

Microlessons and Active Learning

TA Professional Development Workshop

Mount Allison University

5 Feb 2020

Dr. Erin Meger



Who am I?

- PhD in Mathematics, Ryerson University
- OER Fellow with OpenEd Group
- Instructor for Math and CS, Wilfrid Laurier University
- Teaching Assistant 2010-2019
- High School Math Specialty Teacher 2015-2018

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Post-Doctoral Fellow with Dr. Messinger

What are we doing today?

MicroLessons

Short lessons lasting only a few minutes focusing on one specific topic

Active Learning

Engaging students through interactive learning components, teaching style, and more!

Learning Outcomes

- Identify principles of active learning and apply them during your teaching
- Create and present microlessons using
- Identify examples of active learning

Course Agreement

The goal of this course is to offer a meaningful, rigorous, and rewarding experience to every student; you will build that rich experience by devoting your strongest available effort to the class.

You will be challenged and supported.

Please be prepared to take an active, patient, and generous role in your own learning and that of your classmates. (c/o Federico Ardila)

Activity 1: Good Teaching Examples

Take a moment to think about a time where you really enjoyed learning from someone. This could be a teacher, tutor, TA, or friend. Think about the following questions:

1. How much of the material do you still remember today?
2. What is something specific they did that helped your learning?
3. Do you think they could have done better in any way?

What is Active Learning?

“Thus **active learning** is commonly defined as activities that students do to construct knowledge and understanding.

The activities vary but require students to do **higher order thinking.**”

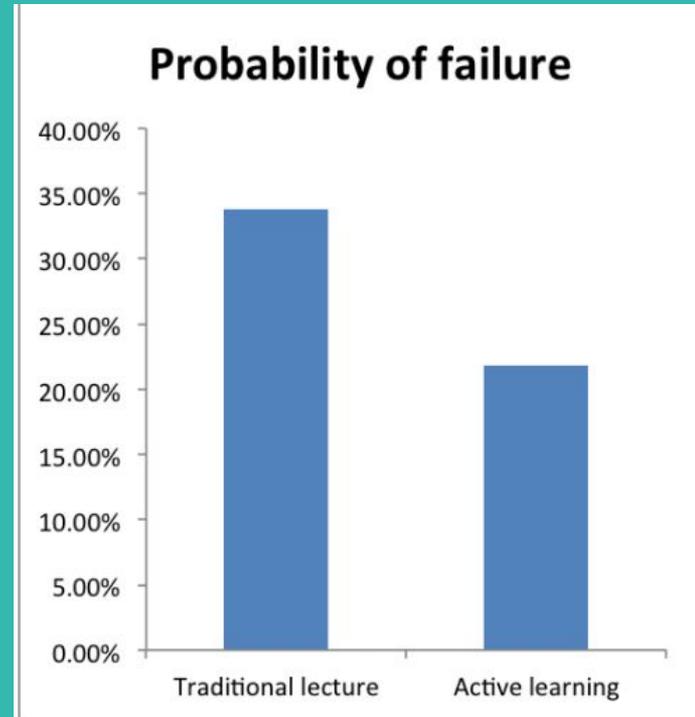
Dr. C. J. Brame, PhD,
CFT Assistant Director
Vanderbilt University

The focus is on student engagement. How can we get students to actively participate within the learning process?

Active Learning Works

They found that students in traditional lectures were 1.5 times more likely to fail than students in courses with active learning

On average, student performance on exams, concept inventories, or other assessments increased by about half a standard deviation when some active learning was included in course design



Freeman, S., Eddy, S.L., McDonough, M., Smith, M.K., Okoroafor, N., Jordt, H., and Wenderoth, M.P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences*.

