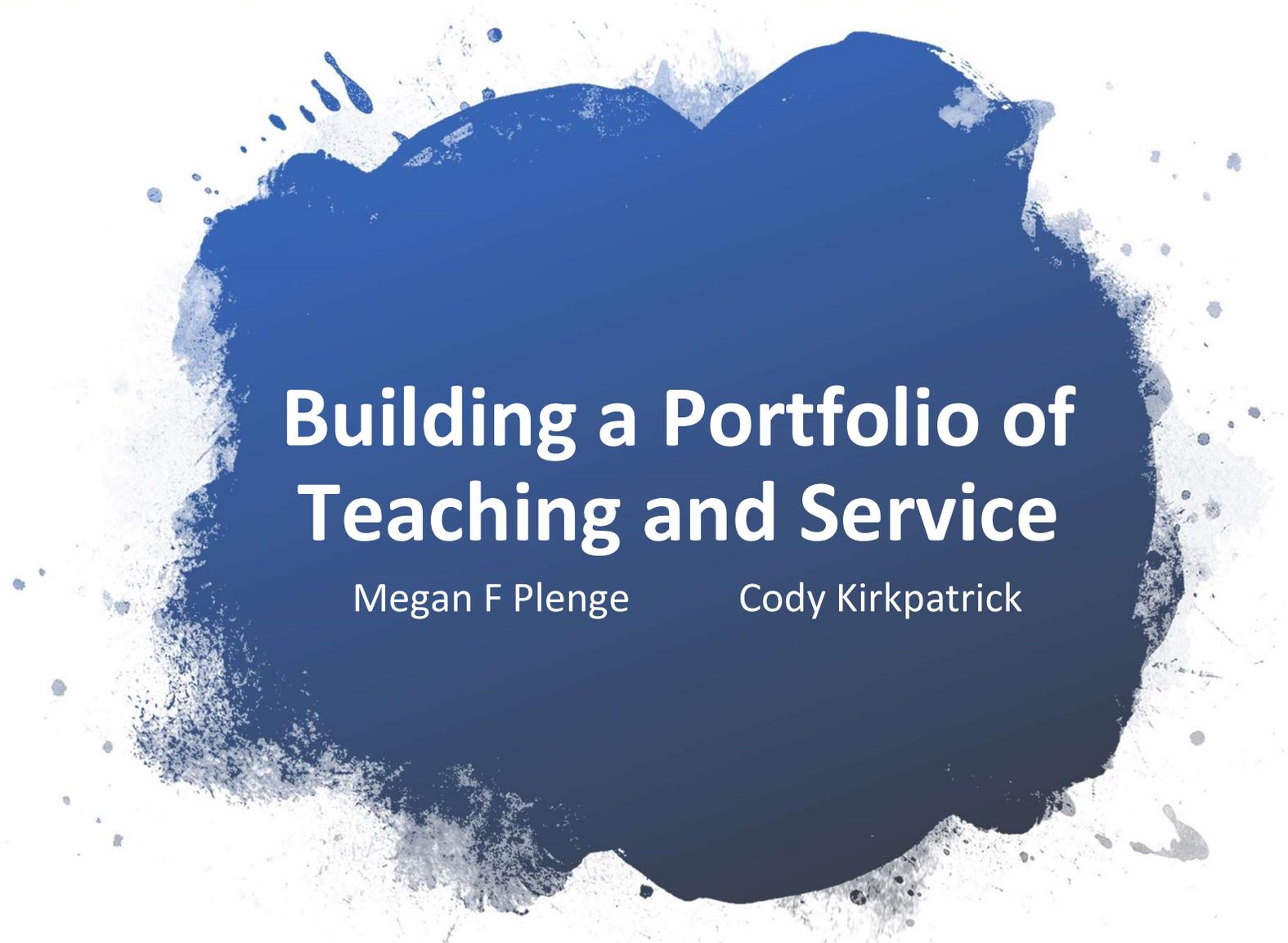


---



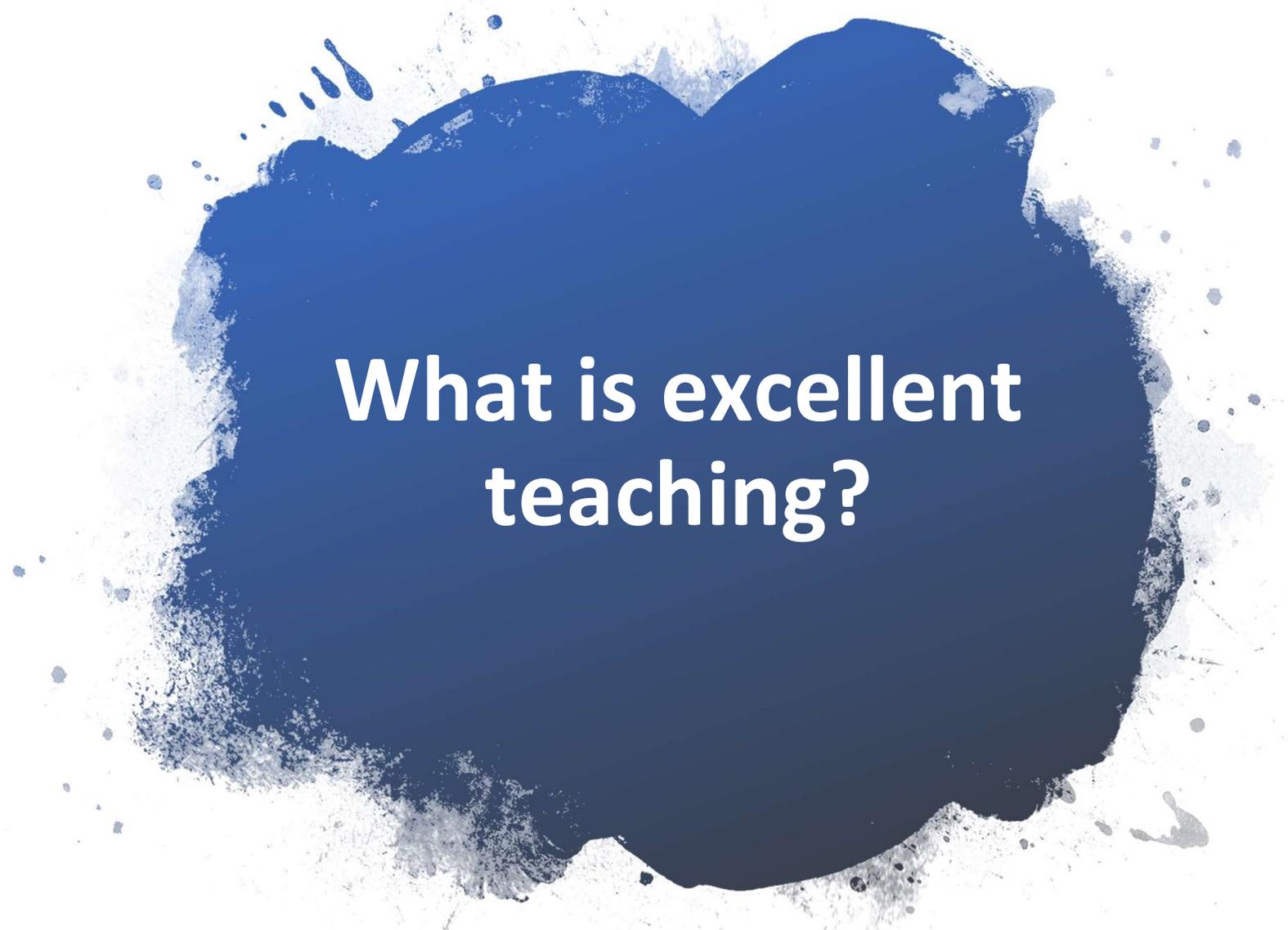
# Building a Portfolio of Teaching and Service

Megan F Plenge

Cody Kirkpatrick

---

---



**What is excellent  
teaching?**

---

**“Demonstrable evidence  
of extraordinary  
teaching and  
extraordinary service to  
the Department”**



# Part 1: Showing evidence of learning outcomes

- Define learning objectives for the course (content- or skill-based)
- Generate pre-assessment questions based on learning objectives
  - ...Validated assessments: GLE <https://serc.carleton.edu/integrate/about/gle.html>; GCI <https://geocognitionresearchlaboratory.com/research-in-the-grl/research-related-to-understanding/>
- Use pre-and post- assessments to measure student's progress
- Example: 8 multiple-choice questions administered as a pre-test & on the final.

