

Alternative Grading in Clinical Laboratory Sciences Education: Students' Perspectives

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ABSTRACT

INTRODUCTION: Ungrading, or alternative grading, can be used to decrease stress and focus on grades while increasing learning. While ungrading in higher education is gaining attention, it is relatively unfamiliar in health professions education.

METHODS: This study implemented alternative grading in 3 clinical laboratory sciences courses and observed student perspectives of the practice. Surveys with closed- and open-ended questions were administered after course completion. Nineteen responses were received on the questionnaire. Similarly, 19 students provided reflections on the grading practices through course assignments, which were included as qualitative data for this study.

RESULTS: Students reported positive experiences with less stress and better focus on their learning. Most students did not have previous experience with alternative grading but expressed they felt it was appropriate for their courses.

CONCLUSIONS: Alternative grading had a favorable impact in these courses, suggesting that these practices may be beneficial in other courses.

ABBREVIATIONS: CLS - clinical laboratory science, DCLS - doctorate in clinical laboratory science, IRB - Institutional Review Board, MLS - medical laboratory science

INDEX TERMS: medical laboratory science, educational measurement, learning, teaching, education.

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INTRODUCTION

Grading is commonplace throughout all levels and fields of education. Grades are often provided in the form of

letters or percentages, and the letter grade and 100-point percentage scale that educators and students are familiar with today were introduced not long ago in the early 1900s.^{1,2} These letters and percentages are often used as a way to represent students' knowledge, performance in a course, and content mastery. Health science programs often rely on grades as a predictor of success on board and licensure exams that graduates will take before entering the workforce. Interestingly, grading was initially introduced into education to standardize and communicate between schools, yet standardization between organizations is lacking as evidenced by the varying grading scales published on academic institutions' web pages. The lack of standardization should raise concerns among educators, as we can presume inherent inequities and inaccessibility would arise from such inconsistencies. Therefore, the reliability of grades as a communication tool and predictor of success for post-graduation certifying exams is questionable.

The issue of accessibility and inequity stems even deeper than the lack of standardization between academic institutions. Grading practices are inequitable and often include factors that are unreliable measures of knowledge, such as behavioral factors.³⁻⁷ Although grading practices may include factors unrelated to knowledge, academic programs often rely on grading to assess students' intellect and performance in class. These grading systems do not consider the starting point of individual students but rather treat each student as the same with uniform expectations regardless of their previous academic experiences. Additionally, many instructors have implicit biases that can impact students' grades.³

Compounding the issues of inequity and inaccessibility, grading can lead to negative effects on the student and inhibit the learning process.⁸⁻¹² These effects contradict the goal many educators share: to instill knowledge that will benefit the students in their personal and professional lives. Thus, alternative assessment approaches (eg, *ungrading* or *alternative grading*) have become more popular, especially in the wake of the COVID-19 pandemic. Despite the growing popularity of alternative grading, educators feel pressure to use the 100-point percentage scale and letter grades because of institutional requirements and other factors. Health professions educators, in particular, need to ensure their students are competent enough to perform job tasks without risking any harm to the patient. To assess competence, health professions often have certifying or licensure exams that must be passed before an individual is allowed to practice.

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Naturally, educators use grading as a way to assess students' readiness and ability to pass these exams.

The combination of the negative effects of grading and the pressure to prepare students for certifying or licensure exams places health professions educators in an interesting situation. We need to promote learning but also ensure that students are prepared to pass the certifying or licensure exams, and more importantly, provide safe and reliable patient care. It is understandable that health professions educators might have an interest in implementing alternative assessment approaches but remain skeptical of their utility in health professions education. Therefore, the purpose of this study was to explore the utility and impact of alternative assessment approaches in various clinical laboratory science (CLS) courses.

BACKGROUND

Grading Side Effects

Traditional grading has been shown to have many negative side effects on students ranging from impacting mental health to affecting motivation, choices of courses, and more. Grading decreases internal motivation and increases gamification and competition between students.⁸⁻¹² Grading can also impact students' sense of self-worth.¹³ These impacts place limitations on students that may have a lifelong impact.

