Pedagogy
VIDEO SERIES

Active Learning

What is it?

Over the past decade, the words “active learning” have been uttered more and more frequently within higher learning institutions. However, many do not quite understand what exactly active learning entails, and more importantly what benefits it brings to the learning process. Our hope is that this resource will provide some clarity on the matter.

Active learning isn't a new idea. In fact, primary school education provides a relatively good example of Active Learning in motion, demonstrating how a more social and active learning environment, or process, promotes a deeper level of learning. Supporting this, Bonwell and Eison (1991) state that active learning entails involving students in doing things, and thinking about the things they are doing. Put simply, active learning is any activity where a student must think, create, or solve a problem (Centre for Instructional Technology, Duke University, 2016).

It seems however, that many higher learning institutions, have forgotten that learning is naturally an active process, that requires much more than students simply sitting back and passively soaking up a professor’s lecture. Active learning instead requires placing students in situations that engage them in active processing in order to absorb and retain knowledge.

Why use it?: The Benefits

Active learning techniques are teaching methods that allow the student to mentally and/or physically engage with the material. This engagement allows the learner to better process the information, thus creating a longer-lasting memory trace, improving content knowledge, critical thinking, and problem solving abilities (Anderson, Mitchell, & Osgood, 2005; see also Kember & Lung, 2005). Active learning also provides an opportunity for the professor, as well as the student, to determine what has been learnt, where there are gaps in the learning, as well as identify weaknesses. This can help target the learning activities more appropriately and effectively.

According to Wilke (2003), active learning promotes higher level learning because it:

- Advances the view that learning is a process and not a set of facts to memorize.
- Promotes a belief in the student’s own ability to learn about the subject (self-efficacy).
- Shifts the responsibility of learning away from the instructor and onto the student.
- Gives more value to the learning experience because the learner has done the work rather than being given the answer.

According to Svinicki (2001), there are 10 benefits to implementing active learning principles, some of which overlap with those we have already mentioned above. [1]

1. Students are more likely to access their own prior knowledge, which is a key to learning.
2. Students are more likely to find personally meaningful solutions or interpretations.
3. Students receive more frequent and more immediate feedback.
4. The need to produce forces learners to retrieve information from memory rather than simply recognize a correct statement.
5. Students increase their self-confidence and self-reliance.
6. For most learners, it is more motivating to be active than passive.
7. Tasks that you have done yourself, or as part of a group, tend to be more highly valued.
8. Student conceptions of knowledge change, which in turn has implications for cognitive development.
9. Students who work together on active learning tasks learn to work with other people of different backgrounds.
10. Students learn strategies for learning itself by observing others.

Putting it into Practice

What are some key practices that one could consider when trying to incorporate Active Learning into their teaching practice?[2]

In order to enhance learning of material, professors should:

1. Help students recognize that the information is related to something they already know.

A. For instance, one could have students keep a journal addressing the following questions:
   i. How does this material relate to my everyday world?
   ii. How does this material relate to my major/chosen profession?

B. Draw analogies, or have students draw analogies, between the material and the everyday world.
C. Use concept mapping.
D. Construct your lessons to draw on material previously presented.
E. Remind students that your lessons draw on previous information.
F. Revisit previous material briefly, or have student recall previous material through targeted questions, when introducing a related topic.

2. Provide the students with multiple contacts with the new information.

A. Coordinate labs and lecture activities to ensure that information in one is revisited in the other.
B. Present assignments in a manner which allows the students to revisit material several times during the semester.
C. Never mention a topic just once.
D. Give students feedback during or after practice sessions (i.e.: lab work).

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[1] List is reproduced from College Teaching Methodology with the permission of Dr. Marilla D. Svinicki, Professor Emeritus, University of Texas Austin.

[2] Portions of this text are adapted from *New Faculty Resource Guide: Active Learning Overview with permissions from Virginia Commonwealth University - Centre for Teaching Excellence.*

3. **Attach new information to what they already know.**
   A. Use concept mapping.
   B. Give students problems to solve using both new and old information.

4. **Help students reflect on their learning.**
   A. Use journaling as detailed above under point 1.
   B. Have students interact with others.
      i. Create small groups of students and have them make a decision or answer a thought-provoking question periodically.
      ii. Write their answer to your thought-provoking question first and then discuss it with classmates.
      iii. Create real-life problems for students to solve in groups.