Whole class  
(n=115)

Average  
score  
pre-test:  
41.1%

Average  
score  
post-  
test:  
70.1%

Gain:  
29%  
points

# Spring 2019 Results (n=115)

	LO1 Q.1	LO2 Q.1	LO2 Q.2	LO3 Q.1	LO3 Q.2	LO4 Q.1	LO5 Q.1	LO5 Q.2
PRETEST: % CORRECT	47.8%	62.6%	8.7%	47%	43.5%	48.7%	14.8%	55.7%
POST-TEST: % CORRECT	79.1%	76.5%	71.3%	86.1%	36.5%	88.7%	37.4%	85.2%

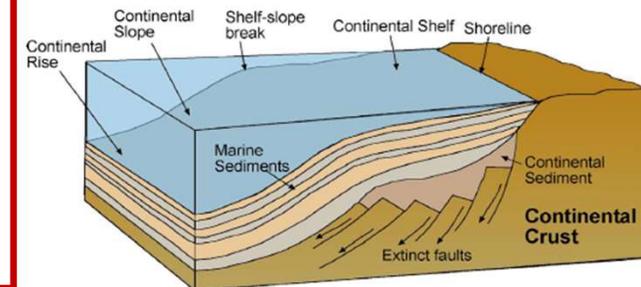
In general, the annual probability of a magnitude 7 earthquake event along a plate boundary:

- Is directly related to the number of volcanic eruptions at the same boundary
- Is higher at a convergent boundary than a transform boundary
- Is less than the probability of a magnitude 5 earthquake event at the same fault
- All of the above

**Use this diagram for the next question →**

10. This is a passive margin, which is an “extinct” plate boundary. What type of plate boundary used to be active here?

- Convergent
- Transform
- Divergent



# Spring 2019 Results (self-identified African American and Hispanic Students, n=18)

	LO1 Q.1	LO2 Q.1	LO2 Q.2	LO3 Q.1	LO3 Q.2	LO4 Q.1	LO5 Q.1	LO5 Q.2
PRETEST: % CORRECT	44.4%	50%	5.6%	33.3%	55.6%	38.9%	5.6%	44.4%
POST-TEST: % CORRECT	66.7%	72.2%	77.8%	66.7%	16.7%	83.3%	11.1%	77.8%

Average score pre-test: 41.1%

Whole class (n=115)

Average score post-test: 70.1%

Gain: 29% points

African American and Hispanic students (n=18)

Average score pre-test: 34.7%

Average score post-test: 59%

Gain: 24.3% points

# Spring 2019 Results (self-identified female students, n=61)

	LO1 Q.1	LO2 Q.1	LO2 Q.2	LO3 Q.1	LO3 Q.2	LO4 Q.1	LO5 Q.1	LO5 Q.2
PRETEST: % CORRECT	44.3%	59%	13.1%	52.5%	41%	52.5%	14.8%	59%
POST-TEST: % CORRECT	80.3%	73.8%	70.5%	85.2%	42.6%	88.5%	29.5%	80.3%

Average score pre-test: 41.1%

Whole class (n=115)

Average score post-test: 70.1%

Gain: 29% points

Female students (n=61)

Average score pre-test: 42%

Average score post-test: 68.9%

Gain: 26.9% points

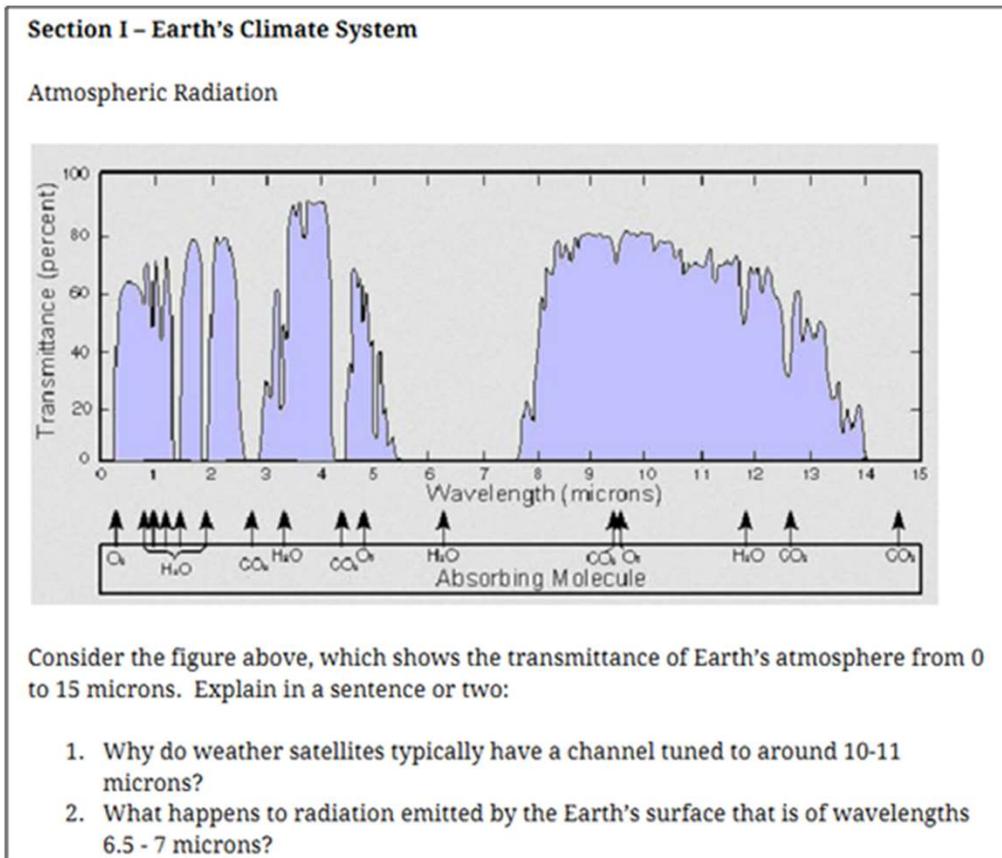
## Part 1: Showing evidence of learning outcomes