MENTAL HEALTH

Undergraduate and graduate students report high levels of anxiety, depression, and other mental health disorders, and this rate appears to have increased over time.¹⁴ A contributing factor to these issues is academic stress. Academic stress, such as stress related to poor grades, may contribute not only to mental health disorders such as depression and anxiety but also to substance use, sleep issues, and even a student's physical health.¹⁵ As these issues increase in prevalence, it is increasingly important to consider ways to combat student stress and its associated negative outcomes. One way to do this may be to use alternative assessment methods. Traditional grading scales have been shown to increase student stress and anxiety across a variety of majors and education levels.¹⁶⁻¹⁸ Alternative assessments provide a way to reduce this burden. One study in medical students showed that students assessed on a pass/fail system reported less stress and better cooperation with their peers.¹⁹ Another school implemented a reduced number of grading levels as a part of an overall wellness program designed to reduce stress and competition among medical students.²⁰ A gradeless approach will also likely benefit undergraduates in this area.

McMorran et al surveyed undergraduate students at a university in which the first year is gradeless.²¹ In an open-ended question about what they thought the benefits of

this gradeless year would be, 36% of all respondents responded that they thought that stress would be reduced using this system.²¹ As alternative assessments are increasingly implemented, it will be important to study how this impacts the mental health of students.

MOTIVATION AND LEARNING

One of the most touted benefits of a traditional grading system is its ability to motivate students to learn. This makes many instructors and institutions hesitant to adopt alternative grading practices. However, the evidence for this supposed benefit is lacking, and there are potential consequences to using this external motivation source as a means of enhancing student learning. On one hand, there are several studies that suggest that traditional grades can be linked to more motivated students and increased professional success. For example, one study found that students at the boundary between a B and a C on the first test in a course were more likely to achieve a higher score on the subsequent test.²² The authors suggest that this shows increased motivation as the result of a letter grade. However, this study does not demonstrate if there is any long-term benefit for learning. Another study found that when accounting courses used a stricter grading scale, the results of grades in the course more closely lined up with success on professional exams.²³ The authors suggest that this provides evidence that stricter grading scales are a greater source of motivation for students; however, alternative explanations should also be explored. While professional examinations are only a single measure of professional success, this evidence should be considered in other fields in which such exams exist, such as in the health professions. However, evidence to the contrary has also been found. For example, one study on medical students found that in a pass/fail system, there was no difference in external measures of student success such as professional exams and residency placement.²⁴ The authors further suggest that this pass/fail system better lays the foundation for self-regulated and long-term learning, which is key for long-standing professional success. Indeed, there is evidence that shows that external motivation, such as that provided by grades, does not enhance learning or motivation in the long term and may actually distract students from deeper learning.¹⁶ Students in traditionally graded coursework have reported that their grades are more important to them than learning.^{17,25} This is clearly at odds with the ultimate goals of higher education and thus changes should be strongly considered.

CHOICE OF MAJOR OR COURSES

Another concern with traditional grading approaches is that it may lead capable students to change from more difficult majors to easier ones or to avoid beneficial but

difficult courses as a means to preserve GPA. This is of particular concern in STEM fields as uneven grading practices are often seen between STEM and non-STEM fields, with grades in STEM courses generally trending lower.^{26,27} Indeed, several studies have suggested that higher grades in major courses are associated with greater persistence in a major, while lower grades in major subject courses can lead a student to change majors.^{28,29} However, this effect may not be seen across all majors and may affect certain groups of students differently. For example, in one study of economics students, final letter grade in a course was not found to have an influence on a student's decision to change majors.²² Another study found that female students were more likely to major in economics based on a final course grade of "A" in an entry economics class, but this was not seen in male students.³⁰ Grading systems can even influence students at the course or instructor level. This was acutely shown in the results of several survey studies, with responding students reporting that they avoid courses and instructors that they feel may negatively impact their GPA and that they generally value getting an "A" in a course over taking a challenging course.^{16,25}

This has obvious potential impacts on student learning and intellectual growth. Although there is an inadequate amount of research in this area, alternative grading systems provide a potential means to retain qualified students in difficult majors. One study showed that a successful/unsuccessful grading system in an engineering department led to greater student retention.³¹ At another university in which students can participate in a first semester without grades, surveyed students reported feeling that the gradeless approach would allow them greater opportunity to take academic risks.²¹ Students' focus on grades has the potential to undermine their self-confidence and drive them away from fields in which they could ultimately be successful; alternative assessment approaches have the potential to lessen this behavior.

