Active Learning and Diversity in the Classroom

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Learning objectives

By the end of this session, you should be able to:

1. Describe active learning
2. Give some examples of active learning activities
3. Explain the benefit of active learning approach vs. traditional lecture approach
4. Learn how to create a more inclusive environment in the classroom
5. Incorporate active learning and diversity considerations into your TA/PLA activities
What Is Active Learning?

Think – Pair – Share Exercise

1. Think: Individually, write down 3 words that you think best describe Active Learning
2. Pair up with a few neighbors and discuss ideas
3. Share your words and come to a single list of three for your group
What Is Active Learning?

“Active Learning implies that students are engaged in their own learning. Active teaching strategies have students do something other than taking notes or follow directions, placing the responsibility for learning squarely on their shoulders. As they participate in activities that involve group learning, problem solving, or inquiry-based learning, students construct new knowledge and build new scientific skills.”

Definition from “Scientific Teaching”, J. Handelsman, S. Miller, C. Pfund
Active Learning Activities:
HOW do we incorporate active learning in the classroom?

Brainstorming Exercise
Active Learning Activities

• Brainstorming
• Think-Pair-Share
• One minute question
• Concept map
• Strip sequence
• Clicker questions
• Case/problem solving
• Group work
• Lab activities
Benefit of Active Learning
Increase of student performance

Students learn more when they are actively engaged

Benefit of Active Learning
Decrease of student failure

Freeman et al., 2014. Active learning increases student performance in science, engineering and mathematics. PNAS 111(23):8410-8415.
Central Dogma
Reading Exercise

“The DNA in genomes does not direct protein synthesis itself, but instead uses RNA as an intermediary. When the cell needs a particular protein, the nucleotide sequence of the long DNA molecule is first copied into RNA (Transcription). These RNA molecules are used directly as templates to direct the synthesis of the protein (Translation). The flow of genetic information in cells is therefore from DNA to RNA to protein. All cells, from bacteria to humans, express their genetic information in this way—a principle so fundamental that it is termed the central dogma of molecular biology.”

Definition adapted from “Molecular Biology of The Cell”, 5th edition
Central Dogma

Concept Map Exercise

1. A vocabulary list, sticky notes and paper are provided for each group

2. Use the sticky notes to create a “visual map” on a piece of paper that shows the relationship between the terms. Label lines/arrows linking terms to define connections

3. Try and use all of the terms provided on your vocabulary list!
FOR A FAIR SELECTION
EVERYBODY HAS TO TAKE
THE SAME EXAM: PLEASE
CLIMB THAT TREE
What Is Diversity?

Human diversity refers to the variation of human experience, ability, and characteristics.

Diversity should be considered in teaching because:

1. Education should be accessible to all students
2. Diversity enhances learning
3. Each student will experience the classroom differently from everyone else in the class.

Definition adapted from “Scientific Teaching”, J. Handelsman, S. Miller, C. Pfund
Diversity

Examples

- Gender
- Race (ethnic minorities, international students...)
- Physical disability
- Scientific and cultural background
- Learning styles
Diversity
Case study

1. Read the handout case study

2. Discuss with your group how the professor can create a more inclusive environment in the classroom

3. Discuss what a TA/PLA could do to help create a more inclusive environment in such situation

4. Report to the whole group
Professor
“I use active learning all the time in my class. Every minute or two, I ask questions. I think it makes me seem friendly and open to hearing students’ ideas. I try to call on students randomly to make sure everyone is engaged, but I often end up asking the best students so they can set the standard for the rest of the class.”

Student A “The professor is just so engaging in class. I feel like I have a connection with her, and I want to be prepared for every class so I can answer the questions she asks. Sometimes, she asks a question, and I answer it, and then we have a great dialogue in front of the whole class about something more advanced than what is in the syllabus or reading. I am learning so much!”

Student B “This class scares me death! The professor constantly asks questions, and I am terrified that she will ask me something I don’t know the answer to. I don’t like to speak in public, and never had to in my homeland. I feel that I should sit at the front out of respect, but I aim for the far right to hopefully be out of her line of sight. I can’t wait for the semester to end so I can get rid of this stress.”

Student C “I have no clue what is going on in class. The prof asks lots of questions, but I usually have no idea what the answer is. I must be really stupid because the kids in the front row know it all already. The prof keeps on calling on them. It’s like they are in the same club or something. Hell, they even look alike! Anyway, I hide in the back so she won’t call on me or I just skip lecture. She should tell us what she wants.”
Active Learning In Action

• Active Learning is great, but how does it affect my duties as a TA/PLA?
• Each group will suggest 2-3 ways that active learning (and considerations for diversity!) could help you transform the assigned scenario into a better learning experience for your students
Common PLA responsibilities:
Facilitating Group Work

Your instructor may ask you to:
“Walk around and help the groups”

What does that mean?
How can I help? What do I say?
Facilitating in-class group work

- Obtain and review the activity prior to class if possible
- Pay attention as the activity is explained to the class
- Circulate: look and listen
  - Are groups not talking and/or working independently?
  - Are groups looking confused?
  - Are groups off-topic (and/or web surfing)?
  - Is anyone dominating or withdrawing from the group?
- Intervene with troubled groups when you feel you could help
  - How are you doing over here? Do you have any questions? What have you come up with so far? What do you think, Joe?
- Don’t give away the answer! Redirect as necessary
- Report problems to the instructor
REAL-WORLD SCENARIOS: FACILITATING GROUP WORK

For each scenario that your group is assigned, discuss:

1) What are the problems that this group is encountering?

2) What should the TA/PLA do?

Identify one person to report out to the whole group.
Facilitating group work: Summary

• Try to prepare for the activities if possible
• Circulate: look and listen
• Have a few ice breakers up your sleeve
• Know when to intervene
• Ask leading questions but avoid giving away the answers
• Report problems to the instructor