- At IU, showing this evidence is required as part of our **annual** College assessment process
  - So if I'm already doing the work... I'll include it in my teaching portfolio also!
  - Ask: what are the competencies I value in my course? How does a student demonstrate "success"?

## Example from Senior-level Climate Change Science

← Questions on the final exam

An “exemplary” student response:



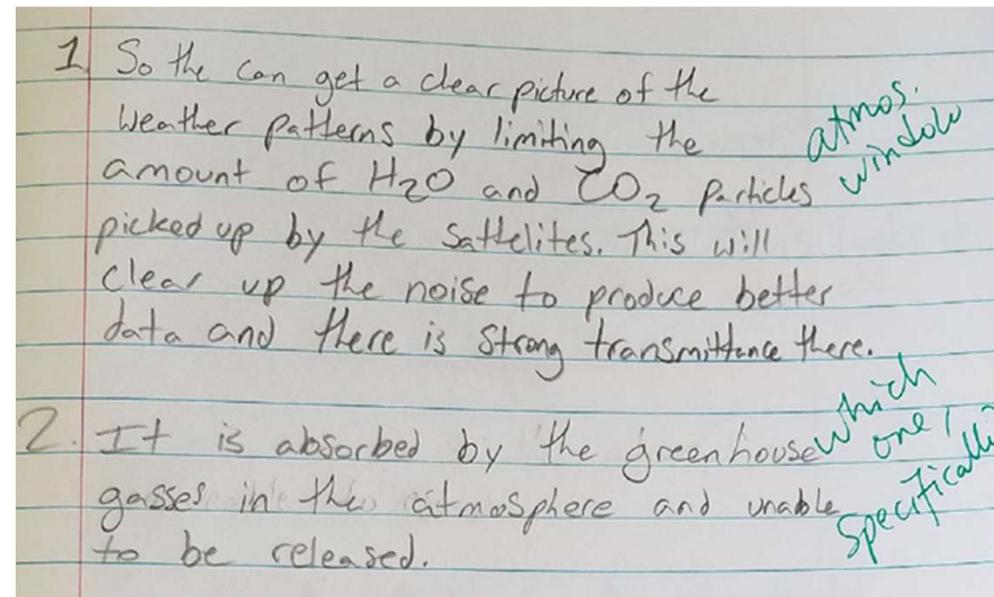
1. The atmospheric window exists at about 10-11 microns, which means longwave radiation can escape Earth's atmosphere here. So, at 10-11 microns, there is likely little interference from greenhouse gases on weather predictions.

2. Radiation emitted by Earth's surface that is of wavelength 6.5-7 microns is absorbed by H<sub>2</sub>O molecules (water vapor).

## Example from Senior-level Climate Change Science

- My satisfactory threshold: score 3+ points out of 4
- 9 of 13 students met that threshold
- Don't forget to **reflect** on your results: common student errors? Can you address those in a new way next term? What does "success" mean? 100%??!?

A "deficient" student response:



# Work Time!

- Write/Identify learning objectives for their course
- Write/Identify assessments that align with these learning objectives
- If objectives and assessments have already been done in class, how will you analyze/contextualize the data?

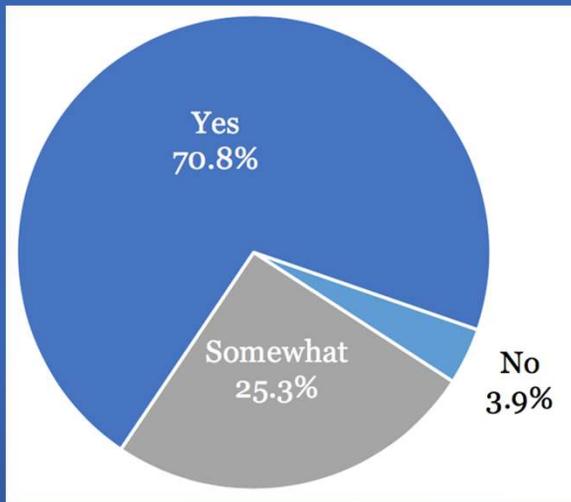
## Part 2: Student confidence and attitudes towards geoscience

\*  $p < .05$ .