CHEATING AND OTHER NEGATIVE STUDENT BEHAVIORS

There is also some evidence to suggest that negative student behaviors such as cheating and "grade-grubbing" may be encouraged by letter grading systems. This may have important consequences such as failing to detect students who do not understand course material, grade inflation, and students receiving unequal treatment. It has been shown by studies across several decades that students cite the importance of grades as a reason to cheat on their coursework.³²⁻³⁴ This behavior appears to be more pronounced in students who have lower course grades or GPA.^{33,35} If the student is able to get away with cheating or if the consequences for cheating are minimal, this may result in a student with a poor understanding of course material moving on to more advanced courses for which they are not prepared. More study is needed, but

anecdotally alternative means of assessing student knowledge may discourage student cheating.³⁶

Another problematic student behavior is "grade-grubbing" or when a student pressures an instructor to give them points on an assignment that they potentially did not earn. Surveys have reported increased incidences of grade-focused interactions between students and instructors in recent years.^{25,37} These interactions may not be beneficial to student learning if the primary goal is to receive points and not to clear up misunderstandings. This also has the potential to lead to unfairness in a course if an instructor agrees to change the grade of only the grade-negotiating students. Alternative assessments have the potential to make student-instructor interactions more beneficial to learning, with one instructor reporting fewer instances of grade-grubbing and more discussion of ways to improve student work in student meetings.³⁸

Assessment in Health Professions Education

Ungrading is not a new concept, and several educators have implemented it, yet there appears to be limited use or knowledge of it in health professions education. A literature search for ungrading or alternative grading in health professions education will yield few results. However, many elite medical schools use pass/fail grading, while only 12 medical schools used the traditional letter grade scale or numerical grades for preclerkship courses in the 2021–2022 academic year.^{39,40} Interestingly, the number of medical schools using limited grading (eg, pass/fail) has been steadily increasing, and the number of medical schools using numerical, or letter grading has steadily been decreasing since 2017.⁴⁰ Despite these trends in medical schools, many other health professions often focus on minimum grades. Yet again, information available on these trends is limited. Further research needs to be done to better understand grading practices and the use of alternative assessments and ungrading in health professions education.

METHODS

Qualitative and quantitative methods were used to evaluate the impacts of ungrading on student performance and perspectives of growth in 3 CLS classes in the Fall of 2022. This study evaluated the use of ungrading in 2 undergraduate medical laboratory science (MLS) courses and 1 doctorate in CLS (DCLS) course. Additionally, this study aimed to explore students' achievement of course objectives when compared to a previous, traditionally graded course. This study addressed the following research question:

What impact does ungrading have on students' reported learning and growth in CLS courses?

Additionally, this study explored the following secondary research question:

How do students rate the appropriateness of ungrading?

Alternative assessment approaches were implemented in the 3 courses in the Fall of 2022, including limited grading, grade-free zones, and self-assessments. This study implemented both qualitative and quantitative methods. However, the study population was too small to provide reliable statistics and therefore was approached as an exploratory study. A supplemental questionnaire was provided to students after they completed all course requirements, and their grades were documented with the university. The questionnaire included open- and closed-ended questions that were analyzed qualitatively and quantitatively, respectively. Learning activities that were completed as part of the course were also qualitatively analyzed.

Ethical Considerations

This study was performed as a quality assessment/quality improvement project approved by the Institutional Review Board (IRB). Course activities used in this study were part of the original course design, and additional surveys used were approved by the IRB before administration. Additional surveys were anonymous, voluntary, and administered after course completion and final grades were submitted to the registrar.

Ungrading vs Alternative Grading

It is important to note that ungrading and alternative grading, or alternative assessment approaches, are not the same thing. Ungrading is actually one type of alternative grading. For the purposes of this study, however, the terms will be used interchangeably as various alternative grading techniques were implemented in the studied courses.

Course Structures

The application of ungrading was evaluated in 3 CLS courses. Two of the courses are foundational-level undergraduate courses that students take in the first semester of the MLS program. The third course is an introductory research methods course, typically taken during the first semester of the DCLS program.

UNDERGRADUATE COURSES

Both undergraduate courses are taken by MLS students during the first semester of the program. The first course is phlebotomy, which is required for all students who do not work as phlebotomists. The course covers the theory of blood collection, the practical skills required to successfully perform blood collection procedures, and a 2-day

clinical experience in an outpatient phlebotomy setting. The other course is a fundamentals course that introduces the analytical techniques used in a clinical laboratory, quality control, basic laboratory operations, and urinalysis. Both undergraduate courses have didactic and laboratory components.