Bloom's Taxonomy

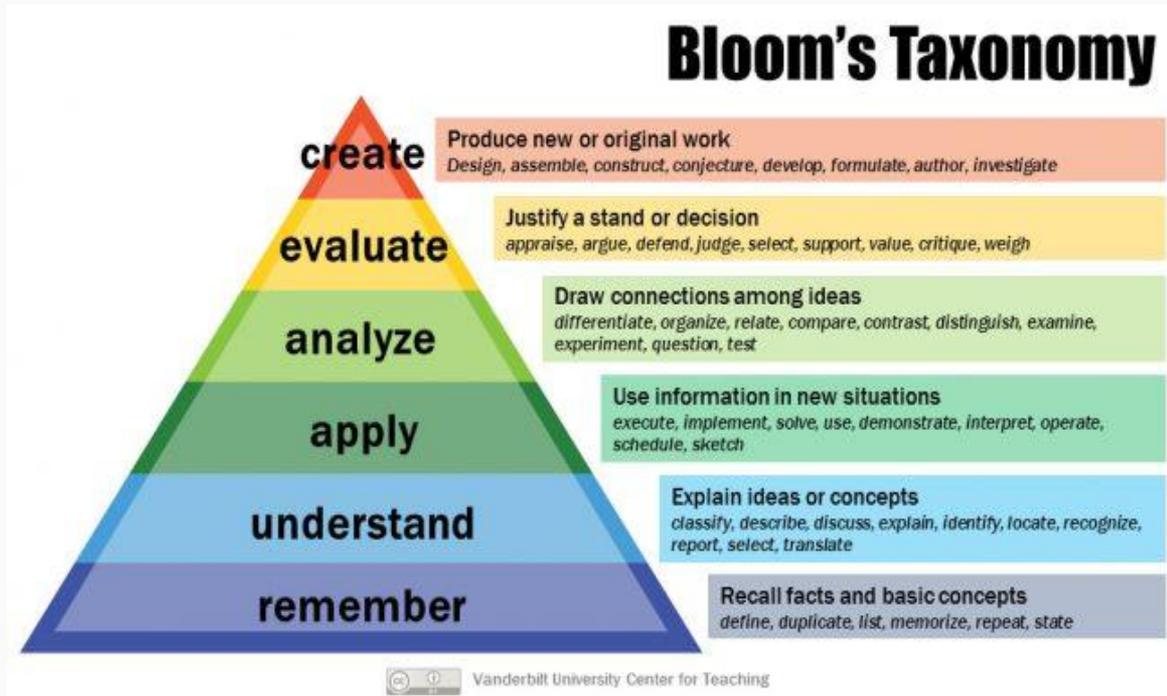
Encourage all levels of thinking and learning.

Build foundations before extending learning.

Use action words when asking questions that reflect the level you want students to achieve.

Remember: Simple questions are not bad questions

Patricia Armstrong ["Bloom's Taxonomy"](#) Center for Teaching, Vanderbilt University.



Activity 2: Who are you?

Turn to your neighbour and introduce yourself!

- Name
- Program and year of study
- How long have you been a TA, and what have you TA'd?
- Favourite course to TA and why!

Teaching Principles:

- Set clear expectations for learning and participating
- Encourage critical thinking, and nurture the learning process
- Create positive spaces that are inclusive to people
- Ask good questions when you can
- Reflect on your teaching, and think about how you can do better

