



Utilizing ungrading approaches to encourage intrinsic motivation in a molecular biology laboratory course

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Extended Abstract

Objective

Ungrading is an educational approach focused on shifting student focus away from earning points and toward intrinsic motivation (Blum 2020, Strommel 2020). By removing traditional grading systems and instead centering on learning goals, feedback, and self-reflection, students are encouraged to focus on the learning process and the joy of discovery. This sounds exactly like a mission statement for laboratory courses, but how do we do it?

Implementation

Our upper division laboratory course (class size = 10-15 students) is designed to mimic how professional researchers perform molecular biology, with novel research questions that could generate publishable results (O'Brien & Kruchten, 2023). All course assignments are actual professional research activities, including maintaining laboratory notebooks, designing figures and presenting research posters. I wanted our learning assessments to also model how we evaluate performance in our field. Therefore, I utilized two ungrading techniques: instructor feedback without points and reflective essays focused on learning goals.

Feedback/No Points

Previous research indicates that task-based instructor feedback only, not associated with points, can increase student interest and performance (Butler, 1988). In our course, after each experiment, students created figures with captions to describe their design, technique and results - and received only comments from the instructor, no points. Students were encouraged to use this feedback as they incorporated their figures/captions into their final research poster.

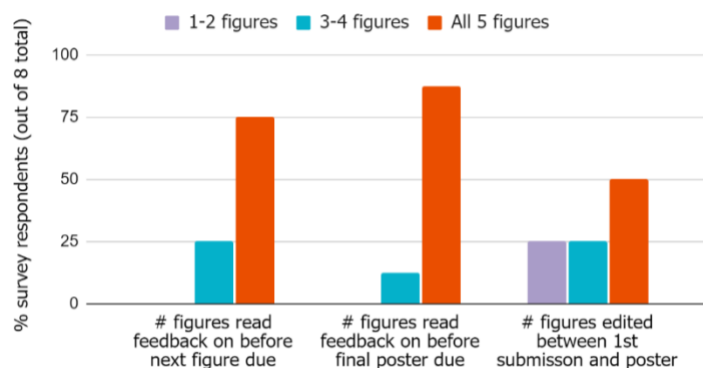


Figure 1. Based on survey data (n=8 students), most students read feedback before their next figure assignment was due and/or before their final poster was turned in. Further, all students edited figures between first and final submission.

How did the experience of receiving only instructor feedback and no points affect your course experience?

8/8 student responses were completely positive:

- “It reduced pressure of doing assignments perfectly and motivated me to change things on the next assignment.”
- “It was great, it made everything less stressful so I could focus my energy on technique and getting it right instead of my grade.”
- “It helps me focus more on actually learning the materials on the assignment rather than just following rubrics and guidelines just to get the best grade.”
- “I have found that while working on the assignments, I was more focused on understanding the content so I could feel more comfortable in class rather than memorizing terms and patterns to transfer on to an assignment for points. It has made my lab confidence higher as hearing feedback instead of a point number allowed me to know what to change next time. I was also less intimidated of O’Brien as I saw her feedback as her trying to really help me rather than just a grading of what I did.”
- “I really enjoyed the course not having a grade for each assignment. It relieved the pressure of knowing that each thing will be awarded a specific grade. I liked to have your cumulative effort and work reflect a grade, not just a specific assignment or test.
- “I felt less stressed while completing the assignments when I was not sure if my understanding was completely correct. I felt like I was able to learn more from my mistakes.”
- “It was great because it relieved a big pressure that college students have in their college courses.” • “Not being pressured to complete work based on strict grading guidelines allowed me to approach the coursework with an open mind. I spent less time feeling stressed about grades and more time focusing on what was expected of me.”

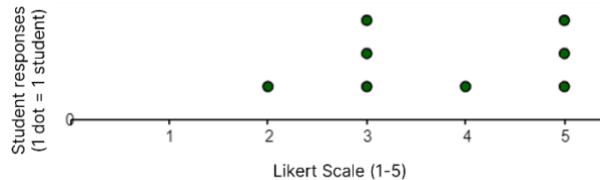


Figure 2. How did the experience of receiving only instructor feedback and no points influence your motivation to complete coursework? Likert Scale: 1 = much less motivated than when you also receive a point score, 2 = a bit less motivated than when you also receive a point score, 3 = same amount motivated as when you also receive a point score, 4 = a bit more motivated than when you also receive a point score, 5 = much more motivated than when you also receive a point score, n=8 students.

Reflective Essays

The reflective essays are structured similarly to the case statement many researchers write as part of their promotion/tenure process. Here, students practiced metacognition as a way to build intrinsic motivation. Students stated their case for their progress on course objectives by citing their own evidence and provided an explanation of the letter grade they thought they earned in the course.

