Session Outline

1. Introduction to Traditional and Alternative Grading (10 mins)

2. Preliminary Reports from Instructors (40 mins)

   - Dr. Suborna Ahmed (Forestry)

   - Drs. Marcia Graves and David Oliver (Microbiology and Immunology)

   - Dr. Giulia Toti (Computer Science)

3. Discussion (10 - 15 mins)

Defining "Traditional" Grading

1. Assigning weights to each activity, awarding marks/points/letter-grades, tallying it in a spreadsheet, and then averaging for a score.

2. Rubrics, rigid deadlines, late penalties, grade distributions, regrade requests, etc...

3. Using tests, quizzes, midterms, and exams as summative assessments.
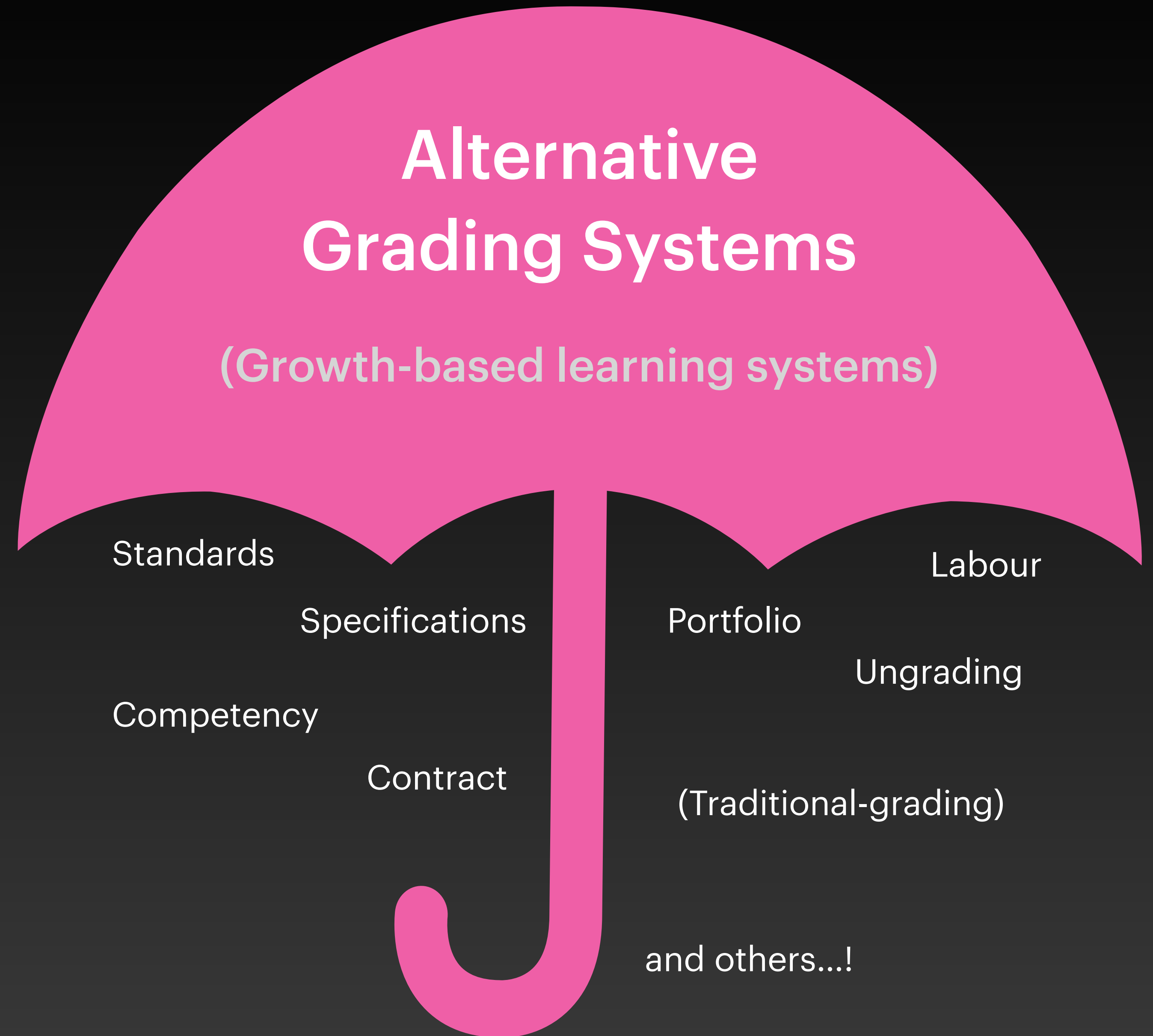
4. All of the above, in the name of fairness and rigour.

Defining "Alternative" Grading

1. Simply put, everything that shifts the focus away from any of the principles of traditional grading.

2. Dr. Robert Talbert proposed four pillars of Alternative Grading.

IN FEEDBACK LOOPS WE TRUST

CLEARLY DEFINED STANDARDS

HELPFUL FEEDBACK

MARKS INDICATE PROGRESS

REATTEMPTS WITHOUT PENALTY

Overview

Alternative
Grading Systems

(Growth-based learning systems)

Standards

Specifications

Portfolio

Labour

Ungrading

Competency

Contract

(Traditional-grading)

and others...!

❌ *NOT* growth-based

Grading on a Curve   Competitive Grading

Forced Distribution   Relative Grading

Norm-referenced Grading

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Alternative Grading System	Key Features
Standards	Students demonstrate proficiency on individual Learning Outcomes; multiple attempts are needed and LOs are evaluated individually.
Competency	Similar to standards, but with skills or tasks rather than concepts.
Specifications	Students choose from pre-set "bundles"; more effortful or challenging bundles results in higher grades; entire assessments are evaluated as a whole, with multiple attempts.
Contract	Students and instructors negotiate a contract based on a self-assessment of student strengths and limitations to achieve a particular grade.
Labour	A set of social agreements that determine how much labour it will take for student to earn a specific grade. Pay no attention to writing quality and de-emphasize white language supremacy.
Portfolio	A holistic process that involves careful and purposeful curation of artifacts weaving a particular narrative, and a reflection of their learning processes.
Ungrading	Role of points and grades is de-emphasized as much as possible, student agency is prioritized with grades determined collaboratively with lots of reflection.