ALTERNATIVE APPROACHES

The undergraduate fundamentals course contained some components that were graded on a traditional grading scale and other components that were assessed for comprehension and graded on a complete/incomplete basis. Tests and laboratory practical exams were graded based on a traditional grading scale. Laboratory assignments and prelab quizzes were graded as complete/incomplete with complete meaning that the student received full credit, while an incomplete resulted in no credit. On the prelab quizzes a student needed to answer 70% of the questions correctly in order to participate in laboratory activities for the week. If this was attained, then the quiz was marked as complete; if this was not attained, the student was encouraged to ask questions and retake the quiz until a 70% was achieved. In addition, the students had weekly laboratory assignments that were assessed for completeness as well as student comprehension. Written feedback was provided to students on each assignment. If the assignment was not fully complete, it was marked as incomplete. If the instructor felt that there were major errors in the assignment or that the student did not understand the assignment, written feedback was provided to the student, and the student was asked to redo the assignment or submit an additional assignment in order to achieve credit.

The phlebotomy course was assessed with a competency exam, student memos, clinical preceptor evaluations, and self-evaluations. The only graded item in the course was the competency exam, and students were required to achieve at least a 70% on the exam. Students were evaluated on their skills and professionalism during clinical. They were required to receive adequate evaluations from their preceptors, with no more than 1 “needs improvement” or “does not meet expectations” marked (Appendix A). Student memos were marked as complete or incomplete. Lastly, students were required to evaluate themselves. A rubric was provided that outlined the course objectives and provided prompts to address (Appendix B). With this self-evaluation, students could reflect on what they learned and how they applied that knowledge to practical skills. They also assigned themselves a course grade. Given that all other requirements in the course were met, the self-assigned grade was the final grade submitted to the University.

The syllabus, however, did have a disclaimer that grades may be raised or lowered if the instructor disagreed with the self-assessment. The instructor would meet with

the students in this case before assigning a different grade, but there were no incidents of grade disagreement.

GRADUATE COURSE

The DCLS course included in this study is an introductory research methods course in the DCLS program. It is a 2-credit course required for the DCLS and is typically completed in the first semester of the program. Before ungrading the course in 2022, it was graded using point values on individual assignments that were separated into weighted categories to determine the overall course grade. In the Fall of 2022, the course was ungraded and utilized a variety of alternative assessment approaches.

ALTERNATIVE APPROACHES

Grade-free zones were implemented, and learning activities were classified as optional or required. Optional learning activities included module memos, discussion boards, and article critiques. Required learning activities were research papers in parts, a research proposal presentation, and an IRB protocol. Submissions for all of the required assignments were necessary to pass the course. All learning activities were assessed as complete or incomplete, with an emphasis on providing substantial written feedback on all submitted assignments.

Students had to exhibit an application of feedback to subsequent assignments to receive a complete.

Although the courses were ungraded, the program requires letter grades to be submitted to the university. Course grades were determined by the completion of all required assignments with evidence of growth. Additionally, students were required to complete a self-evaluation (Appendix C) that asked them to assess their achievement of course objectives and assign themselves a grade that was used as their final grade. However, the syllabus did explain that the instructor could use their discretion if they did not agree with the student's evaluation. The instructor would meet with the students in this case before assigning a different grade, but there were no incidents of grade disagreement.

Sample and Data Collection

Undergraduate Courses

The undergraduate fundamentals and phlebotomy courses enrolled 18 and 16 students, respectively, in the Fall of 2022. Students were asked to complete an optional questionnaire about their experiences in the courses (Appendix D). This questionnaire was administered via Qualtrics after final grades were posted, and responses were anonymous. Thirteen responses were collected from the undergraduate students. Additionally, 12 students responded to an optional reflective question at the end

fundamentals course. These reflections were also included in this study.

Graduate Course

The graduate course enrolled 9 students in the Fall of 2022, each with varying educational and professional backgrounds. A supplemental questionnaire (Appendix E) was distributed to the 9 students from the 2022 class and completed by 6. Data for this study also included learning activities completed as part of the course. The 2022 cohort was required to complete a self-evaluation as part of the course, and therefore 9 self-evaluations were collected and subsequently analyzed. Module memos were also implemented in the 2022 course. The memos were optional, and a total of 17 memos were submitted. Memos were submitted by 7 of the 9 students, but only 5 submitted more than 1 memo. Memos and self-evaluations for the graduate students were included in this study because they often mentioned the grading practices of the course.

