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CREDITS


The *Active Learning in the Classroom* series is sponsored by DoIT Academic Technology’s Faculty Engagement service.

FACILITATORS

**Timo Dugdale**, Senior Learning Technology Consultant
DoIT Academic Technology, Faculty Engagement

**Cid Freitag**, Senior Learning Technology Consultant
DoIT Academic Technology, Faculty Engagement

GOALS

UW-Madison’s Educational Innovation is focused on enabling pervasive active learning to improve the student experience on campus. The *Active Learning in the Classroom* series supports this campus effort by providing instructors approaches that can:

- Be implemented easily into courses without extensive course redesign;
- Encourage active dialogue between instructors and students;
- Help instructors ascertain comprehension of course content with the goal of identifying gaps and misconceptions early; and
- Facilitate deeper, higher-level learning for students.
ACTIVE LEARNING IN THE CLASSROOM

APPROACH: MUDDIEST POINT

DESCRIPTION
The instructor asks students to respond to one question:
**What was the muddiest point of the content you have learned?**

PURPOSE
This approach can facilitate reflection from a lecture, discussion, homework, or lab. It provides information on what students find least clear or most confusing. Instructors can use that feedback to discover which points are most difficult for students and guide their teaching accordingly. Students must be able to identify and communicate what they do not understand. Instructors must be able to respond in new ways or with new approaches to that topic.

SUGGESTIONS FOR USE
This approach can be used in any setting, however, it is particularly well suited for large, lower-division classes. Since students’ responses usually consist of a few words or phrases, the instructor can quickly read and sort through them. Use this approach at the end of a lecture, at the close of a discussion, or after a reading assignment.

SUPPORTED TEACHING GOALS
- Improve skill at paying attention.
- Develop ability to concentrate.
- Improve listening skills.
- Develop appropriate study skills, strategies, and habits.
- Learn terms and facts of the subject.
- Learn concepts and theories of the subject.
COURSE INFORMATION

Course: MUSIC 319 – Topics in Music and Ethnicity in the US
Class Size: 100 students
Classroom Type: classroom with movable tables and chairs
Staffing Resources: 1 Instructor

TEACHING CHALLENGE

Course Objective: Be able to describe and explain elements of blues and blues history verbally (orally and in writing).
Unit Objective: Recognize presence of 12-bar blues, 8-bar blues, and song-form patterns in examples played.

Pre-Class Work
• Watch TV episode History Detective: Lost Musical Treasure.

In-Class Scenario: Instructor knows from past semesters that students struggle with these concepts.

ACTIVE LEARNING APPROACH

Using the Muddiest Point approach, the instructor passes out half sheets of paper and ask students to answer two questions: What is one concept you are having trouble understanding about 12-bar and 8-bar blues? Students are given five minutes for the activity. Papers are collected.
WHAT DO YOU DO NEXT?

Try to identify one response you could facilitate with the results of the muddiest point activity. Factor the following variables into your response:

- **Desired Outcome**: To discover which points are most difficult for students.
- **Situational Factors**: 100 students in large lecture hall with fixed seating with one instructor and no TA present in class.

GROUP ACTIVITY

Break up into groups and share your ideas for facilitating a response to the application cards activity.

REPORT OUT

Report the results of your group discussion.
ACTIVE LEARNING IN THE CLASSROOM

APPROACH: APPLICATION CARDS

DESCRIPTION
The instructor asks students to respond to one question: What is a real-world application for the content you have learned?

PURPOSE
This approach lets instructors know how well students understand and can apply what they have learned. It prompts students to think about possible applications and to connect newly-learned concepts with prior knowledge. It may also help students see more clearly the relevance of what they are learning.

SUGGESTIONS FOR USE
This approach could be used in almost any course, as most disciplines could emphasize application of knowledge. It can be adapted to a wide variety of class sizes and types.