Instructor Report:
Self-Assessment in a Geomatics Professional Master's Program

Suborna Ahmed, PhD
Assistant Professor of Teaching

Department of Forest Resources
Management
Faculty of Forestry, UBC Vancouver

Introduction

- Geospatial Data Analysis: GEM 530 programming based course

- 29 graduate students

- Professional Master's Program

- Reflection-Based Self-Assessment Alternative Grading Approach

Motivations

- Engage deeply with the learning materials: Identify mistakes and improvement area

- Empower students by placing them at the center of their learning

- Develop critical skills

- Reduce the teaching team's load and focus on guiding students

Before Transformation

Task Overview:

- Explore and summarize geospatial data

- Select methods based on the objective
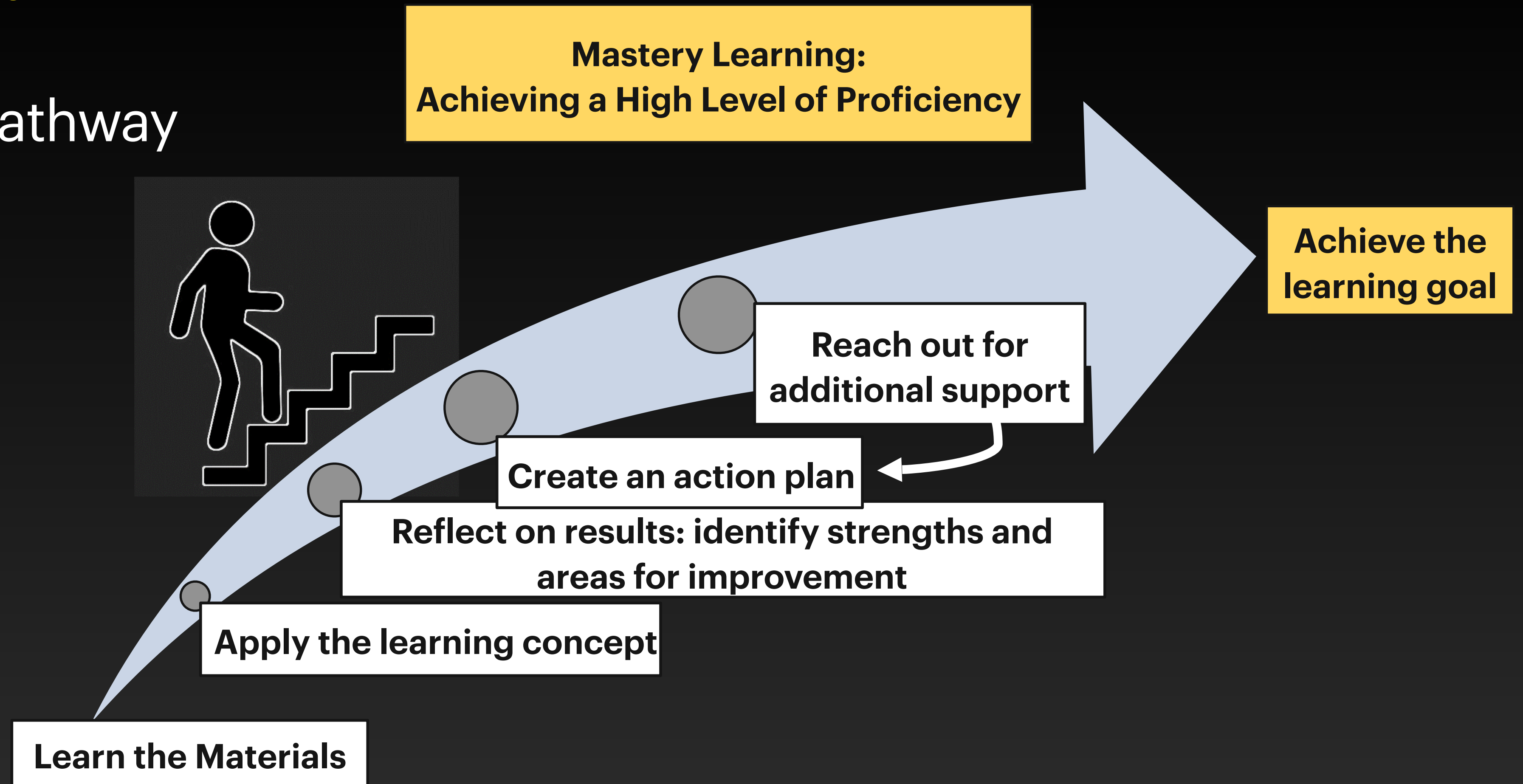
- Create a reproducible workflow