Data Analysis

The supplemental questionnaire had open- and closed-ended questions that were analyzed qualitatively and quantitatively, respectively. Likert-type scales were used to determine students' perspectives of the assessment practices and their progress and growth in the research course, resulting in a 5-point score for each question.

Self-evaluations and module memos from the graduate course were qualitatively analyzed. Self-evaluations and final reflections for the undergraduates were also qualitatively analyzed. These course assignments did not explicitly ask about grading practices, but many students commented on them in their responses. Notes were taken while reading the documents, and themes emerged.

RESULTS

The results of this study demonstrated favorable outcomes of alternative assessment in the courses. Although the sample size is too small to provide definitive conclusions, the responses to supplementary questionnaires provide insight into how ungrading impacted student learning.

Additionally, the open-ended items on the questionnaire and the course assignments demonstrate that students felt a great benefit from the alternative assessment approaches that were implemented in 2022.

Quantitative Results

Most students did not have previous experience with a course that was ungraded. Most of the students did not have previous experience with alternative grading or ungrading. However, the feedback about the assessment approaches used was primarily positive. All 6

graduate students reported that they either slightly or strongly agreed that ungrading was appropriate for the course and that it was fair. Furthermore, all graduate students reported that they slightly or strongly agreed that it contributed to their growth in the course, while all strongly agreed that they were able to focus on their learning. Similarly, all undergraduate respondents indicated that they somewhat or strongly agreed that the grading approach was appropriate for the course(s) and that they were able to focus on their learning and mastery of course material. One difference between undergraduate and graduate students is that the undergraduates did not agree as strongly that the grading approaches contributed to their learning. None of the students, regardless of education level, expressed that they would have liked more concrete or traditional grades. Frequencies for each questionnaire item are provided in Figures 1 and 2.

Qualitative Results

Although the closed-ended questionnaire items provide some insight into the impact of alternative assessment approaches, the qualitative information gained from student self-evaluations, memos, and reflections further supports the usefulness and positive impact of ungrading. Open-ended questionnaire items asked the students to provide feedback on the strengths and weaknesses of ungrading in the courses. A common theme emerged that students were more focused on their learning and what they were going to take away from the course than the grade they were going to receive. For instance, one graduate student reported that they were “able to focus more on understanding”; another reported that “feedback was much easier to process and focus on when there wasn’t a number or grade letter associated with it”; and another student suggested that the approach may have “been beneficial to some to be able to focus on learning” when

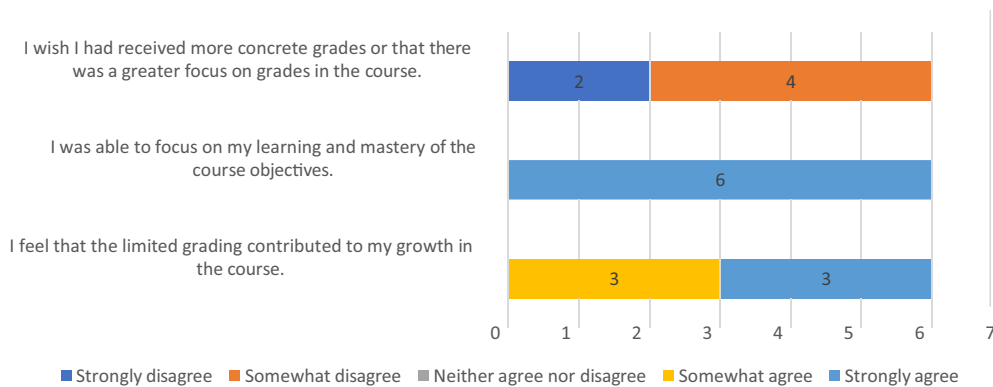


Figure 1. Graduate students’ perceptions of ungrading. Note: Graduate students were asked to rate how strongly they agree or disagree with the above statements; N = 6.