SUPPORTED TEACHING GOALS
- Develop ability to apply principles and generalizations already learned to new problems and situations.
- Develop ability to draw reasonable inferences from observations.
- Develop ability to think creatively.
- Develop appropriate study skills, strategies, and habits.
- Learn concepts and theories in the subject.
- Develop an appreciation of the liberal arts and sciences.
- Develop a capacity to think for oneself.
COURSE INFORMATION

Course: History 350 – WW1 and the Shaping of 21st Century Europe
Class Size: 150 students
Classroom Type: lecture hall with fixed seats
Staffing Resources: 1 Instructor, 1 TA

TEACHING CHALLENGE

Course Objective: Students will develop an understanding of the ways historical thinking can help us understand today’s events.
Unit Objective: Students will be able to discuss at least five major factors that were thought to have brought about war in 1914.

Pre-Class Work
• Listen to four audio lectures (10 minutes each).
• Take quiz on content.

In-Class Scenario: Quiz scores showed students understood content, but could not draw comparisons to modern day events.

ACTIVE LEARNING APPROACH

Using the Application Card approach, the instructor passes out note cards and ask students to provide one example of how one of the five factors that brought about war in 1914 can be seen in current events in Europe. Students are given five minutes. Cards are collected.
WHAT DO YOU DO NEXT?

Try to identify one response you could facilitate with the results of the applications cards activity. Factor the following variables into your response:

- **Desired Outcome**: To help students apply knowledge to real world situations.
- **Situational Factors**: 150 students in large lecture hall with fixed seating with one instructor and one TA present in class.

GROUP ACTIVITY

Break up into groups and share your ideas for facilitating a response to the application cards activity.

**Alternate Approach**: Use the example on Page 7 with the following change: You have no TA in class to help you facilitate this approach.

REPORT OUT

Report the results of your group discussion.
The instructor asks students to respond to two questions: What was the most important thing you learned? What is still unclear?

PURPOSE

This approach forces students to recall the content they have learned and self-assess how well they have understood that content. The approach also provides an easy way to collect written feedback on student learning with minimal investment of time and planning. By asking students to reflect, instructors can see how well students are learning and make necessary corrections or changes. This approach ensures that students’ questions will be raised in time to facilitate learning.

SUGGESTIONS FOR USE

This approach is useful in lecture or lecture/discussion courses. It can also be used to assess what students learned from a lab section or pre-class activity. It can be used at the beginning or end of the class period as either a warm-up or wrap-up activity. Because it is quick to administer and easy to analyze, it is well suited for large classes.

SUPPORTED TEACHING GOALS

- Develop ability to synthesize and integrate information and ideas.
- Develop ability to think holistically.
- Improve skill at paying attention.
- Develop ability to concentrate.
- Improve listening skills.
- Develop appropriate study skills, strategies, and habits.
- Learn terms and facts of the subject.
- Learn concepts and theories of the subject.
ACTIVE LEARNING IN THE CLASSROOM

EXAMPLE: MINUTE PAPERS

COURSE INFORMATION

Course: NURSING 590 – Support for People with Dementia
Class Size: 30 students
Classroom Type: collaborative classroom
Staffing Resources: 1 Instructor

TEACHING CHALLENGE

Course Objective: Summarize neurobiological changes related to cognitive impairment and dementia.
Unit Objective: Identify common cognitive changes in early/mid/late stage dementia.

Pre-Class Work
• Background readings on MRI and cognitive assessment.
• Online quiz.

In-Class Scenario: Quiz score showed that several questions were missed by majority of students.

ACTIVE LEARNING APPROACH

Using the Minute Paper approach, the instructor passes out half sheets of paper and ask students to answer two questions:
• What was the most important thing you learned about neurobiology changes to cognitive impairment?
• What questions still remain?
Students are given five minutes. Papers are collected.
ACTIVE LEARNING IN THE CLASSROOM

EXERCISE: MINUTE PAPERS

WHAT DO YOU DO NEXT?

Try to identify one response you could facilitate with the results of the minute paper activity. Factor the following variables into your response:

- **Desired Learning Outcome**: To help student to recall the content they have learned and self-assess how well they have understood that content.
- **Situational Factors**: 30 students in collaborative classroom with one instructor and no TA present in class.

GROUP ACTIVITY

Break up into groups and share your ideas for facilitating a response to the minute paper activity.