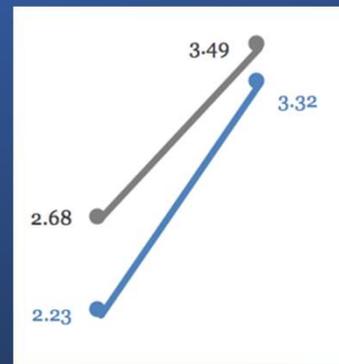
\*\* $p < .005$

\*\*\* $p < .0005$

<i>Descriptive Statistics and t-test of GEOL 101 Lab Survey</i>	Before BeAM project		After BeAM project			95% CI for Mean Difference	r	t	df
	M	SD	M	SD	n				
How confident were you in your ability to...									
...come up with a hypothesis to answer a scientific question	2.87	0.828	3.61	0.577	233	-0.842, -0.652	.497***	-15.464***	232
...design an experiment to test a hypothesis	2.42	0.865	3.39	0.622	231	-1.071, -0.877	.538***	-19.856***	230
...define "scientific model" and give examples of scientific models	2.37	0.875	3.40	0.637	231	-1.135, -0.917	.419***	-18.589***	230
...create a scientific model to test a hypothesis	2.20	0.865	3.34	0.684	232	-1.246, -1.039	.485***	-21.713***	231
....interpret data collected in an experiment to determine which hypothesis is best supported	2.79	0.886	3.64	0.602	233	-0.949, -0.734	.424***	-15.408***	232



Pre-/post- difference in student self-confidence in ability to....  
(female=blue, male-gray)



...design an experiment to test a hypothesis



...interpret data collected in an experiment to determine which hypothesis is best supported

Results of attitudinal/confidence survey

# Work time!

- Explore and/or develop survey questions appropriate to your course (and the platform you wish to use)
- [https://nagt.org/nagt/geoedresearch/toolbox/instruments/collection\\_1.html](https://nagt.org/nagt/geoedresearch/toolbox/instruments/collection_1.html)
  - Find questions from validated surveys that work for your course
  - Develop your own questions based on class objectives/content

---

## Part 3: Contextualizing Course Evaluations

What is the value of end-of-term course evaluations?

---

## Part 3: Contextualizing Course Evaluations

Finding value in the **qualitative** (free response) questions via coding the student responses

- Descriptive coding
- In-vivo coding (no time for this today)

---

## Part 3: Contextualizing Course Evaluations

Work Time! Let's practice Descriptive Coding

1. "Group like comments together. Discard those that are irrelevant to the course, curriculum, or teaching."
2. "Create categories for your comments. E.g., teacher; curriculum; pedagogy; class sessions."

---

## Part 3: Contextualizing Course Evaluations

3. Now, you could either
  - a. Quantify them by counting the number of comments
  - b. Categorize further: positive, negative, out of your control
4. End by identifying two or three things to address for next semester.

## Part 3: Contextualizing Course Evaluations

Class sessions: too slow (7); too fast (5); didn't like group work (4)

Exams: "difficult," "challenging," "hard," "not long enough"

Homework: harsh grading, unclear criteria, "no idea what I did wrong"

Code	Number
Class Sessions	19
Exams	14
Homework	13
Difficult	0

## Part 3: Contextualizing Course Evaluations

### Interventions for Spring 2019

- Detailed grading rubric for each homework; norming session; share rubric with students!
- More examples of high-level Bloom's Q's shared in class

Code	Number
Class Sessions	19
Exams	14
Homework	13
Diff. L.	0

---



**What else can you  
do to strengthen  
your portfolio?**

---

# Work Time!

- Refer to the skeleton outline on hand-out, “Contents of a Typical Teaching Dossier”
- Write your own outline of what you’d like to include/work on for your own portfolio
- Reflective statement: How have you improve your teaching by looking at these metrics?

# Peer Teaching Evaluations:

## What can you do?

### Who?

- Departmental Faculty/mentors
- Teaching faculty from other departments
- Teaching support staff

### How?

- Encourage use of a rubric
- Ask for feedback/insights in person after observation

### Why?

- Contextualizing course evaluations
- Make yourself visible to other faculty
- Get valuable feedback on your teaching