Preliminary results from ungrading in large introductory physics courses
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What is ungrading?
- Ungrading is a philosophy, and a collection of classroom structures.
- Under the larger category of Alternative Grading Strategies.
- Ungrading is de-emphasizing or removing grades as a motivation for learning.
- Emphasize formative feedback.
- Not everyone needs to learn the same thing in the same way!
- Increased flexibility: **logistic** and **epistemic**.

- Motivated by educational equity.
- Lower systemic barriers in formal education.
- Logistic flexibility: variation and choice in course structure, e.g. due dates, means of participation, assignment formats, etc. Allows students to balance school and life.
- Epistemic flexibility: variation and choice in course content or assignment topics. Allows students to connect to physics, build interest, and develop an integrated physics identity.

More established in K-12 settings, gaining traction in higher education STEM.

Course and Institutional Context
- Several professors at WPI have formed a community to explore ungrading in their classes.
- WPI is an engineering school, so most are STEM classes. Some are humanities and arts, which also exist at WPI.
- Range from large intro courses to upper-division undergraduate core classes and electives.
- The community has institutional support (financial, publicity, etc.).
- My intro physics courses are completely ungraded since Spring 2022.

Epistemic flexibility: 

- Newtonian mechanics for non-physics STEM majors.
- 80-100 students. Mostly first and second years.
- Studio-style classroom.

Approach to evaluation
- I didn’t change much from past terms.
- (half) flipped classroom: recorded lectures at home, active engagement review and group problem solving in class.
- Homework assignments with due dates, students can check answers online in real-time, posted solutions after due.
- Regular quizzes / “check-ins,” returned with only formative feedback.
- Group project at end of course.
- Students set their own goals, final grade based on self-evaluation.

Preliminary quantitative measures of learning
- Most students agreed to ungrading. A fantastic final project.

Results: a Preliminary Picture

- Petkie interviewed students in ungraded classes and professors who taught those classes.
- Inductive analysis to identify emergent themes in bolded topics above: benefits and improvements.
- Motivation to learn more and dive deeper.
- ...yet motivation from numerical grades was lacking.
- Learning at own pace/style is fairer to all students.
- ...yet concerns about not learning as much felt unfair for future preparation.
- Lowered stress greatly helped emotional/mental health.
- ...yet some students found adjusting to ungrading stressful.

Methodology
- Approach to evaluation
  - Students set their own goals at the start of the course
  - They reflected on those goals periodically
  - At the end, they assigned themselves a grade
  - I reviewed those grades, and agreed in almost all cases
  - In rare cases of disagreement, I asked for more info via email and followed up as necessary. Results in further growth.

- Course structure
  - Added framing in my syllabus and intro in the first class
  - Dedicated a class period to metacognition
  - Dedicated two class periods to self-reflection activities.
  - (Class is only 7 weeks long... WPI is weird that way)
  - Quiz feedback was entirely formative. No points.

- Research projects
  - Petkie undergrad thesis: interviewed students and instructors about perspectives on ungrading.
  - MacGregor undergrad thesis: interviewed students about groupwork and group dynamics in ungraded classes.

- MacGregor interviewed students in ungraded classes.
  - Semi-structured interviews on how ungrading influenced group dynamics in group project settings.
  - Mixed deductive/inductive analysis along three thematic categories: motivation, mental health, and identity-mediated group dynamics.

- Students gave each other formative feedback on their work.
  - Quiz feedback was entirely formative. No points.

- moderation by the group members.
  - Students in ungraded classes.
  - Students in graded classes.

- MacGregor interviewed students in ungraded classes.
  - High frequency of negative comments from students in graded classes.
  - Students in ungraded classes.

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- Key findings:
  - Regarding identity, ungrading put everyone on an even playing field, creating equality among group members.
  - Regarding motivation, ungrading mitigates the negative effects of unmotivated team members.

- Self Evaluation
  - At the end, they assigned themselves a grade.
  - They reflected on those goals periodically.
  - Students set their own goals at the start of the course.

- Final Project
  - A fantastic final project.
  - Dedicated two class periods to self-reflection activities.

- Results in further growth.

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