REPORT OUT

Report the results of your group discussion.
ACTIVE LEARNING IN THE CLASSROOM

APPROACH: QUIZ QUESTIONS

DESCRIPTION

The instructor asks the class: Write down one to three questions you would expect to see on the next test or quiz, along with the correct answer to each question.

PURPOSE

This approach allows instructors to see what content students consider most important or memorable, what they understand to be fair and useful test questions, and how well they can answer the questions they have posed. It can help students assess how well they know the material. Receiving feedback can help them refocus their studying.

SUGGESTIONS FOR USE

This approach can be used in any course in which students take quizzes. Instructors should only use this approach, however, if they intend on including revised student questions in their quizzes. The approach should take place well before a quiz is to be administered to allow the instructor to adjust teaching approaches and to ensure students have time to adjust their studying.

SUPPORTED TEACHING GOALS

- Develop ability to apply principles and generalizations already learned to new problems and situations.
- Develop appropriate study skills, strategies, and habits.
- Learn terms and facts of this subject.
- Learn concepts and theories in this subject.
- Learn to evaluate methods and materials in the subject.
- Develop ability to perform skillfully.
ACTIVE LEARNING IN THE CLASSROOM

EXAMPLE: QUIZ QUESTIONS

COURSE INFORMATION

Course: GEOSCI 117 – Life in Earth’s Extreme Environments
Class Size: 40 students
Classroom Type: movable tables and chairs
Staffing Resources: 1 Instructor

TEACHING CHALLENGE

Course Objective: Utilize ribosomal RNA gene sequence information to determine the identity of unknown microorganisms and place them on the overall “Tree of Life.”

Unit Objective: Develop an understanding of the incredible diversity of microbial metabolic lifestyles and apply it to analyzing life in extreme environments on Earth and other worlds.

Pre-Class Work

• Online reading about DNA sequence analysis background; origin of the “universal tree of life” on Earth. Online quiz.

In-Class Scenario: Quiz results show students are struggling with many different concept. Instructor lectures on ribosomal RNA gene sequencing and focuses on issue raised in quiz results.

ACTIVE LEARNING APPROACH

Using the Quiz Questions approach, the instructor passes out note cards at the end of lecture. She asks students to write three questions and answers related to microbial metabolic lifestyles and how it applies to extreme environments on Earth.
WHAT DO YOU DO NEXT?

Try to identify one response you could facilitate with the results of the quiz questions activity. Factor the following variables into your response:

- **Desired Outcome**: To have students consider what content is most important, what they understand to be fair test questions, and how well they can answer those questions.
- **Situational Factors**: 40 students in classroom with movable tables and chairs with one instructor and no TA present in class.

GROUP ACTIVITY

Break up into groups and share your ideas for facilitating a response to the quiz questions activity.

**Alternate Approach**: Use the example on Page 15 with the following change: You have 100 students instead of 40.

REPORT OUT

Report the results of your group discussion.
ACTIVE LEARNING
IN THE CLASSROOM

APPROACH: OPINION POLLS

DESCRIPTION
The instructor asks students to raise their hands or hand-held response cards to indicate agreement or disagreement with a statement. **Raise the yellow card if you think this statement is true. Raise the red card if you think the statement is false.**

PURPOSE
This approach can help instructors discover opinions about course-related issues with some degree of anonymity for students and provide more accurate data to which instructors can respond. It can be used to measure pre-existing opinions that can distort or block the instructional message. This approach encourages students to discover their own opinions about issues, to compare their opinions with those of other students, and to test their opinions against evidence and expert opinion.

SUGGESTIONS FOR USE
This approach can be used to prepare students to discuss a controversial issue or to assess their opinions after they have studied the materials. It can be used as a pre- or post-assessment device to determine whether and how students’ opinions have changed in response to class discussion. It can be used to almost any class, regardless of size or topic.

SUPPORTED TEACHING GOALS

- Learn to understand perspectives and values of the subject.
- Develop an openness to new ideas.
- Develop an informed concern about contemporary social issues.
- Develop capacity to make informed ethical choices.
- Develop a commitment to one’s own values.
ACTIVE LEARNING IN THE CLASSROOM
EXAMPLE: OPINION POLLS

COURSE INFORMATION

Course: PSYCH 560 – Child Psychology
Class Size: 210 students
Classroom Type: lecture hall with fixed seats
Staffing Resources: 1 Instructor, 1 TA

TEACHING CHALLENGE

Course Objective: Analyze, assess, and use knowledge about child development to guide decision-making.
Unit Objective: Summarize flaws in previous models of child development.

