

Active Learning

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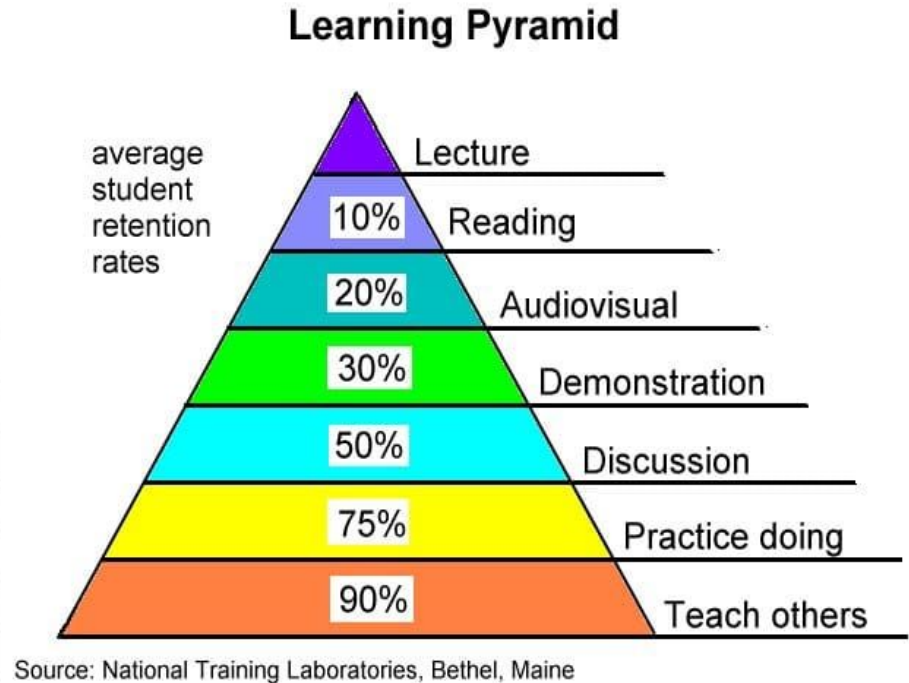
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Learning Outcomes

1. Define what is active learning.
2. Explain the importances of active learning in teaching and learning.
3. Describe at least 3 active learning strategies.

- Instructional activities involving students in doing things and thinking about what they are doing. (Bonwell & Eison, 1991)
- Students are engaged in their own learning. (Handelsman et al., 2007)
- Engages students in the process of learning through activities and/or discussion, rather than just listening passively. It emphasizes the higher order thinking and often involves group work. (Freeman et al., 2014)
- Students' effort to actively construct their knowledge. (Carr et al., 2015)

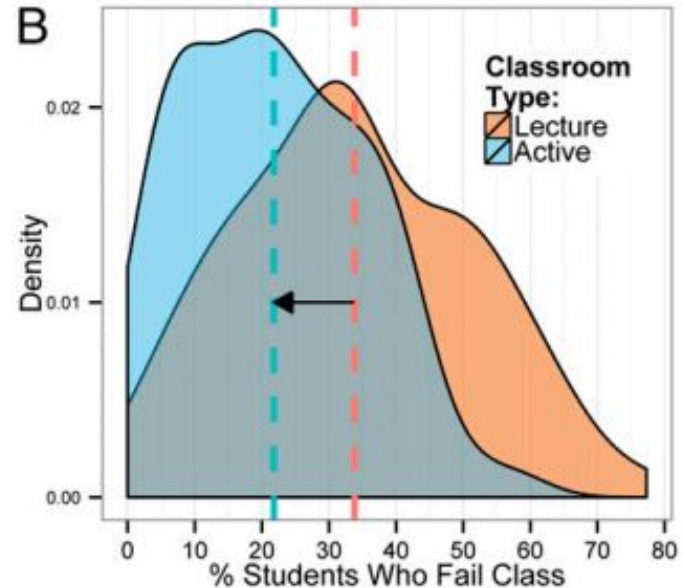
- Most students only remember about 10% of what they read from textbooks, but retain nearly 90% of what they learn through teaching others.
- Some methods of study are more effective than others and that varying study methods will lead to deeper learning and longer-term retention.



Undergraduate students in classes with traditional stand-and-deliver lectures are **1.5 times more likely to fail** than students in classes that use more stimulating, so-called active learning methods.”

55 percent more students fail lecture-based courses than classes with at least some active learning.

(Freeman et al, 2014).



Source: Freeman et al, PNAS.

As more brain areas are activated, there are a higher number of cortical modules the hippocampi have to connect. This, in turn, makes memories more deeply embedded in the brain, and more easily retrievable.

