THE IMPACT OF UNGRADING ON SECONDARY SCIENCE LEARNING

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INTRODUCTION TO THE RESEARCH

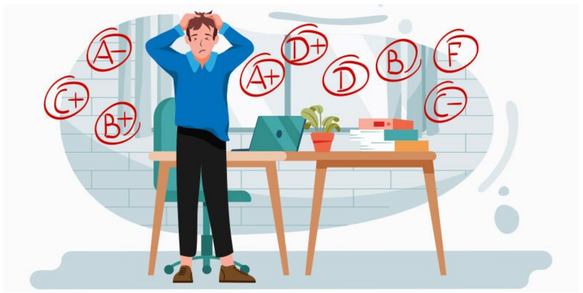
Traditional grading systems dominate science education, yet they often suppress curiosity, increase anxiety, and reinforce inequities. "Ungrading" is a growing movement to reimagine assessment through feedback, reflection, and student-centered practices. As a future high school Earth and Environmental Science teacher, I explore how ungrading aligns with inquiry-based science and supports student agency and equity

TOPIC FOCUS

Ungrading is a pedagogical approach that shifts the emphasis from numerical grades to formative feedback and self-assessment. This study connects ungrading to Washington State's TPEP framework by promoting student-centered learning, fostering a growth mindset, and supporting culturally responsive practice. In science classrooms, ungrading opens space for curiosity and scientific thinking over performance pressure.

HIGHLIGHTED FACTS WOULD GO HERE

- **Motivation and Learning**: Butler & Nisan (1986) and Lipnevich & Smith (2009) show that students perform better when given feedback without grades.
- **Teacher Experiences**: Case studies (Blum, 2020; Sackstein, 2020) reveal how ungrading deepens relationships, increases student reflection, and promotes authentic engagement.
- **STEM-Specific Findings**: In general education science courses, ungrading increased participation and supported collaborative learning.
- **Student Perceptions**: Students often prefer feedback over grades when given a choice, particularly when grades induce anxiety or competition.
- **Hybrid Approaches**: Standards-based grading and portfolio assessment provide structure while supporting ungrading's core goals.
- **Implementation Models**: Ungrading strategies include narrative feedback, token-based reassessments, and co-created grading conferences.



INQUIRY QUESTIONS

How does ungrading affect student learning, motivation, and engagement in science classrooms?

What are the challenges of implementing ungrading in high school Earth and Environmental Science?

How can ungrading support equitable and inclusive science instruction?

THEORETICAL FRAMEWORK

Ungrading aligns with constructivist learning theory (Piaget, Vygotsky), self-determination theory (Deci & Ryan), and culturally responsive pedagogy (Hammond). These theories emphasize learner agency, intrinsic motivation, and social interaction—all of which are nurtured by ungrading.

RATIONAL

I'm pursuing this research as a future Earth and AP Environmental Science teacher in a rural school. I've seen how traditional grading can discourage risk-taking and creative thinking. Ungrading resonates with my desire to foster scientific literacy and empower all students, especially those historically marginalized in STEM. I want to create a classroom culture focused on learning, not compliance.

EQUITY LENS

Traditional grading often punishes students for factors beyond their control and favors students with dominant cultural capital. Ungrading, especially in science, opens opportunities for reflection, revision, and personalized growth. It de-centers compliance and supports diverse learners through equitable feedback practices.

REFERENCES

ACTION PLAN

Students will be assessed on NGSS-aligned learning targets..

Formative Feedback: Daily work and early drafts will receive descriptive feedback instead of points. Students will revise based on feedback to show growth.

Portfolios & Self-Reflection: Students will maintain portfolios with selected work and written reflections to document progress.

Conferences: Mid- and end-of-term grade conferences will invite students to self-assess and reflect on their learning journey.

AP Course Alignment: In AP Environmental Science, I'll maintain exposure to AP formats while providing ungraded practice and iterative feedback.

CHALLENGES

Student Anxiety & Habits: Many students are conditioned to work for grades, not feedback. Without a clear point system, some may feel lost, especially high-achievers concerned about college admissions.

Time & Workload: Ungrading often requires more individualized feedback, student conferences, and reassessment opportunities. For teachers managing large class loads or lab-heavy courses, this can lead to burnout without strong planning and boundaries.

Policy & Transcript Pressures: Schools and districts still require traditional grade reporting. Teachers using ungrading must often find hybrid systems that allow for institutional compliance while staying true to the philosophy.

Equity Risks if Poorly Designed: If learning targets are vague or feedback is inconsistent, students, especially those needing more structure, may disengage. Ungrading must be clear, accessible, and culturally responsive to be equitable.

Colleague & Parent Pushback: Some colleagues may see ungrading as lacking rigor. Parents may worry it will harm their child's GPA or college prospects. These concerns require proactive communication and transparency.