- Interpret
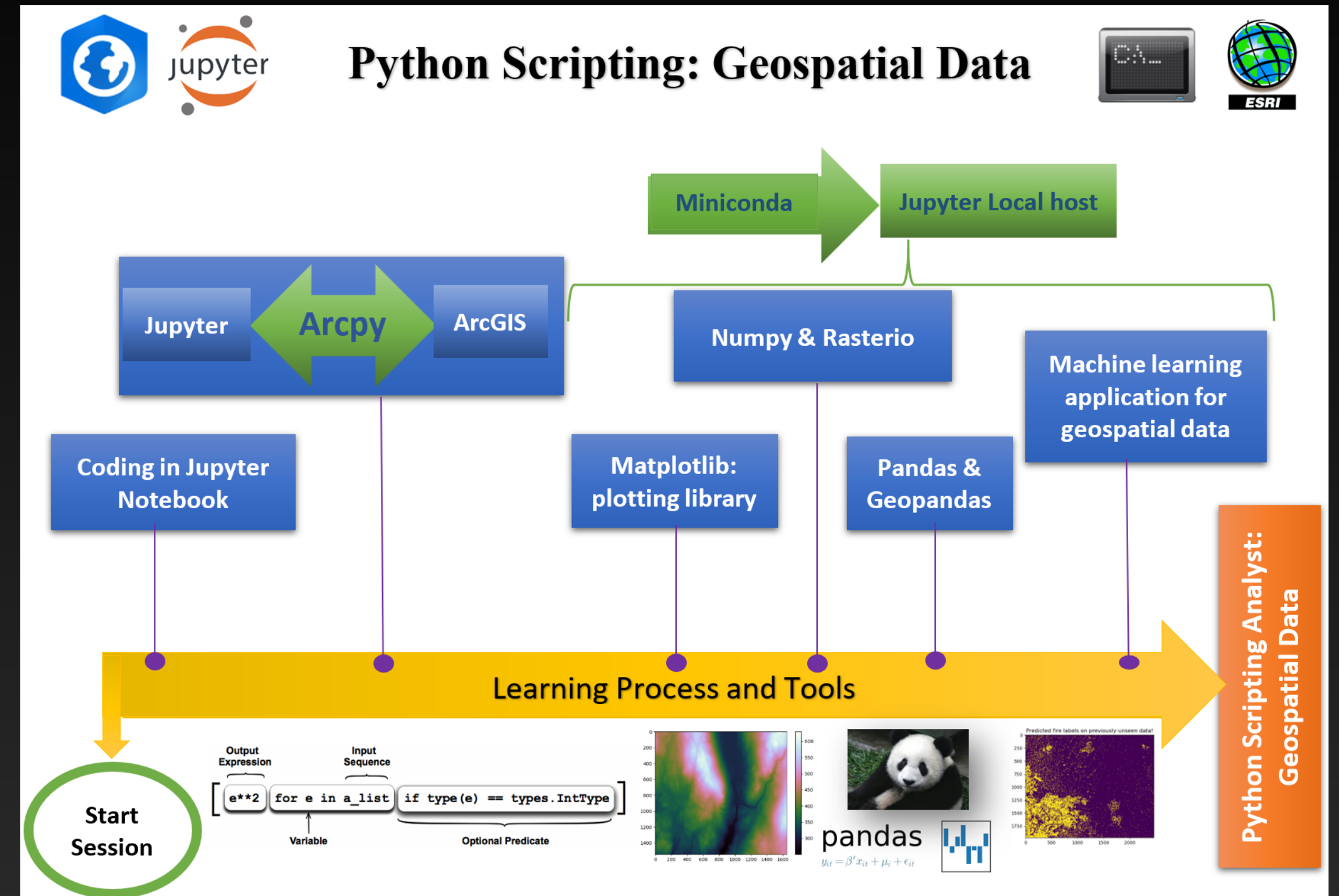
Python Scripting: Geospatial Data

Typical grading scheme:

Course Component	Weight	Due Date
Lab Assignment	50% (5×varibale)	Saturday at 6 pm
Quizzes	35% (6×varibale)	Saturday at 6 pm
Exercises	15% (9×varibale)	Saturday at 6 pm

After Transformation

- Self-Assessment Pathway

Mastery Learning:
Achieving a High Level of Proficiency

Achieve the learning goal

Reach out for additional support

Create an action plan

Reflect on results: identify strengths and areas for improvement

Apply the learning concept

Learn the Materials

Grading scheme:

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Lab Assignment	50% (5×varibale)	Saturday at 6 pm
Quizzes	35% (6×varibale)	Saturday at 6 pm
Exercises	15% (9×varibale)	Saturday at 6 pm

How did it go?

Key Observations and Outcomes:

- Engagement and participation

- Identification of learning gaps

- Impact on learning outcome

- Quality of reflection

- Instructor's Reflection:

    - Identification of gaps in learning modules

    - Effectiveness of self-assessment

    - Facilitate constructive dialogue and identify individual challenges

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Assignment Comments

Section 1   ✕

Q1: We got the right output, our second line of code is the same as the answer key, but we had an unnecessary extra line before it: featureclasses = arcpy.ListFeatureClasses().

Q2: We got the same answer and it worked.

Q3: We defined our output name outside of the for loop. The code within out for-loop is also much simpler than the answer key, but I think we get the same result.

Q4: We got the same answer however, we added featureclasses = arcpy.ListFeatureClasses(). We got less outputs but I think that has to do with our data set not the actual code itself.

Section 2

Q1: Our code is almost the same as the key. Our only difference is that we did not assign the AAB roads shapefile a name in order to make a cleaner line of code in the 'rows=' line, we just inlcuded the shp in "".

Q2: We tried to use the acrpy.management.CalculateField() function instad but I didn't work. However Evan looked at our code and said it should have run and that the error had to do with jupyter not our actual code. However I do see that a for loop would be more efficient.

Q3: Our where clause is correct, but where they key uses arcpy.SearchCursor(shp3, whereClause, "","","") we have arcpy.SearchCursor("AAB_roads_national.shp", whereClause) I'm not sure what the "","","" does in the code. Our for loop also is different. The print command in the key says print("len_mi is ", row.getValue("len_mi")) where ours is print("Length in mi for FIS:", row.FID, row.len_mi)

Next time...

