

# Empowering Student Engagement in Lab Courses

Alice Martinic, PhD



# Objectives

Be able to:

- clearly articulate course goals for students in lab courses
- explore strategies to effectively prepare for and facilitate lab sections
- recognize the importance of giving meaningful feedback by grading fairly and consistently



Design

Facilitate

Assess

# Agenda

- Reflection on Benefits & Challenges of Labs
- Goals & Expectations
- Preparation & Facilitation Strategies
- Grading & Feedback
- General Tips & Tricks
- Wrap-up & Evaluation



# What is a Lab?

What is a lab?



# Benefits & Challenges of Labs

What is a lab?



- What are the benefits of lab courses for students?
- What are unique challenges you have experienced or anticipate experiencing when teaching lab courses?

# Goals & Expectations

Put yourself in the role of your students and write answers to these questions:

1. What expectations do you have for this course?
  - a. In particular, what do you expect working with a lab partner to look like?
2. What do you hope to be able to do at the end of the course you're taking?



# Goals & Expectations

In your role as instructor, write answers to the following questions:

1. What expectations do you have for your students in this course?
  - a. In particular, what do you expect teamwork to look like?
2. What do you hope your students are able to do at the end of the course?



# Goals & Expectations

Design

Student  
expectations



Instructor  
expectations

# Goals & Expectations

“Students who receive transparent instruction about the purposes, tasks and criteria for their academic work report gains in three areas that are important predictors of students’ success:

- academic confidence,
- sense of belonging,
- and mastery of the skills that employers value most when hiring.”



# Preparation and Facilitation Strategies

Read the list of strategies on the “Preparing for and Facilitating Section” handout.

Which (new-to-you) strategy will you try and why?

Which strategy do you anticipate being most challenging to implement? Why?

Discuss in small groups.



# Evaluation Scheme Criteria

An orange downward-pointing arrow with the word "Assess" written in white inside it.

Assess

## VALIDITY

The grades reflect only how well the students met the targeted objectives and are not affected by the students' prior grades, their personal attributes, or anything else but the quality of their work.

## RELIABILITY

A given product would get almost identical grades from two or more independent expert raters and from the same rater at two different times (such as early and late in the grading of a submitted assignment).

## EFFICIENCY

The instructor can grade all the work and give students good constructive feedback without spending an inordinate amount of time.

## FAIRNESS

The knowledge and skills being assessed were adequately taught, and the students knew in advance the criteria that would be used to rate their efforts.

# Strategies: Grading Criteria & Rubrics

Read the list of strategies on the “Grading and Feedback” handout.

Write one or more criteria in the column on the right that best align with the strategy.

VALIDITY

RELIABILITY

EFFICIENCY

FAIRNESS

# General Tips & Tricks

- Have a shared Google doc or Canvas course with questions/answers, common mistakes/pitfalls, additional resources, etc.
- Have TAs attend a section earlier in the week if they haven't experienced the lab before.
- Have students submit all assignments on Canvas and utilize SpeedGrader.
- Continue learning from your peers, and if you have additional questions I am happy to meet with you.

# Wrap Up

Recall and write down one strategy you can use this semester in your classroom – write it down to hold yourself accountable!

## Objectives

Be able to:

- clearly articulate course goals for students in lab courses
- explore strategies to effectively prepare for and facilitate lab sections
- recognize the importance of clarity and expectations when developing effective rubrics

# THANK YOU!

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Keep an eye out for an invitation to join a Canvas OnDemand course where you can:

- Revisit strategies and dig deeper
- Apply what you learned to your own courses in more detail
- Earn a badge for demonstrating skill proficiency

# Resources

- Felder, R. M., & Brent, R. (2016). Teaching and learning STEM: A practical guide. John Wiley & Sons.
- Transparency in Learning and Teaching, <https://tilthighered.com/>
- Center for Educational Effectiveness at University of California, Davis. Just in Time Teaching Resources: Facilitating Labs.  
<https://cee.ucdavis.edu/jitt/facilitating-labs>
- Center for Research on Learning & Teaching, University of Michigan. Lab Teaching.  
<http://www.crlt.umich.edu/resources/lab-teaching>