5. **Help students see the benefit of the material.**
   A. Find ways of helping students observe (directly or vicariously) the material they are learning. For example, after describing a theory, a professor in chemistry performs a laboratory demonstration.
   B. Find ways to allow students to actually do (directly, or vicariously with case studies, simulation or role play) that which they need to do, in order to learn.
   C. Create real-life problems for students to solve in groups.
   D. Use journaling as mentioned above.

Exercise: Reflecting on Active Learning Teaching Strategies

How are you currently teaching and how might you incorporate more active learning? Complete the Active learning teaching strategy list to see!

What are some Teaching Strategies that engage Active Learning principles?

1. **Think-Pair-Share Activities:** This entails having a student work alone on something, then pair with at least one other student, before sharing with the group at large.

2. **Polling/Voting:** Consider incorporating polling or voting within your class. This can be done in electronic form, or just by using a show of hands or different colored cards. This is a great tool because it allows all students to contribute, and is a great way to see what students have understood or think about a particular topic.
3. **One Minute Paper:** Use the one-minute paper to obtain feedback from your students regarding what they've understood, or what they want to know more about. It's particularly useful at the start of a class to determine what students already know about the topic, in order to avoid covering material that they are already familiar with. It's a great tool to guide your teaching.

To learn more about teaching strategies that focus on engaging Active Learning principles, consult:

The University of Waterloo's Centre for Teaching Excellence web-page on the topic:

University of Waterloo Active Learning Activities

Dr. Jim Eison's (2010) article on the topic:

Using Active Learning Instructional Strategies

Some Limitations – Things to Consider

According to Svinicki (2001) there are 10 key things that you should consider when implementing active learning strategies within your teaching.[3]

1. Make sure to identify the real objectives of learning (e.g. the why or how, not just the what).
2. Understand the process of how students are learning (e.g. the solving, not just the solution).
3. Be patient and react to what is said, not who said it.
4. Think on your feet so you can turn any outcome into a learning opportunity.
5. Be willing to entertain alternative solution paths or explanations in case the students go in a different, but reasonable direction.
6. Act as a facilitator of learning, rather than a deliverer of content.
7. Have a deep understanding of the content and how a student might go about learning it.
8. Accept less breadth in the interest of greater depth of understanding.
9. Alter the testing procedures to reflect what was done in the active learning format.
10. Be able to accept when it doesn't work the first time and keep on trying.

How do I integrate multimedia?

There is an abundance of technological tools that can promote active learning. For example, a learning management system (LMS; like BlackBoard Learn) contains various tools that can serve as a starting point when designing an activity (e.g. a quiz, discussion forums, wikis). These activities can offer a gradual increase in the level of complexity or difficulty, and can be presented at a specific time, or as a series of steps.

Technological tools that are available outside of an LMS (e.g. Socrative, FluidSurvey, WordPress, GoodleDocs, etc.) can also be used to develop online activities, but may not always offer the ability to save a student's work/contribution. Therefore, if you intend to review or record the activities or student participation, external tools may not always be as useful or reliable as those found in an LMS. Here we mention a few tools that are either already widely used within university settings, or which are supported and therefore offered free of charge by the Teaching and Learning Support Services of the University of Ottawa.

[3] List is reproduced from College Teaching Methodology with the permission of Dr. Marilla D. Svinicki, Professor Emeritus, University of Texas Austin.

Lecture Tools

- Want to get your students immersed in the material?
- Want to be able to incorporate questions into the lecture, and give each student the ability to pose questions during a class?
- Want to give your students the ability to let you know when they are confused, or when they need to know more about something, while in class?
- **LectureTools** may be the answer that you are looking for.

For additional information on Lecture Tools, please visit the Echo 360 Lecture Tools web-site. Alternatively, to try out any of the Echo 360 Active Learning Platform tools, please visit the Centre for Innovative Technologies in Education web-site, and request the creation of an Echo360 account, and/or a demonstration.

Online Polling/Voting System

- Want to know what your students already know about a topic?
- Want to know what your students have learnt during a class?
- Want to test your students on the fly?
- Want to be able to share information with your students in class as well as after class?
- Have less than 50 students in your class, or support that students use the tool in groups?
- Then consider using **Socrative**!