Bloom's Taxonomy

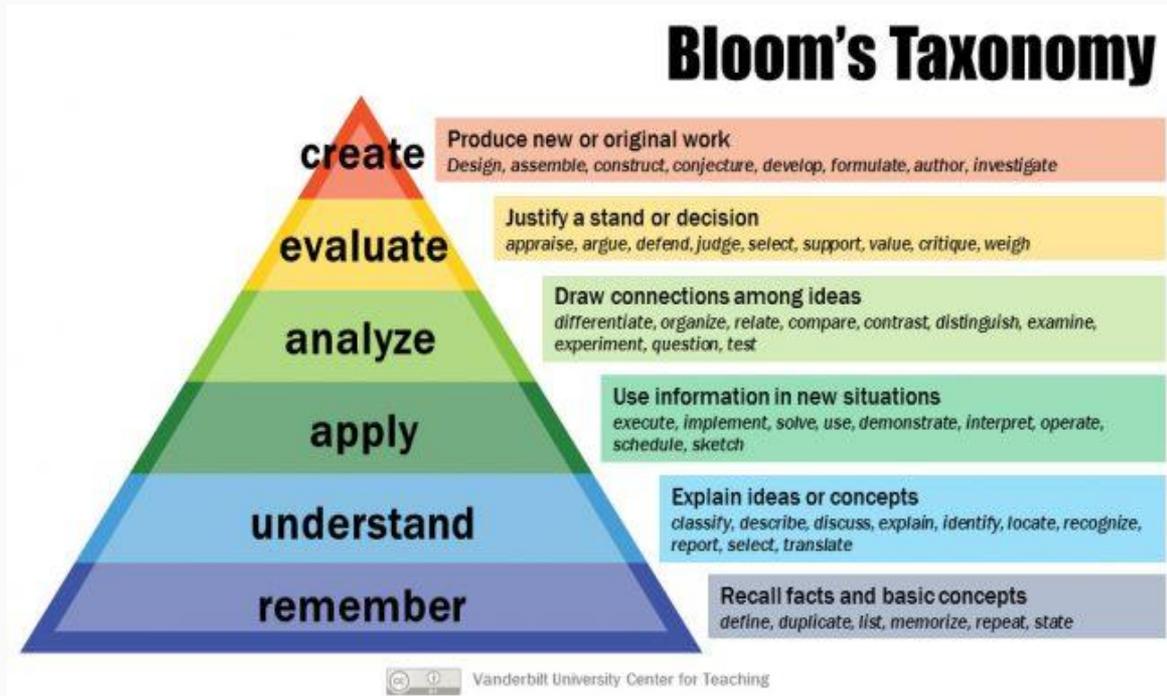
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Activity 3: Goals!

Gather into a group of 2-3

- Discuss the goals you have for this workshop:
[Questions to Consider] How do you already use Active Learning in your teaching? How could you use it better? What is one area you would like to improve?
- On a piece of paper (individually or together):
Write down your specific goals for today. Wad up the paper, and throw it to the front of the room

Good Question!

- All questions are good questions
- If you think a question is bad, consider what is at the root of the question and what answer they are looking for, it could just be poorly worded
- Some questions encourage critical thought (higher order), and some evaluate knowledge (lower order)
- Questions asked by students also fall into these two types

Break

See you in 5 minutes.

Mircolessons

Microlessons are small lessons that you can plan in advance for any tutorial, lab, or class.

These lessons focus on exactly one topic at a time, and provide bite-size pieces of information.

Usually they are used when students need extra exposure to a particular topic or in peer-to-peer teaching

Focus on fully explaining one small example or type of math problem in a way that encompasses all the necessary information.

Microlessons

Tip

Think about a microlesson as a way to explain one specific type of question

Discussion

How can you incorporate microlessons into your own tutorials?

Framework for Math Problems

- Solve the problem for yourself
- Write out on the side all the steps you took
- Find the **big picture** (tool, concept, trick, etc)
- Now, write it down in reverse: what are we learning, how do we do it, and give the example

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Let's try it together!

Activity 4a: Micro-Teaching Part 1

- Pick one of the questions on your lab, and work out the solution
- Write out the steps you took on the side
- What is the **big picture** of the question?

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Write out a microlesson for this problem on the cue card

Activity 4b: Micro-Teaching Part 2

- Find a group with 4-5 others such that each student completed a distinct question
- Take turns giving each other your lesson
- Provide **effective** feedback after each lesson

Giving Effective Feedback

Tip

Avoid words like always or never

Tip

Include action words such as: speak, include, demonstrate

Examples

Speak louder; demonstrate the technique; use more steps; etc.

- Pick something positive to draw attention to
- Find an area where they could improve, and give the comment in a way that **highlights growth**, and be specific
- End by acknowledging a way their hard work was effective

Waimei Amy Tai. [“How to Give Feedback They’ll Hear”](#) Stanford Teaching Commons, 2014.

[“Guidelines for Effective Feedback”](#) Stanford University.

Activity 5: Active Learning

Part 1:

- Pick a topic from the lab you have in front of you
- Create a new question that has the same method of solving

Part 2:

- In pairs, take turns working through the solution and asking good questions.
- A delegate from each pair can come to the board to write their question and solution

Active Learning Examples

1. Think Pair Share
2. Group Work
3. Reflection Writing
4. Throwing and Movement
5. Peer-to-Peer instruction
6. Building raport
7. Peer evaluations

What other examples can you think of?

Thank you!