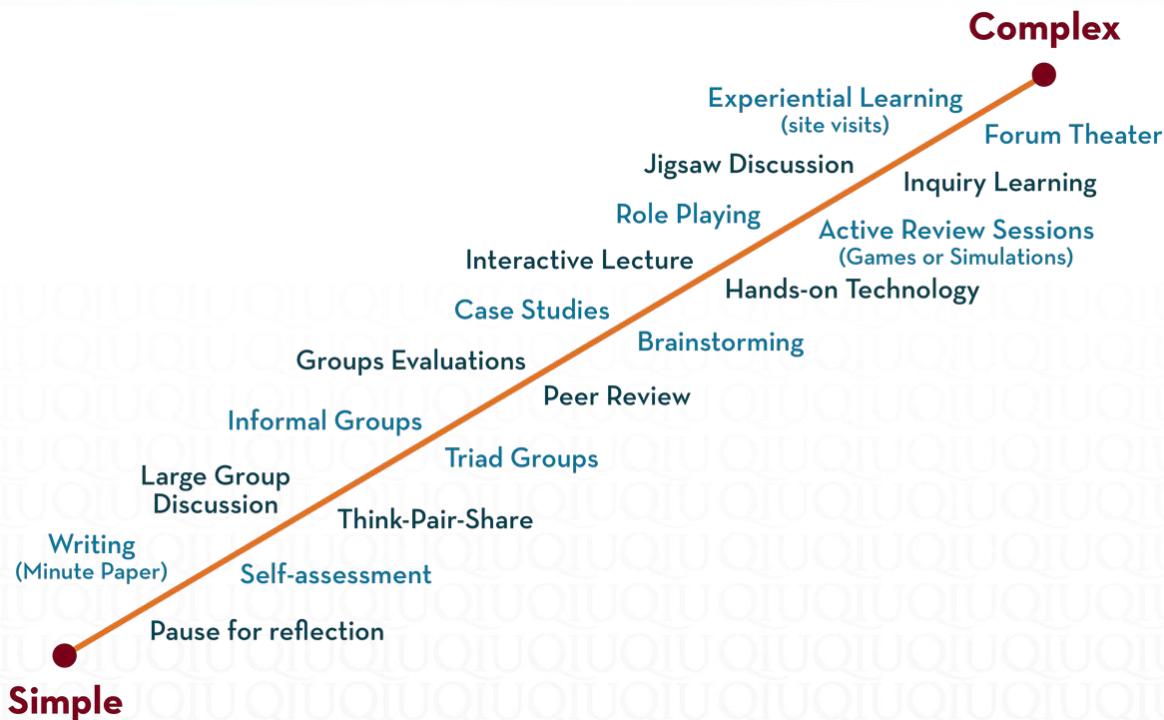


Source: Image generated with ChatGPT

Why is Active Learning Important?



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Source: [G. Cain](#) (2024)

Form a “Home Group”

- Each student of the group to specialise in one aspect of a learning unit.

Meeting Specialists

- Students meet with members from other groups who are assigned in the same aspect.
- After mastering the material, they return to the “home” group and teach the material to their group members.

Cooperative Learning Strategy



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T (think)

Students “think” about what they know or have learned and come up with their own individual answer.

(1-3 minutes)



P (pair)

Each student is paired with another student. They share their thinking with each other and proceed with the task.

(5-10 minutes)

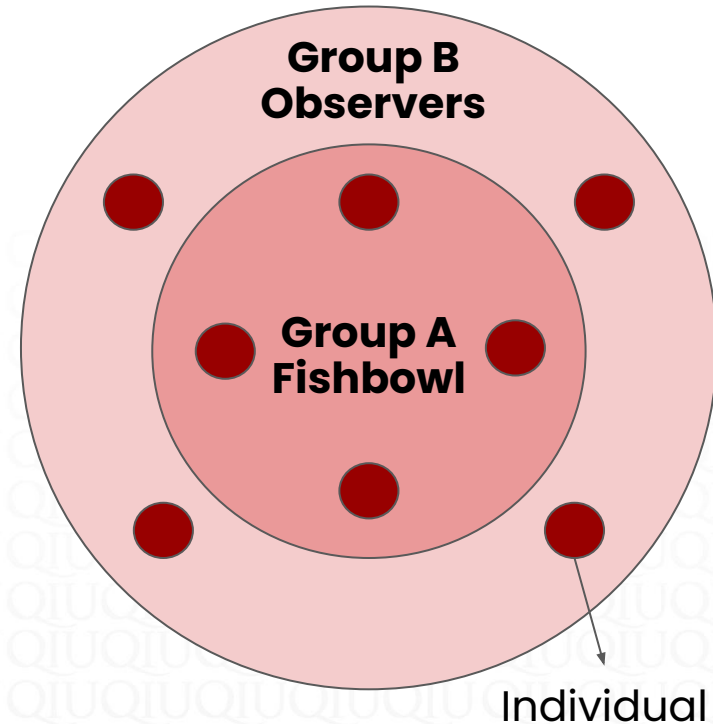


S (share)