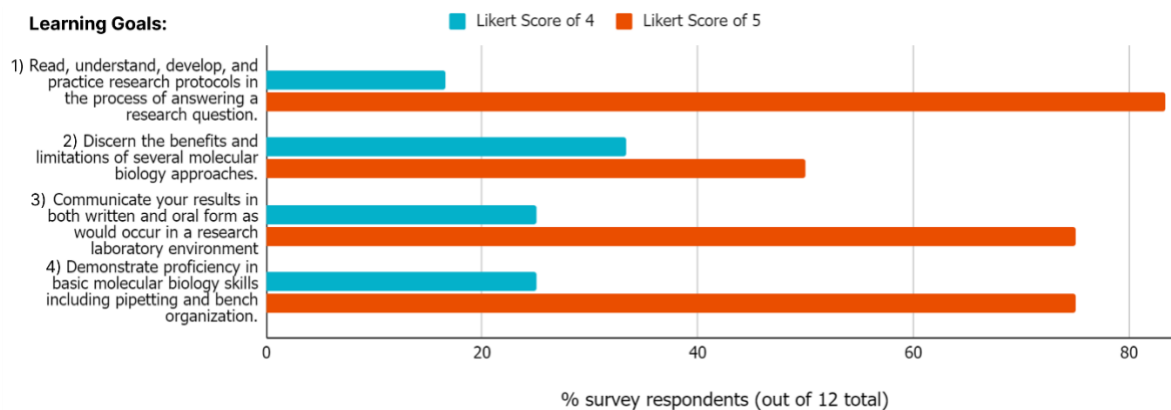


Figure 3. All students (n=12) reported a Likert Scale Score of 4 (blue) or 5 (orange) to describe the extent the course helped with achievement of each of four Learning Goals (Likert Scale: 1 = fell way too short, 3 = acceptable, 5 = great improvement).

How did the experience of stating your case and/or explaining your grade affect your course experience?

Student responses curated to reflect overall trends:

- “Stating my case completed the full circle of course objectives that were communicated on the first day of class. Those objectives had a purpose throughout the whole semester rather than just being stated and forgotten on the first day.”
- “I think it challenges me to not be hard on myself and communicate where I think I am at in the learning process.”
- “It was helpful because in most courses we just have to rely on our grades regardless of circumstances that hindered or helped our time commitments in school. With our case statement we were able to defend the progress we made as well as explain ourselves, which was greatly appreciated.”
- “I don't have to worry about not doing as good as my peers, just doing better than I started with at the beginning of the semester.”
- “Advocating for myself has always been something I have not been too good at. After writing about the visible progress I have made, it was easier for me to advocate for a higher letter grade for myself. I think it is important to complete assignments that can feel a bit uncomfortable because they can only lead to growth.”

Frequently Asked Questions (FAQs)

The following questions were asked by ABLE participants during the poster session.

- 1) What happened to the class averages after implementing the ungrading approach?
There was no significant difference ($p=0.11$) in overall course letter grades, using a 4.0 Grade Point Average (GPA) scale, when comparing the class averages from five semesters before these ungrading approaches were utilized to the class averages from two semesters after implementation.
- 2) How was the experience from the Instructor Point-of-View? Did you find it more/less work? More/less rewarding?
The “instructor feedback without points” experience was definitely less work and more rewarding. As I already provided written instructor feedback on these assignments previously with similar class sizes, the primary change was simply to not assign points. While writing the feedback, I found it to be much less mentally taxing, as I did not have to think about how many points were lost or how to consistently assign points across students when slightly different mistakes were made. I also did not have to write explanations about why points were lost and worry about doing so in an understandable and constructive way. Instead, I could just focus on describing what was done well and what needed improvement. Not only did this save time, it felt more like a professional mentoring interaction rather than placing a numerical judgement or policing adherence to a rubric.
The “reflective essays” experience required less time to assess than a traditional essay, as no points were assigned or corrective feedback needed to be made. The essays were quite enjoyable to read, in part because no ‘grading’ needed to be done and also as a way to get insight into how our students think and reflect on their experiences.
- 3) How were final course grades ultimately assigned?
For this course, the overall course grade that students stated and explained why they earned in their reflective essay was the grade assigned, unless there was significant variation from instructor observation. In reality, I only adjusted one out of twenty total grades, and this was to increase the grade from what the student stated they earned. Students were quite accurate in assessing how well they met course objectives and honest in their reflections.

- 4) What did you do if students awarded themselves a lower grade than you would have, and how did you navigate that discussion?

In the one case where this occurred, the student had justified their grade by noting that several assignments were turned in late. We had a conversation about what this course's objectives were explicitly, and how none of them were focused on time. I emphasized that meeting deadlines is a useful habit, and that recognizing this was something they needed to work on would help them in the future. Then I highlighted that the student met each objective well and that's what this overall course grade was meant to reflect.

CITED REFERENCES

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