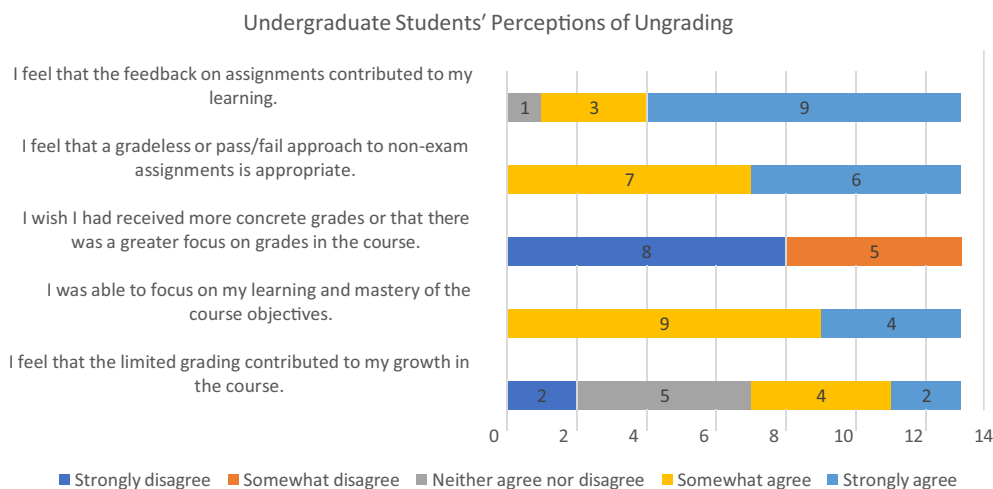


Figure 2. Undergraduate students’ perceptions of ungrading. Note: Undergraduate students were asked to rate how strongly they agree or disagree with the above statements; N = 13.

they came in with different levels of research experience. Students reported more strengths than weaknesses, but they did suggest that more concrete grades on larger assignments could provide a better understanding of how they were developing; but, they continued to say that “the score itself didn’t matter because the feedback that was given in the comments was enough for [them] to know what [they] did well and what [they] could focus on.”

Undergraduates reported similar feelings and experiences. One undergraduate said that alternative grading helped them learn because they were “less focused on stressing about the assignments and [were] able to focus on studying the overall concepts.” Feedback proved beneficial for many students in the undergraduate courses as they “spent time reading feedback and figured out what [they] missed.” Another undergraduate student reported that the alternative grading “lets the student move forward and keep studying stuff from before without it feeling like a useless effort.”

Course Performance

It is important to note that course grades were still assigned in the 3 courses. Although alternative grading was used in each of the courses, students had to exhibit an understanding of the course material and mastery of the skills performed in the student laboratory. The syllabus for the doctoral class explicitly outlined the criteria for exhibiting understanding and growth in the course. A lack of effort on assignments would lead to a nonpassing grade in the course, so students had to do more than just participate. The undergraduate courses were assessed similarly throughout the semester, but students still had to meet standards. This included meeting a 70% or higher on the final exam and sufficient performance on laboratory tasks. Again, students had to prove active engagement with the course material and could not receive complete marks on assignments without meeting standards. Students in all 3 courses were successful in completing the course material. Undergraduates, in particular, successfully passed their course exams and performed skills competently.

STRENGTHS AND LIMITATIONS

This study utilized courses that were already using alternative grading to assess its impact on student learning. The main limitation of the study is its sample size. CLS programs are often small, and the courses included in this study enrolled a range of 9–18 students. To effectively assess any association between alternative grading or

ungrading on CLS students’ learning, we would need a much larger sample size. Additionally, it would be beneficial to include CLS programs that have fully adopted alternative grading in all courses to truly evaluate the impact. To evaluate the impact of alternative grading on certifying examination scores, we would need to compare scores for students who attended traditionally graded programs to those who attended alternative graded programs. At this point, such a study is not feasible.

DISCUSSION AND IMPLICATIONS

Ungrading and alternative grading are not new concepts in higher education. Many elite medical schools use pass/fail assessments, but the literature on the practice in other health professions is lacking.³⁹ While there are limitations to this exploratory study, it provides an understanding of the students’ experiences with alternative grading and ungrading.

The students in these courses reported that they had positive experiences with alternative grading. Alternative grading allowed them to feel like they were learning more with less stress. Students felt less discouraged when faced with difficulties in coursework, which allowed them to focus on learning the course materials. This is particularly important in health professions education because learning in the classroom will translate to patient care.

