https://serc.carleton.edu/sp/library/cases/index.html>

<https://utah.instructure.com/courses/148446/pages/active-learning>

**Technique 13: Role Play**

In most role-playing exercises, each student takes the role of a person affected by an issue and studies the impacts of the issues on human life and/or the effects of human activities on the world around us from the perspective of that person. More rarely, students take on the roles of some phenomena, such as part of an ecosystem, to demonstrate the lesson in an interesting and immediate manner.

More at:

<https://serc.carleton.edu/sp/library/roleplaying/index.html>

<https://utah.instructure.com/courses/148446/pages/active-learning#role>

**Technique 14: Game based learning**

Game based learning uses competitive exercises, either pitting the students against each other or getting them to challenge themselves in order to motivate them to learn better. Games often have a fantasy element that engages players in a learning activity through a storyline. In order to create a truly educational game, the instructor needs to make sure that learning the material is essential to scoring and winning.
There are different categories that can be adapted for learning like [video games](http://serc.carleton.edu/introgeo/games/digigbl.html) (Digital Game-Based Learning) or board and Card Games.

More at:

<https://serc.carleton.edu/sp/library/games/index.html>

**Technique 15: Interactive Simulations**

Interactive simulations are computer-based activities in which students can manipulate some kind of virtual system. Good interactive simulations are designed to help people visualize processes that are otherwise hard to visualize. The controls are designed so that exploration of concepts is easy and encouraged. They include multiple representations of the same concept to help build more complete mental models.

The PhET group at the University of Colorado is the leader in tested, interactive educational simulations for science and math: <https://phet.colorado.edu/>