Academic Excellence Workshop Series:
Examples of Teaching Practices

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“Innovative Teaching Strategies” Examples  

Dr. Ero-Tolliver’s Classrooms  
Hampton University
Innovative Teaching Strategies?

*White Chart Activity*

*(5 minute activity)*

- What is teaching innovation?
- What does it look like when implemented?

**THINK-PAIR-SHARE**

- Challenges
- Expectations
- Benefits
BLUE BAG ACTIVITY
(10 minutes)
Utopia or Wakanda of a Classroom

• Using the resources provided, create a mobile that includes the tenants of what you think an inclusive classroom with innovative teaching would contain?
REALITY BAGS (need more equity in education)

http://www.powerhousemt.org/discussion-equity-equality/
“YOUR” Reflections
Design your activity (5 minute activity)

Before

• Think of a classroom lesson you would like to teach
• What innovative teaching strategies do you currently do?
• What innovative teaching strategies would you like to incorporate?
“Education should not be the filling of a pail, but the lighting of a fire” - William Butler Yeats

https://www.freepik.com/free-photos-vectors/torch
Teaching Philosophy

• Teaching statement
  – Facilitator of knowledge for my students instead of the being the sole source of knowledge

• Teaching
  – Majors and non-majors
  – Diverse population of learners/learning styles
    • sometimes use tactile, verbal and/or visual cues for learning
Misconceptions and Pre-Existing Knowledge

• Be aware of knowledge level of students. The knowledge (and misunderstandings) they bring with them into the class will shape what they learn in the class.
Technology Usage: Online Homework Assignment

- Created by instructor on Blackboard
- Submitted by student on Blackboard
- Grading by instructor on Blackboard
Supplemental Online-Video Lectures

• Provide online resources for students and attach links to other lectures that reiterate the concepts have been taught in class.
  – Eg. Using Vincent Racaniello’s virology lectures as a supplement for mine to make ideas more salient.

https://www.youtube.com/watch?v=210dHOdmJVI
ACTIVE LEARNING
ACTIVE LEARNING Benefits

Approaches that promote active learning focus more on developing students’ skills than on transmitting information and require

- that students do something—read, discuss, write—that requires higher-order thinking.

They also tend to place some emphasis on students’ explorations of their own attitudes and values—Brame, C., 2016.
ACTIVE LEARNING

• Make thinking visible.
  – Student thinking: Have students engage in activities that make visible the processes of their thinking, rather than merely the conclusions of their thinking.
  – Expert thinking: Model expert thinking, being careful to make explicit the strategies and techniques that are implicit in expert thinking.
Case Studies
Case Study Resources
Case Studies

- What do you want students to learn from the discussion of the case?
- What do they already know that applies to the case?
- What are the issues that may be raised in discussion?
- How will the case and discussion be introduced?
- What preparation is expected of students? (Do they need to read the case ahead of time? Do research? Write anything?)
- What directions do you need to provide students regarding what they are supposed to do and accomplish?
- Do you need to divide students into groups or will they discuss as the whole class?
- Are you going to use role-playing or facilitators or record keepers?
- If so, how?
- What are the opening questions?
- How much time is needed for students to discuss the case?
- What concepts are to be applied/extracted during the discussion?
- How will you evaluate students?
Learner-Centered

• Learner-centered environments pay careful attention to the knowledge, skills, attitudes, and beliefs that learners bring to the educational setting.

• Teachers must realize that new knowledge is built on existing knowledge—students are not blank slates.

• Therefore, teachers need to uncover the incomplete understandings, false beliefs and naïve renditions of concepts that students have when they begin a course.

• If these are ignored, students may develop understandings very different from what the teacher intends them to gain.
Peer-Reviewed Articles

• Use contrasting cases as examples.
• Contrasting cases—two examples whose differences highlight a particular point or set of points—can illustrate the particular points you are highlighting as an instructor.
• Note that experts are more likely than novices to see the relevant contrast between two complex cases that are similar in many respects.
• So it’s best to start with relatively simple cases and then move to complexity as understanding deepens.
Benefits of Technology in the Classroom

• It makes learning interesting and engaging, especially for younger generations raised on the latest technology.
• It allows for faster and more efficient delivery of lessons, both in the classroom and at home.
• It reduces the need for textbooks and other printed material, lowering long-term costs incurred by schools and students.
• It makes collaboration easier. Students, teachers, and parents can communicate and collaborate more effectively.
• It helps to build technology-based skills, allowing students to learn, early on, to embrace and take advantage of the tools technology offers.

— Phil McKinney
Instructor Pre-Recorded Video Lectures
Video-Conferencing
Model-Based Reasoning
Self-made Models

• Engage undergraduates and graduate biology students in designing **self-made models** of different viruses (Poxvirus, Herpes Simplex virus, Bromovirus, etc), bacteria, and plant/animal cells.