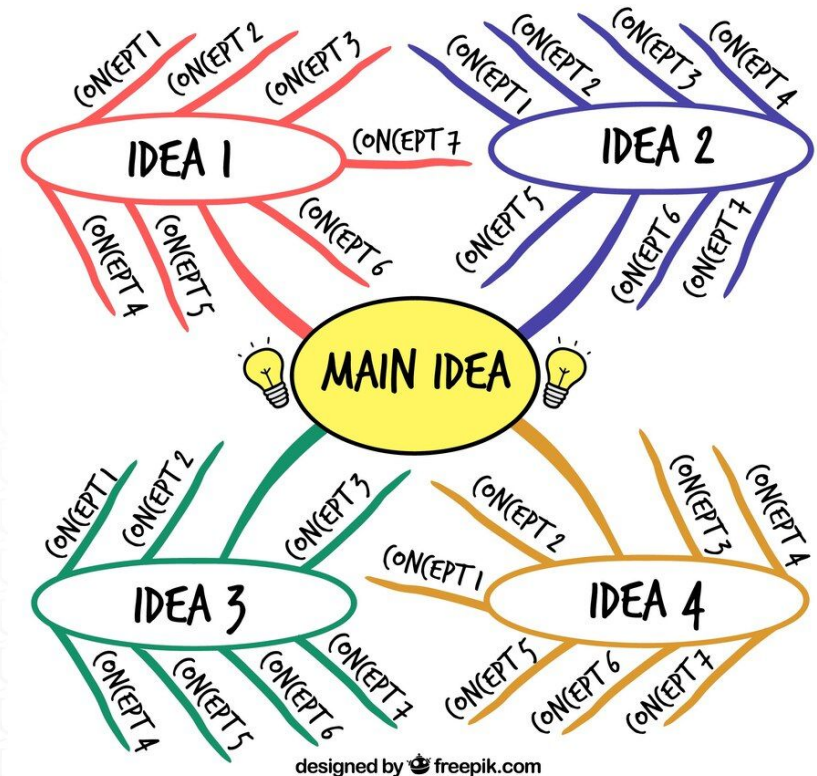
Students share their thinking (or solution) with the entire class.

(3-5 minutes)

- Students seated inside the “fishbowl” actively participate in a discussion by asking questions and sharing their opinions, while students standing outside listen carefully to the ideas presented.
- Students take turns in these roles, so that they practise being both contributors and listeners in a group discussion.



- Students work in a small group to create a mind-map:
- Create visual representations of models, ideas and the relationships between concepts.
- Identify and organise information and to establish meaningful relationships between the pieces of information.



- The 6 Thinking Hats was written by Dr. Edward de Bono.
- It is a tool to boost the productivity of creative thinking by dividing up the different styles of thinking into six "hats".

The six thinking hats

 The white hat Data, facts & information What we know, and what we ought to find out	 The yellow hat Sunshine & positivity Optimism, possibilities, upsides, potential
 The red hat Feelings, reactions + vibes How we feel: gut instincts honest emotions, intuition	 The blue hat Manages the process Listens, directs attention, integrates, moves forward
 The green hat Creativity & surprise Alternatives, reframing, out-of-the-box ideas, what-ifs	 The black hat Caution & skepticism Dangers, threats, risks, drawbacks, worst-case scenarios

A concept by Edward de Bono, 1985.

BiteSize Learning

Bonwell, C. C., and Eison, J.A. (1991). *Active learning: creating excitement in the classroom*. ASH-ERIC Higher Education Report No. 1, Washington, D.C.: The George Washington University, School of Education and Human Development.

Carr, R., Palmer, S., and Hagel, P. (2015). *Active learning: the importance of developing a comprehensive measure*. *Active Learning in Higher Education* 16, 173-186.

Freeman, S. et al. (2014). *Active Learning Increases Student Performance in Science, Engineering, and Mathematics*. *PNAS*, 111, 8410-8415. <https://doi.org/10.1073/pnas.1319030111>

Handelsman, J., Miller, S., and Pfund, C. (2007). *Scientific teaching*. New York: W.H. Freeman.

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