- Refinement Strategies for Future Self-Assessment Implementation:
    - Enhance guidelines and criteria
    - Apply on other grading components
    - Apply peer discussion

Instructor Report:
## Portfolio Grading in the CURE labs

Introduction

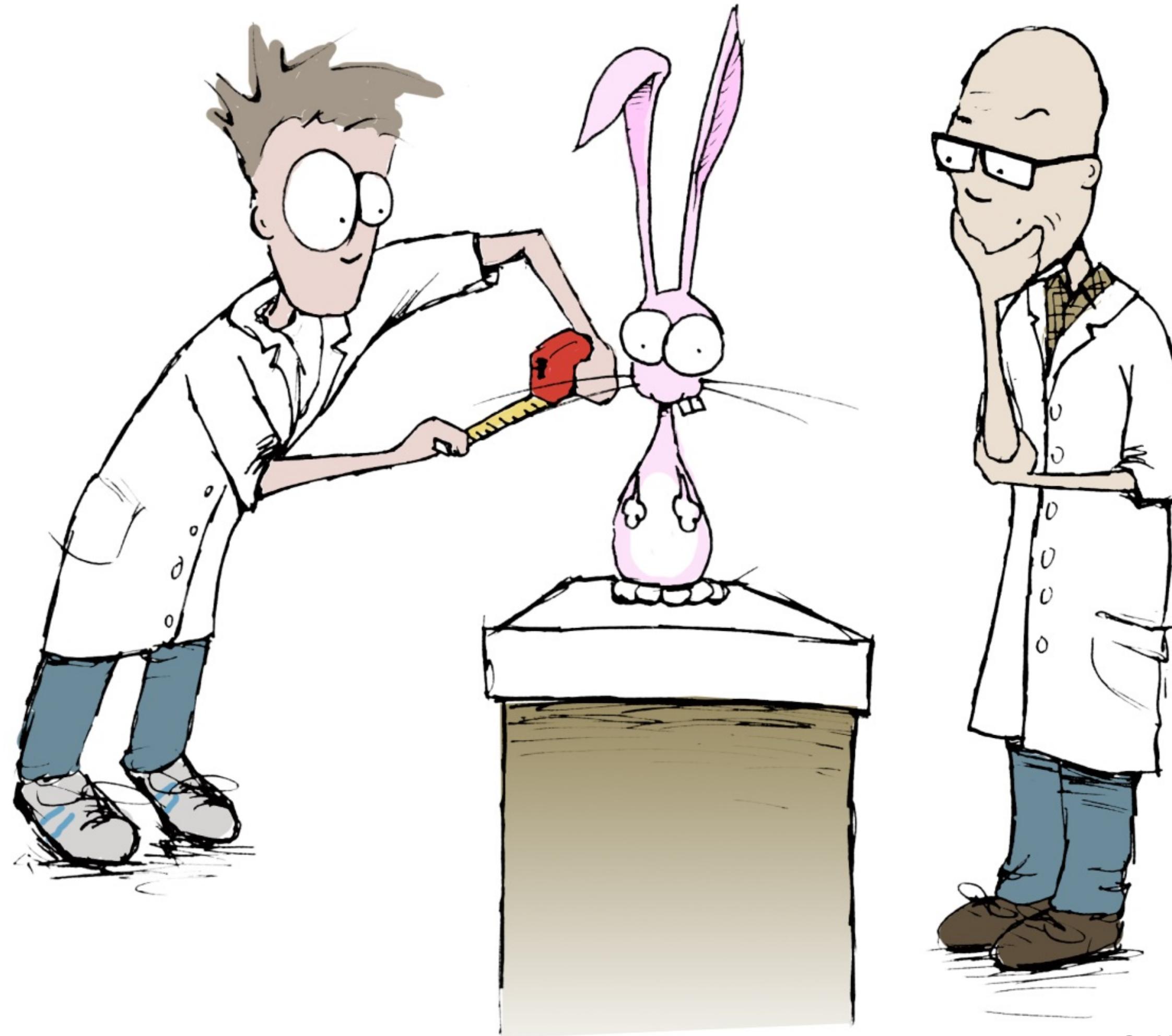## MICB 471 - Laboratory Research in Microbiology and Immunology

Capstone CURE - Course-based Undergraduate Research Experience

- ~50-60 students per term (scaling up to ~80)

- Restricted to students in the Microbiology and Immunology (MBIM) Undergraduate program (Majors, Honours, UBC-BCIT Biotechnology program)