• Developed with **intricate** in details

• **Delivered** presentations of the viral replication cycle, the viral particles, and the different proteins involved in viral host hijacking.

• Answered questions from their peers and this gives them **tangible models** to describe processes and mechanisms of the cell and the sometimes symbiotic relationship between organisms.
Student Presentations

Student presenting about Bacteriophage in Virology Class using model-based reasoning for concept delivery
Model-Based Reasoning

Cytomegalovirus
Group Work

Using collaborative group work effectively!!!
Think-Pair-Share
Think-Pair-Share

• Students **think** about concepts to themselves, then **pair** up in groups to discuss their ideas and finally they **share** their ideas as a group to the rest of the class.

• Then they pair up with different groups and discuss their ideas a second time. This helps clear up any misconceptions as I facilitate the learning by going to different groups within the classroom as they discuss.
Non-Majors Course

*Ownership
*Value
*Agency
Think-Pair-Share
Student Pre-Recorded Lectures
Civic Engagement

• Students ponder about their professional careers and ways in which they can start engaging with the population they plan on serving through civic engagement in their local community as students instead of waiting until they are in their fields.

• Performed different activities (public speaking)
  – community outreach
  – voter registration assistance
  – collecting and delivering toiletries to the women and children’s shelter as a class,
  – going to the boys and girls club being mentors to the children and tutoring at local public school
  – created fun videos about these activities
    • we watched them in class and had discussions about social justice in science through activism.
Role Playing, Skits, and Creativity
Public Service Announcements

What are a couple of ways people utilize their water sources?

This bacterium caused diseases such as hepatitis, maybe legionnaire's disease, and definitely more...

Original water source: Lake Huron
Current water source: Flint River

*Estimated Savings by switching water sources: $2,000,000

https://www.youtube.com/watch?v=5T50QjPXtho
Civic Engagement/Community Outreach

https://www.youtube.com/watch?v=114EPLvlCjs&t=21s

Civil Engagement Project

Kiana Dash
Bria Waller
Keyonna Hampton
Student-Teaching
Student video-conferencing

• The students I invite to videoconference K-12 with me are students that have expressed interests in joining my session or students that may need that extra assistance in learning the concept.
If you think of cells like cities: Cities make up states, States make up our country the United States, and then countries combine to make up the world. When all the cities, states, and countries work together there is peace and balance.

II. Animal and Plant Cells
1. Looking at the diagrams of animal and plant cells, what organelles do plant cells have that animal cells do not?

2. What could these different organelles do in a plant?
   a. Amyloplasts - change starch into sugar for energy

Pass out handouts
Problem/Solution

• **Original problem** before co-teaching with me
  – minimum understanding the difference between the different types of cells and their major functions.
    • concept of plant vs. animal cell was through
    • Prep by learning the material ahead of time
    • engaging the younger students by demonstrating and talking them through the lesson

• **A Solution** for her learning and making salient in her mind

**she was learning the art of teaching for when she has to teach in the future.**
“Dr. Ero-Tolliver would mention this opportunity in class and explain how important it is to engage in community service and giving back to others. By participating in the science videoconference program with Dr. Ero-Tolliver, I was able to understand both perspectives, that of the teacher and the student. This opportunity allowed me to apply my learning and use my time to teach enthusiastic elementary school children.”
Pre and Post-Model Based Reasoning Plant/Animal Cell Biology Concept RESULTS

![Quiz Score Graph](image)
Design your activity (5 minute activity)  
After

• Think of a classroom lesson you would like to teach
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Other Pedagogical Strategies

- Beyond the Essay: Making Student Thinking Visible in the Humanities
- Teaching with Blogs
- Flipped Classrooms
- Classroom Response Systems (“Clickers”)
- Collaborative Learning
- Digital Labs and Simulations
- Digital Timelines
- Group work: Using cooperative learning groups effectively
- Incorporating Research into Science Courses
- Just-in-Time Teaching (JiTT)
- Learning and Course Management Systems (LMS/CMS)
- Leveraging Travel Abroad: Collecting and Teaching with Authentic Resources
- Mindfulness in the Classroom
- Service Learning & Community Engagement
- Teaching Outside the Classroom
- Teaching Problem Solving
- Team-Based Learning
- Wikis
- Personal Devices in classrooms
Other Available “FREE” Resources

- Online Resources (In and Out-of Class)
  - Kahoot
    - https://kahoot.com/
  - Socrative
    - https://b.socrative.com/login/teacher/
  - Pollevery
    - https://www.polleverywhere.com/
  - Others

Questions?? lsi.erotolliver@hamptonu.edu