Want to try out Socrative?

Then visit Socrative.com and create your FREE account to start engaging your students! Also, consider creating a student account, so that you can see how things look on the student side of things.

Am I doing it right?

How do you select the appropriate tool and/or activity and what needs to be considered when creating an activity? Use the following as a preliminary guide.

The questions outlined below can help you think about the learning outcome of an activity, the most appropriate technology for building it and how students will receive feedback and be assessed on their learning and work.

Activities can be relatively straightforward tasks that an individual can complete in a short amount of time, or more complex activities that can include collaboration between students, and have a longer timeframe. All activities should promote meaningful engagement with course concepts and not become "busy work" for the students.

Consider the following questions [4]:

1. **What is the intended learning outcome of this activity?**
    - Most course outlines or syllabi have a set of course objectives/ intended learning outcomes; use these same principles to articulate one specific intended learning outcome for the activity.

[4] Adapted from Developing online learning activities for blended courses with permission from the University of Waterloo - Centre of Teaching Excellence.

2. **How long should the learning take?**
   - This will depend on the intended learning outcome of the activity. The interaction and learning time can be short, for example a 5-minute self-assessment for students to monitor their understanding of a concept, or longer, such as a series of practice problems that are linked to a Java applet or web-based interactive simulations that could take up to an hour.

3. **Will the activity be individual, collaborative or both?**
   - Depending on the objective of the activity, it may be more beneficial for the student to work alone, or reflect first before sharing with others in a group. Active learning strategies often benefit from group work. Remember two or three heads can be better than one! Peer-to-peer interactions and dialogue about challenging concepts and problem solving can increase engagement and help learning, so it can be helpful to design activities with this in mind, and to encourage students to collaborate on such activities.

4. **Which media and technologies should be used?**
   - Keep it simple. The overwhelming range of tools and media options available can make it challenging to choose how to best design and deliver an activity. Use the objective or intended learning outcome of the activity as a starting point to decide which visual and audio components will be most effective.

5. **How will the learners get feedback on what they have learned?**
   - "Close the loop" of learning by providing feedback to the activity. Effective feedback can direct and guide a student and help them understand if they have achieved understanding.

6. **How will the learning be assessed?**
   - We typically provide summative assessment to students by grading them on tasks, and their grade or mark reflects how well they have performed on the task. On the other hand, Formative assessment can help students recognize misconceptions and guide them to better understanding and thus better performance on future assessments. Both formative and summative assessment can be part of a learning activity depending on the objective or intended learning outcome.

7. **How will I motivate students to participate in the activity?**
   - If an activity is perceived as valuable to students and properly integrated into a course, students will be more motivated to do the activity. Participation marks or a small grade allocation for engaging in an online learning activity can also increase students' motivation. Students are more likely to participate in low stakes activities if they are going to be integrated into their experiences in the classroom, for example: tutorials or labs. Providing real world, authentic tasks that are relevant to students' lives or future professional lives that are challenging, but achievable, can also increase motivation.

8. **How will communication: Student-to-student and student-to-professor occur?**
   - It is wise to offer students the opportunity to pose questions either while in class, or online via a « Frequently asked questions » discussion forum. This will help promote a positive learning environment.

Exercise: Putting things into practice

Want to make sure that you are employing the active principles correctly? Check out the following guidelines for creating in-class activities as well as the checklist.

Principles and Practical Tips for Creating in-Class Activities

Active Learning Checklist

Want to know more?

A. Check out the following document produced by Dr. Jim Eison (2010) which details: supporting research in the area, common obstacles reported by faculty members, as well as a number of teaching strategies that focus on engaging Active Learning principles.

Using Active Learning Instructional Strategies

B. In addition, you might find the professional development resource produced by the Texas Collaborative for Teaching Excellence useful. It also details some research in the area, strategies to engage in Active Learning, along with some common roadblocks to students' participation.

Professional Development Module on Active Learning

C. Wondering how students will react? Want to know how you can help students make the shift from Passive to Active Learning? Take a look at Dr. Marilla Svinicki's paper by visiting:

Essays on Teaching Excellence

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