As educators, we want our students to gain knowledge and competency in the field. However, traditional grading has placed unnecessary stress on students. This stress counteracts the teaching we do and can limit the learning accomplished in the classroom. Many students study to “pass the test,” and the pressure to make the grade may limit their ability to truly learn the material.

This is an important consideration for health professions educators because our students will eventually care for and treat patients. If students are not learning the material in the classroom, this could lead to deficiencies in their clinical competency. Ungrading or alternative grading may be valid approaches to increase learning and content mastery in laboratory professions. While we have yet to determine the impact of ungrading on Board of Certification scores or other competency measurements, the effect on meeting course objectives has shown to be positive. If alternative grading is appropriately executed, students should learn and master course content just as they would in traditionally graded courses. However, further research should be done to determine if there is a greater impact of ungrading on certification examinations and/or clinical competency for laboratory professionals.

APPENDIX A. PHLEBOTOMY CLINICAL EVALUATION

Thank you for training our phlebotomy learners!

Please take a moment to evaluate their professionalism and their phlebotomy skills by marking each section as “does not meet”, “needs improvement”, “meets”, “or “exceeds” expectations.

Keep in mind that this is their first time performing phlebotomy outside of the classroom. Provide any additional comments you feel are appropriate or necessary.

The learner was prepared for clinical. They arrived on time and ready to learn. They were wearing their scrubs and ID.

- Does not meet expectations
- Needs improvement
- Meets expectations
- Exceeds expectations

The learner met professional standards: They complied with institutional safety policies and procedures. They maintained confidentiality. They maintained a clean and orderly work area. They presented a professional appearance. They promoted a cordial work atmosphere and treated others with courtesy and respect. They demonstrated integrity.

- Does not meet expectations
- Needs improvement
- Meets expectations
- Exceeds expectations

The learner was adaptable: They accepted constructive criticism and modified behavior appropriately. They adjusted workflow when needed. They adapted site-specific protocols to generic tasks. They adjusted to unplanned changes in the schedule or assignment.

- Does not meet expectations
- Needs improvement
- Meets expectations
- Exceeds expectations

The learner was responsible: They complied with institutional policies and procedures. They were accountable for assigned work. They recognized limitations and sought help when needed.

- Does not meet expectations
- Needs improvement
- Meets expectations
- Exceeds expectations

The learner showed initiative and interest: They actively participated in performing assigned tasks. They followed instructions and asked appropriate questions. They were a self-starter in appropriate situations.

- Does not meet expectations
- Needs improvement
- Meets expectations
- Exceeds expectations

Please rate the learner’s professional performance overall.

- Does not meet expectations
- Needs improvement
- Meets expectations
- Exceed expectations

The learner performed pre-venipuncture tasks appropriately for their skill level. They examined the requisition and greeted the patient. They appropriately identified the patient. They performed proper hand hygiene and wore appropriate PPE. They applied the tourniquet appropriately. They identified appropriate veins and cleaned the site.

- Does not meet expectations
- Needs improvement
- Meets expectations
- Exceeds expectations

The learner performed the venipuncture appropriately for their skill level. They anchored the vein and smoothly performed the venipuncture. They did not move the needle when changing tubes. They collected tubes in the proper order. They mixed tubes appropriately. They removed the tourniquet before removing the needle.

- Does not meet expectations
- Needs improvement
- Meets expectations
- Exceeds expectations

The learner performed post-venipuncture tasks appropriately for their skill level. They activated the safety device immediately. They covered the site with gauze and applied pressure. They labeled tubes appropriately. They checked for bleeding and bandaged the patient. They disposed of supplies appropriately. They removed PPE and performed hand hygiene.

- Does not meet expectations
- Needs improvement
- Meets expectations
- Exceeds expectations

Please rate the learner's phlebotomy skill overall (keeping in mind this is their only experience outside the classroom).

- Does not meet expectations
- Needs improvement
- Meets expectations
- Exceed expectations

If there was an opening, would you hire this learner?

- No
- Maybe, with more training
- Yes

Please provide any comments you wish to share!

APPENDIX B. PHLEBOTOMY SELF-EVALUATION

After completing all other components of the course, please evaluate your performance. This should be a written evaluation, using proper formatting (12-point font, 1.5 spacing, full sentences, etc.). To assist you, there are some prompts, but they are not required for you to use. However, you must include what grade you feel you deserve and an explanation of why, and complete the objective table. The instructor may or may not assign this grade as your final course grade.

