

COMMENTARY

Making the case for pass-fail grading in dental education

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The purpose of this paper is to explore the benefits of pass-fail grading as opposed to the more frequently used letter grade system in dental education. A pass-fail system can enhance student well-being, facilitate intrinsic motivation and promote competency-based education. Although this review is primarily based on literature from North America, this discussion is still relevant to European audiences because the issue of pass fail is an inherent grading issue in all types of education.

There are two kinds of grading schemes that fall on a continuum ranging from the use of only letter grades to being entirely pass-fail through the curriculum. In most US dental schools using a pass-fail curriculum, students are given a numerical score for written/clinical assignments, clinical assignments and other types of assessments. These numerical scores are converted into letter grades using pre-determined conversion criteria. A passing cut-off is then determined, and sometimes grades higher than this cut-off are given an honours designation.¹ Thus, formative grades may rely more on letter grades, and summative decisions of pass-fail are more tied to assessment of the student as competent/not competent with respect to certain criteria.

Currently, there are at least 8 dental schools using a pass-fail grading system in the United States. (<https://www.perio.org/sites/default/files/files/PDFs/Postdoc%20Education/ADEA%20Grading%20Resource%20Guide.pdf>). Most US dental schools still use the traditional letter grade system.² The use of letter grades can skew the assessment of competence in a number of ways. One, overall grade point average (GPA) may be more reflective of high credit courses even if some lower credit courses are more significant for dental education.³ Two, students may pressurise faculty to increase grades, causing grade inflation.⁴ Third, in a letter grade system, students may be promoted from year to year or even to graduate despite F grades in some areas. Fourth, grades can push students towards performance motivation as opposed to mastery motivation, negatively impacting a desire to learn for the sake of learning by

focusing too much on grades.⁵ Given that the letter grade system is problematic, the following paragraphs lay out the argument for adoption of a more pervasive pass-fail grading system.

1 | PASS-FAIL GRADING PROMOTES STUDENT WELL-BEING

An extensive body of research has found a high level of stress and burnout amongst dental students.⁶⁻¹⁰ One study reported that approximately half of dental students in Trinidad were in the clinical range for stress.¹⁰ Another study assessed perfectionism, psychological adjustment and the impostor phenomenon (a condition where high-achieving people constantly question their abilities and fear that their peers will discover that they are intellectual frauds) in health professions students (medical, dental, nursing and pharmacy). The results of this study showed that 30% of all health professions students were in the clinical range for the impostor phenomenon, 27.5% were in the clinical range for psychological distress and 21% of the sampled population had equal or greater stress than the typical undergraduate seeking mental health services at that particular university.¹¹

Grades have been identified as a cause of stress. Students in schools using grading scales with three or more categories had significantly higher levels of stress, emotional exhaustion, depersonalisation, and burnout, and to more seriously considered dropping out of school, compared with students in schools using pass-fail grading.¹² There is evidence from a dental school in Pakistan that moving away from the letter grade system leads to decreased stress and an increase in well-being. Students in a pass-fail assessment system had a significantly lower score on the Westside Test Anxiety Scale and the Perceived Stress Scale, indicating lower levels of test anxiety and overall stress than in students enrolled in the letter grade assessment system. The students in the pass-fail

system were also more satisfied with their performance.¹³ At the University of Virginia, the curriculum was changed to support a two-interval (pass-fail) system with cumulative honours rather than a five-interval (A, B, C, D and F) system.¹⁴ The result was significant increases in students' perceived well-being and personal life satisfaction for the first three semesters, as well as a significant increase in their satisfaction with their education. Similarly, student satisfaction with their learning curriculum increased, and average scores for courses remained above passing at the University of Michigan Medical School after they transitioned to a pass-fail grading system.¹⁵

The feeling of well-being is associated with multiple benefits. Studies note increased group cohesion and decreased competition whilst still performing well as a result of pass-fail curricula.¹⁶ Surveys administered to the pass-fail class showed students felt they had more time to explore additional academic interests and improve overall personal wellness.¹⁷ A pass-fail curriculum may also support student well-being by encouraging participation from students from different educational backgrounds,¹⁷ facilitating a more diverse learning environment.

2 | PASS-FAIL GRADING PROMOTES INTRINSIC MOTIVATION

A dental education workgroup identified a positive academic environment as one in which there is a focus on learning rather than performance, encouragement of collaborative learning and opportunities for continuous self-assessment.¹⁸ A curriculum that encourages a positive environment should push students to be motivated by learning itself (intrinsic motivation) rather than extrinsic factors.¹⁹ This kind of curriculum would discourage students from memorising "isolated facts" for a grade that has little bearing on career performance. Dental students traditionally are worried about their grades,⁵ and workload,²⁰ and fear failure,⁵ which favours conditions for promoting extrinsic motivation (getting a better grade) rather than intrinsic motivation (learning the information for learning's sake). A pass-fail system can create a supportive learning environment²¹ where students are focused on learning to think critically and evaluating evidence, which are the principal goals of dental education.²² In a series of three studies in samples of students enrolled in a psychology course,²³ findings indicated that a graded test induces performance-avoidance goals and cognitions related to self-esteem (ego involvement) as opposed to learning for mastery of the subject matter. Similarly, grades create a preference for the easiest task and diminish critical thinking and therefore may not be a good indicator of competence.²⁴ In contrast, a pass-fail grading system can have a positive impact on intrinsic motivation and professional identity, without impacting achievement.²⁵