Traditional
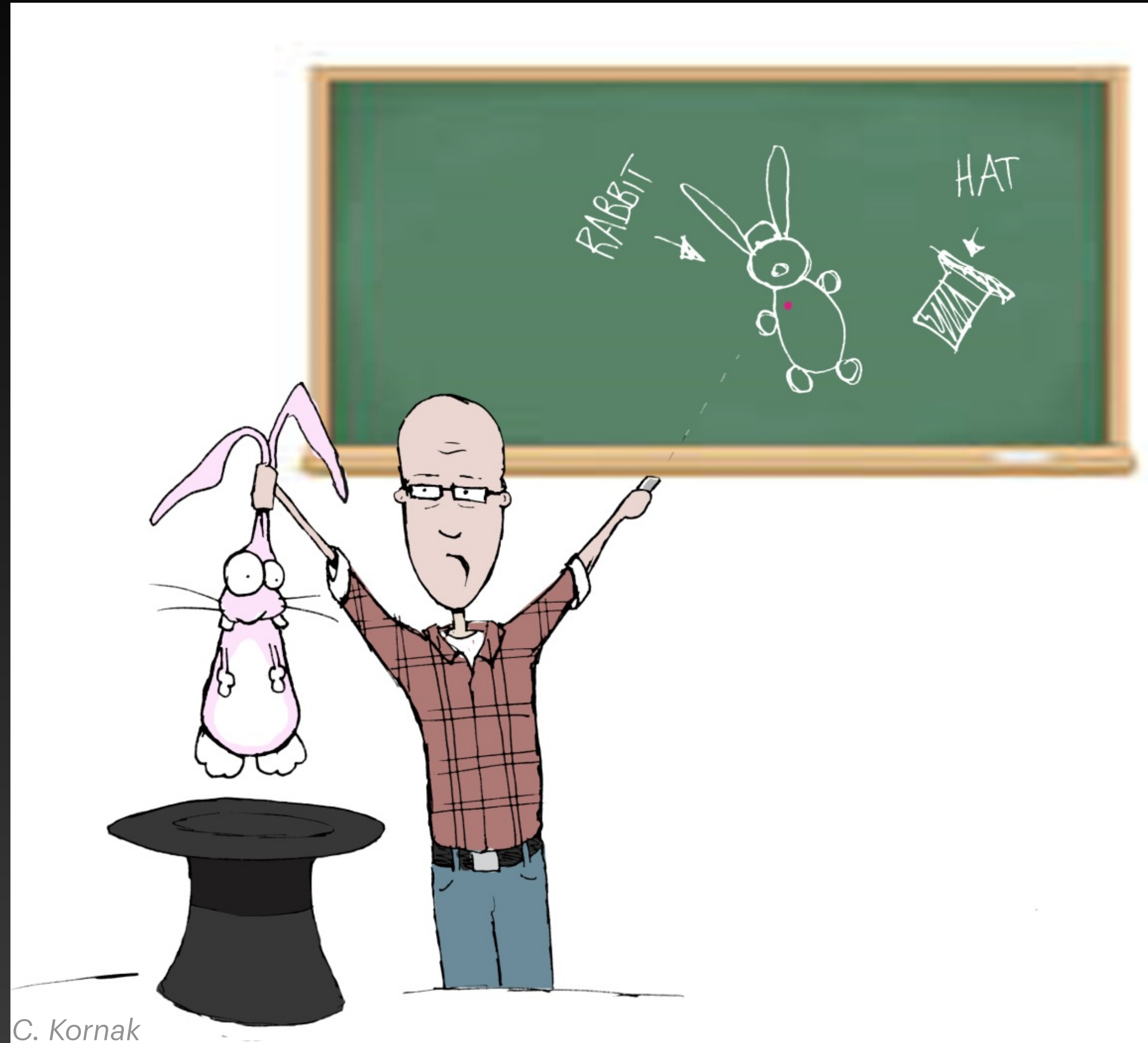
C. Kornak

Directed Studies or Co-op

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Course-based Undergraduate Research Experience

C. Kornak

- Broadly accessible

- Scalable

- Core research skills

Student feedback:

"Fantastic experience but the exams and detailed rubrics seem out of step with the spirit of a research course."