Objective	Rating		
	Proficient	Competent	Novice
Evaluate a test requisition for accuracy and completeness.			
Demonstrate a professional appearance and convey an attitude of confidence.			
Properly identify and communicate with patients in accordance with the guidelines provided.			
Demonstrate politeness and consideration in speech and manner.			
Conform to ethical, legal, and regulatory guidelines.			
Exhibit calmness and confidence in stressful situations.			
Follow the guidelines as provided in phlebotomy training materials.			
Respond appropriately to adverse events that may occur during or after phlebotomy.			
Perform venipuncture techniques appropriately.			
List sources of pre-analytical errors when performing phlebotomy procedures.			

How do you feel about your performance in this course? Address your performance in both the didactic and hands-on portions of the course.

What did you learn in this course?

What concept(s) do you think you need more time with?

Did you complete the learning activities and actively participate?

How confident do you feel about your phlebotomy knowledge and abilities after this course?

If you assigned yourself a grade for this course, what would it be? Why? What did you do well? What could you have done better?

APPENDIX C. RESEARCH METHODS SELF-EVALUATION

After completing all other components of the course, please evaluate your performance. This should be a written evaluation, using proper formatting (12-point font, 1.5 spacing, full sentences, etc.). To assist you, there are some prompts, but they are not required for you to use. However, you must include what grade you feel you deserve and an explanation of why, and complete the objective table. The instructor may or may not assign this grade as your final course grade.

Objective	Rating		
	Proficient	Competent	Novice
Develop a working knowledge of both qualitative and quantitative research paradigms, including research design, data collection and analysis, validity and reliability evaluation, etc.			
Create an informed basis to critically interpret, evaluate, and use published research studies in clinical laboratory science and related fields.			
Analyze and interpret results of scientific research in the field of clinical laboratory science.			
Integrate knowledge for the purpose of publication and dissemination of results to the scientific community and to the public.			

How do you feel about your performance in this course? What did you learn in this course?

What concept(s) do you think you need more time with?

Did you complete the learning activities and actively participate?

How confident do you feel about your research knowledge and abilities after this course?

If you assigned yourself a grade for this course, what would it be? Why? What did you do well? What could you have done better?

APPENDIX D. UNDERGRADUATE STUDENT UNGRADING SURVEY

I feel that the limited grading contributed to my growth in the course.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

I was able to focus on my learning and mastery of the course objectives.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

I wish I had received more concrete grades or that there was a greater focus on grades in the course.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

I had previous experience with other courses that were gradeless or pass/fail.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

I feel that a gradeless or pass/fail approach to non-exam assignments is appropriate.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

I feel that the feedback on assignments contributed to my learning.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Would any other kind of feedback have been helpful?

- No
- Yes

What kind of feedback do you feel would have been helpful?

I believe the grade I was assigned in the course was representative of my effort and performance in the course.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

If you feel that the grade you received was not representative of your effort or performance please explain:

I believe the grade I was assigned in the course was representative of my learning and knowledge of the course content.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

If you feel that the grade you received was not representative of your learning and knowledge of the course content please explain:

What do you think were the strengths of the grading approach in the course?

What do you think were the weaknesses of the grading approach in the course?

Please share any other thoughts/feelings about the grading approach in the course.

APPENDIX E. GRADUATE STUDENT UNGRADING SURVEY

I felt that the limited grading contributed to my growth in the course.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

I was able to focus on my learning and mastery of the course objectives.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

I wish I had received more concrete grades or that there was a greater focus on grades in the course.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

I had previous experience with other courses that were gradeless or pass/fail.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

I feel that a gradeless or pass/fail approach to doctoral classes is appropriate.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

I believe the grade I was assigned in the course was representative of my effort and performance in the course.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

If you feel that the grade you received was not representative of your effort or performance please explain:

What do you think were the strengths of the grading approach in the course?

What do you think were the weaknesses of the grading approach in the course?

Please share any other thoughts/feelings about the “gradeless” approach in the course.

I was comfortable with the idea of creating a research proposal before taking the class.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

I was comfortable with the idea of creating a research proposal after taking the class.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

I feel prepared to carry out research projects with limited guidance after taking the class.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

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