Pre-Class Work
• Read about the four primary approaches to children’s learning.
• Watch video – Child Observation.
• Identify models of learning in the video.
• Take quiz on content to measure comprehension.

In-Class Scenario: Quiz scores show an inability by students to identify flaws in models of child development.

ACTIVE LEARNING APPROACH

Using the Opinion Poll approach, the instructor passes out yellow and blue note cards. He reads several scenarios (prepared before class) and asks student to raise yellow card for TRUE or red card for FALSE if you think this is a weak model of child development.
WHAT DO YOU DO NEXT?

Try to identify one response you could facilitate with the results of the opinion poll activity. Factor the following variables into your response:

- **Desired Outcome**: To have students discover their own opinions about issues, and compare their opinions with other students.
- **Situational Factors**: 210 students in lecture hall with fixed seating with one instructor and one TA present in class.

GROUP ACTIVITY

Break up into groups and share your ideas for facilitating a response to the opinion poll activity.

REPORT OUT

Report the results of your group discussion.
ACTIVE LEARNING IN THE CLASSROOM

APPROACH: THINK/PAIR/SHARE*

DESCRIPTION
The instructor asks a question, gives students a few minutes to think about a response, and then asks them to share their ideas with a partner. Take a few moments and think about ______________.

PURPOSE
This approach requires students to stop and reflect before speaking, thus giving them an opportunity to collect and organize thoughts. It encourages students to compare and contrast their understandings with those of another and to rehearse their response first in low-risk situations before going public with the whole class.

SUGGESTIONS FOR USE
This approach can be used in any setting but is good at times when you want students to reflect on a topic. Since the greatest challenge to using this approach is for the instructor to form an engaging question, this approach is best used when you can identify an opportunity before class.

SUPPORTED TEACHING GOALS

- Develop ability to apply principles and generalizations already learned to new problems and situations.
- Develop ability to synthesize and integrate information and ideas.
- Develop ability to pay attention.
- Develop ability to work productively with others.
- Develop appropriate study skills, strategies, and habits.
- Learn terms and facts of the subject.
- Learn concepts and theories of the subject.

* Taken from "Collaborative Learning Techniques: A Handbook for College Faculty" by Barkley, Major, and Cross.
ACTIVE LEARNING IN THE CLASSROOM
EXAMPLE: THINK/PAIR/SHARE

COURSE INFORMATION

Course: HORT 376 – Tropical Horticultural Systems
Class Size: 80 students
Classroom Type: lecture hall with fixed seats
Staffing Resources: 1 Instructor, 1 TA

TEACHING CHALLENGE

Course Objective: Understand challenges to food security and sustainability in tropical ecosystems.
Unit Objective: Identify challenges small farmers and large-scale producers face in tropical regions.

Pre-Class Work
• Write 500 word commentary of the article. Post in CMS.

In-Class Scenario: The instructor reads commentaries and noticed students were not able to recognize the causal relationship between farming practices and disease-related problems with banana plants.

ACTIVE LEARNING APPROACH

Using the Think/Pair/Share approach, the instructor passes out half sheets of papers and asks students to reflect on the question, “What is one solution farmers in the article could use to address the current problems with disease in banana plants?” Students are given five minutes to reflect and write. They are asked to partner with the person next to them and share their solution and critique the other student’s idea.
WHAT DO YOU DO NEXT?

Try to identify one response you could facilitate with the results of the think/pair/share activity. Factor the following variables into your response:

- **Desired Outcome**: To have students reflect on content, then compare and contrast their understandings with those of another.
- **Situational Factors**: 80 students in lecture hall with fixed seating with one instructor and one TA present in class.

GROUP ACTIVITY

Break up into groups and share your ideas for facilitating a response to the think/pair/share activity.

**Alternate Approach**: Use the example on Page 23 with the following change: You are teaching in a room with movable tables and chairs.

REPORT OUT

Report the results of your group discussion.