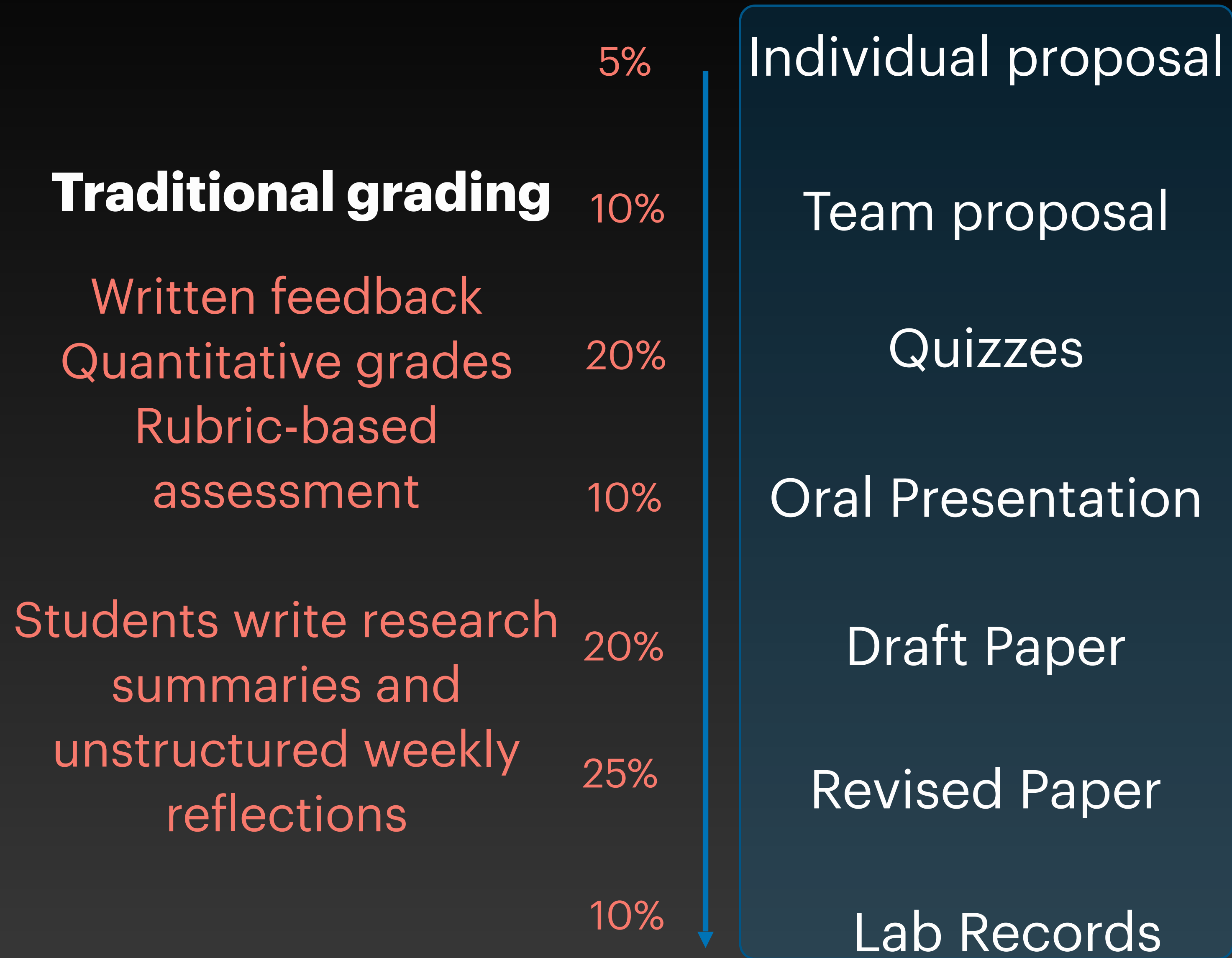Traditional Lab Course

CURE

Grad School Or Industry

Traditional grading vs. Portfolio Assessment Model

Traditional grading

Written feedback
Quantitative grades
Rubric-based assessment

Students write research summaries and unstructured weekly reflections

5%

10%

20%

10%

20%

25%

10%

Individual proposal

Team proposal

Quizzes

Oral Presentation

Draft Paper

Revised Paper

Lab Records

Traditional grading vs. Portfolio Assessment Model

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5%

Individual proposal
Student Reflection

10%

Team proposal
Student Reflection

20%

Quizzes
Student Reflection

10%

Oral Presentation
Student Reflection

20%

Draft Paper
Student Reflection

25%

Revised Paper
Student Reflection

10%

Lab Records

Portfolio-based alternative grading

Written feedback
~~Quantitative grades~~

Students write reflections after each assignment based on feedback from Instructor

End of term
Self-assessment survey
(+/- 4%) Teaching Team Assessment

Portfolio Assessment Model

Teaching team assessment scale:
Good!   Great!   Wow!

Criteria for student self-assessment:

- Assignments were submitted on time via Canvas in the proper format
- Assignment criteria were addressed as per supplied rubrics
- Assignments were of high overall quality (proper formatting, citations, style, rigorous data analysis, appropriate data visualizations, well-edited writing).
- Reflections on assignment feedback were completed and suggestions were enacted in future assignments
- Quizzes were completed on time and reflections explaining incorrect answers were submitted
- Individual attended team meetings and participated
- Individual contributed to teamwork effectively
- Individual worked safely
- Individual was generally a good lab citizen (respectful and collaborative)
- Portfolio was complete and submitted on time

Piloting Portfolio based grading:

- Removing quantitative grades
- Focus on feedback, reflecting on feedback
- Self-assessment

First pilot:

9 students

- 9/9 students wrote positive comments about the alternative grading assessment.
- 1/9 student was overall positive, but shared some anxiety around "not knowing where they stand"

Second pilot (full course)

51 students

- 44/51 students wrote positive comments about the alternative grading in MICB 471
- 5/51 students wrote mixed comments, enjoyed it, but challenging to self-assess
- 2/51 students wrote negative comments, more stressful, too uncertain

End of term Self-assessment Survey:

"I especially love the way this course was structured because I can actually **enjoy the process** of exploring, researching, troubleshooting, without worrying about my grades."

"This was an **amazing experience** in which we didn't have to try to fit our learning method into the way that we're going to be marked."

End of term Self-assessment Survey:

"I found myself **more invested** in my project and more immersed in the material."

"I wanted to do as best as possible to get more inciteful and useful feedback. Because of this, I still **felt very motivated** and engaged with this course even in the absence of quantitative grades."

End of term Self-assessment Survey:

"This method of grading was **much less stressful**, allowing us to focus our efforts on carrying out the project, troubleshooting and improving it, and understanding the material required for development of our project with collaboration with our peers."

"Reduced emphasis on grades shifted the focus on the learning process and **lowered stress**."

End of term Self-assessment Survey:

"I personally enjoyed the non-quantitative metric this course provided as it allowed me to engage with the project more intellectually and **take "intellectual risks"** to pursue X research direction"

Common themes:
Enjoyable
Less stressful
Felt Motivated
Felt free to take risks
Relieved to focus on learning

How students feel matters.

Traditional grading vs. Portfolio Assessment Model

Traditional grading

Class average: 90-93%

5%	Individual proposal
10%	Team proposal
20%	Quizzes
10%	Oral Presentation
20%	Draft Paper
25%	Revised Paper
10%	Lab Records

Traditional grading vs. Portfolio Assessment Model

Traditional grading

Class average: 90-93%

5%   Individual proposal
Student Reflection

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Student Reflection

10%   Oral Presentation
Student Reflection

20%   Draft Paper
Student Reflection

25%   Revised Paper
Student Reflection

10%   Lab Records
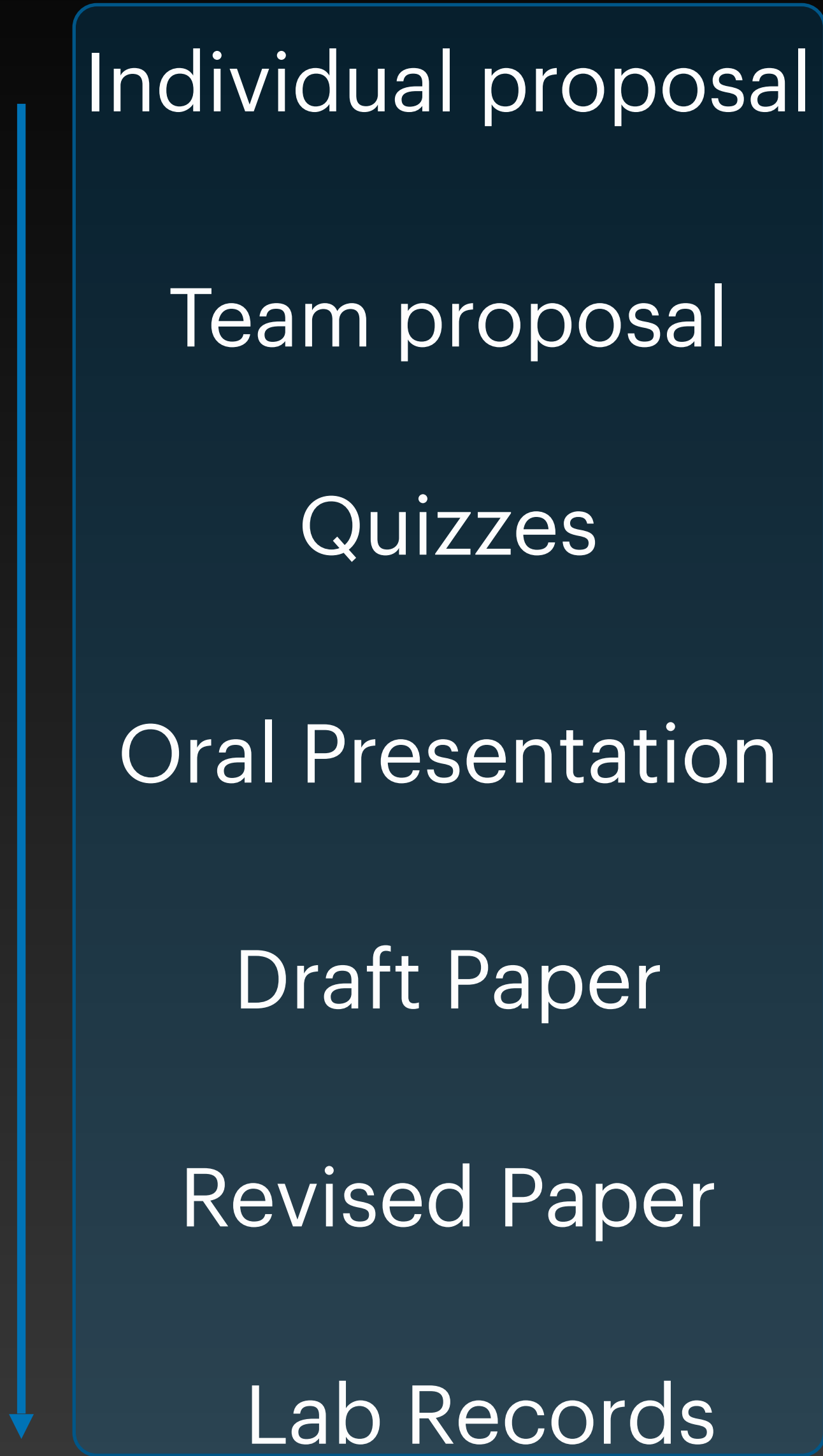
Portfolio-based alternative grading

Class average: 94%

"I really like and enjoy this course. In the other courses that use traditional grading throughout the term, I have never read the comments or answer key. However, for this course I read all the comments and tried to learn from my mistakes."

How students feel matters.

Students:

- Students work just as hard, produce excellent high-quality portfolios

- Self-assessed grades are *similar* to previous traditionally graded courses

- There is a palpable "lightness" in the lab

Teaching team (Instructors and TAs)

- No grades, lecture attendance remains high!

- Allows us to focus on feedback

- More enjoyable to teach!

Next steps:

Tracking student perceptions of our alternative grading model, student behaviours and affect throughout the CURE

To-do's

- Refine student surveys – deploy mid-semester and end of semester surveys

- Measure **CURE domains** in traditionally graded CURE vs. Alternatively graded CURE

  - Scientific practices, Discovery, Collaboration, Iteration, Relevance to scientific community

Challenges:

- Self-assessment is challenging

  - +/- 4% student vs. Teaching team assessment - gaming the grade?

- Learning vs. Effort

Instructor Report:
Mastery Grading/Specs Grading in 2 (very different) programming courses

Introduction

- Introduction to Object Oriented Programming (COSC 1430 - University of Houston)

- ~150 per section

- Second course in the Comp Science pipeline

- Standards-based Grading

- Motivation:

  - Gaps in content (partial credit)

  - Unreliable assignments

- Fairness, Accountability, Transparency and Ethics (FATE) in Data Science (DSCI 430)

- Delivered in W1 for the first time

- 36 students

- 100% Data Science minor students

- Specification Grading

- Motivation:

  - Focus on the content

  - Higher rigour

COSC 1430 Before and After

- 3 in-class exams (weighted 15%, 20% and 20% of the total grade, respectively)

- 8 homework assignments (altogether worth 25% of the total)

- laboratories (10%)

- reading assignments (10%)

- Final grades converted to letter grades, starting at a threshold of 92.5% for A

- Content divided in 13 units

- Grade based on number of units mastered

- Bonuses available for reading and attendance

Units completed	Grade
13	A
12	A-
11	B+
10	B
9	C+
8	C
7	D
6 or less	F

Unit tests for mastery

- Unit tests presented each time different, isomorphic exercises, delivered using the course textbook and platform.

Warning: you MUST use a while loop for points in this exercise

Write a program that takes input from the user a positive integer and outputs all its factors. For instance, if the user inputs

```
100
```

then the program will output

```
1 2 4 5 10 20 25 50 100
```

Hint: you can start from 1 till the input integer to test whether it is divisible by the input integer.

- The exercises were autograded (live). A score of 75/100 or above meant that the student had passed the unit.

- 3 tests available every week (current topic + 2 priors); midterm and final used to provide more chances

Comparison with previous format

- More students proved mastery by the end of the course

- Instructors gained a clearer picture

- We were more demanding in our assessment (no partial credit)

- Evidence of increased intrinsic motivation

- Different unit tests suggest students are not learning to the test

- The fixed number of attempts and the pacing curbs the chances of procrastination, a concern some instructors associate with Mastery Learning. It also limits the workload on the instructors

- Increased flexibility, no complaints/special requests for accommodation

- Programming assignments eliminated in favour of more in class practice —> no plagiarism

- All details available in ITiCSE '23 publication: https://dl.acm.org/doi/abs/10.1145/3587102.3588844

Back to UBC - DSCI 43O

- Course content organized in 6 modules

- Each module is worth 12% of the final grade and is evaluated using an assignment and a quiz (every 2 weeks)

- Also includes a final exam, worth 28%

- Resubmissions allowed for assignments (in limited number)

- Make up day for quizzes on last day of class - can retake up to 2
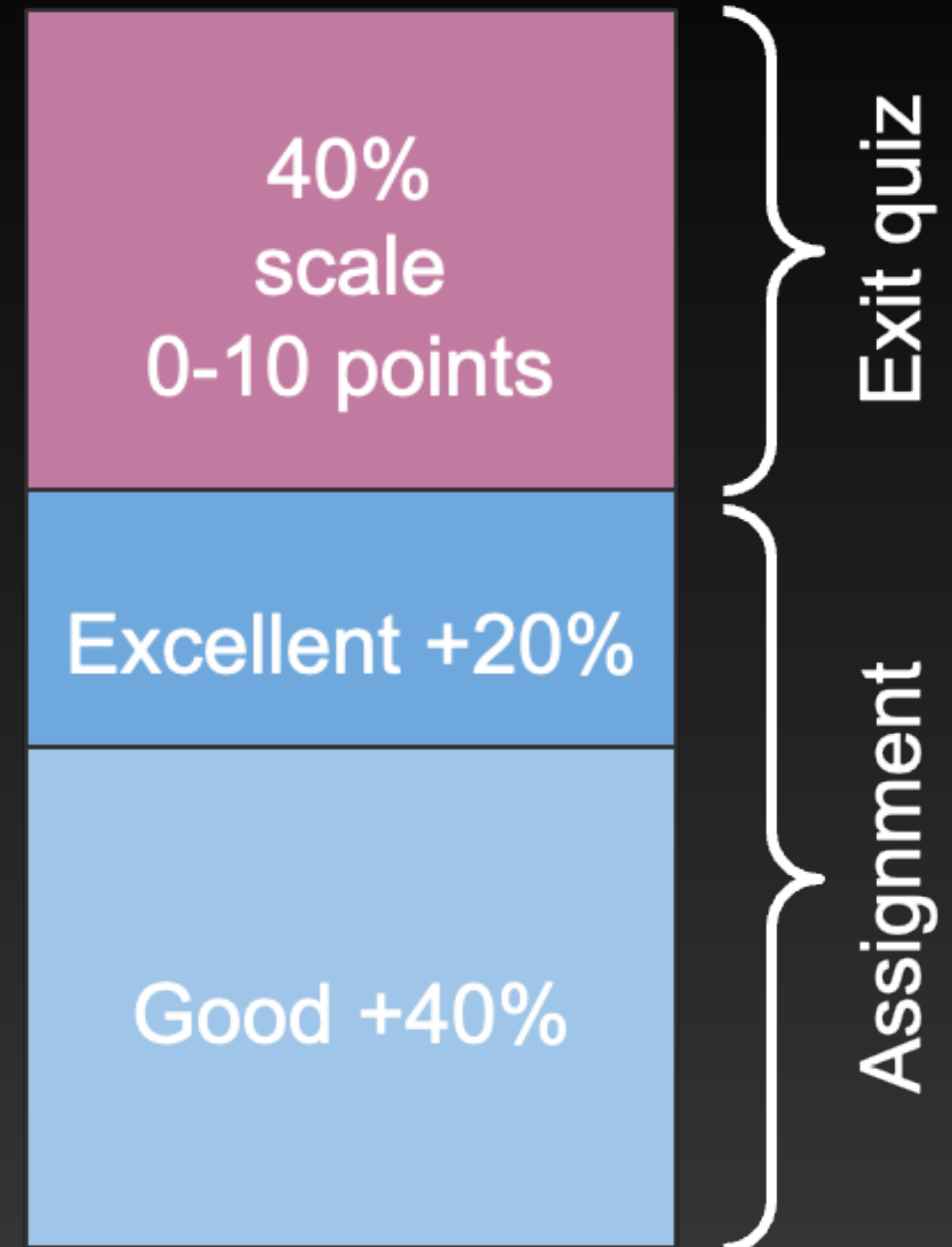
How did it go?

- **The good**
  - Students are engaged and producing high quality material
  - Some of them seem to appreciate and understand the rationale behind the grading system
- **The bad**
  - The resubmission system is too chaotic (we tried to be too flexible with students' groups)
  - Must train TAs to grade in a more nuanced manner
- **The ugly**
  - The grading system does not resonate with some students and they are scared to fail
  - Difficult to report level of proficiency through Canvas

Next time...

- Ideally, move to more authentic specification grading (free of points)

Image credit: https://ticketschool.com/blog/how-handle-traffic-stop-safely/

SoTL Linkage Grant on Alternative Grading

Celeste Leander (Botany), Julia Bullard (School of Information), Jonathan Graves (Economics), Marcia Graves (Microbiology & Immunology), Surita Jhangiani (Education), Firas Moosvi (Computer Science), David Oliver (Microbiology & Immunology), Paul Pickell (Forestry), Giulia Tori (Computer Science)

Join our Slack!

Study 1: Instructor Experiences

- Lit review of existing Alternative Grading Practices

- UBC Faculty Interviews

- A new instrument to capture Alternative Grading Practices (extending the Teaching Practices Inventory)

Study 2: Student Experiences

- Student experiences, attitudes, and perspectives on Alternative Grading

- Focus groups and interviews

- Analytics on student behaviours and habits in Alternatively Graded courses

Study 3: Effect on Learning

- Comparing artifact quality differences in traditionally vs. Alternatively graded courses

- How do students in Alternative Grading systems perform in subsequent courses compared to those completing traditionally graded courses ?

Discussion!