Intrinsic motivation and autonomous self-regulation have a deep impact on student learning. A personalised and student-centred teaching style has the potential to improve student learning and

facilitate intrinsic motivation.²⁶ This style is manifested through timely and constructive feedback, team work and the presence of an autonomy supporting environment that allows students to value academic activities and not grades.²⁷ If a student is learning to learn (intrinsic motivation) and taking responsibility for their own learning, this will help to create healthcare providers capable of lifelong learning and evidence-based dental practice. Most importantly, all of these behaviours confirm the basic tenets of self-determination theory,¹⁹ which suggests that intrinsic motivation is tied to a growth mindset, deep learning, better performance and well-being and is achieved through satisfaction of the needs for autonomy, competence and relatedness, all of which contribute to a humanistic environment.^{19,28}

3 | PASS-FAIL GRADING PROMOTES COMPETENCY-BASED EDUCATION

In 1990, George Miller put forth a 4-layer pyramid for assessing clinical competence²⁹ (see Figure 1). An example of the type of assessment at each of these levels is as follows: Knows (written examinations); Knows How (clinical problem-solving exercises); Shows How (the OSCE) and Does (direct observation in clinical settings).³⁰ In order to assess at the "does" level, assessments have to be carried out in settings that mimic or are part of actual workplaces.³¹ Types of assessments at this level include mini-clinical evaluation exercises, mini professionalism evaluation exercises, direct observation and multi-source feedback.³¹ These together can potentially assess overall competency through documenting quantitative and qualitative longitudinal data in portfolios²⁸ and help evaluate "trustworthiness"³¹ of the student to perform clinical behaviours in actual clinical settings. For effective pass-fail grading to occur, it is important to have assessments at the levels of this pyramid that can document a student's progress and readiness for practice.

A second point to note is that having a good array of assessments to justify the use of pass-fail grading is not enough. Setting the appropriate passing score is very critical. There is no "gold standard" for setting the passing score(s). What the passing standards reflect must be clearly defined. A passing standard can be as high as needed depending on the purpose of the assessment and is not an absolute fixed point.²⁵ It is important to document all procedures used in setting the standard and also to ensure that it is defensible. Carefully designed rubrics are needed for grading, and ongoing evaluation of the grading process is needed to monitor the grading process.⁴ To enable that competency standards are interpreted judiciously, faculty must be trained and calibrated.³² A pass-fail grading system that is embedded in a mastery learning model, such as the Roseman School, is a good example of how the pedagogy and educational contexts need to be restructured to support the pass-fail grading concept at a structural level by supporting active and experiential learning (<https://www.roseman.edu/about-roseman-university/six-point-mastery-learning-model/>). Setting the passing standards can occur at many levels: within the course, as a summative course grade,

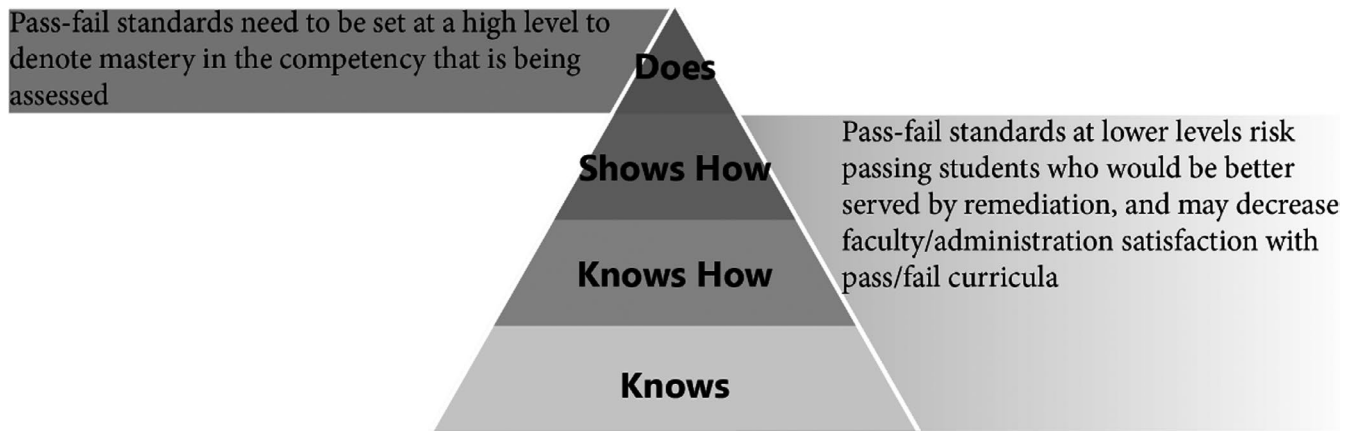


FIGURE 1 The Miller's Pyramid. Adapted from Miller GE. The assessment of clinical skills/competence/performance. *Acad Med* 1990; 65(9 Suppl):S63-7

at the end of various developmental stages such as D1, D2, D3, D4. Finally, dental educators must consider pass-fail standards with respect to the graduating students' preparedness for practice.³³

4 | CHALLENGES

Whilst the reported instances of pass-fail curricula in dental and medical education have shown to have beneficial effects on student well-being and the culture of learning, there are barriers in dental education. A pass-fail grading may be perceived as less rigorous because students do not receive an actual grade that allows for comparison with other students. One often-discussed challenge to adopting the pass-fail system is its effect on evaluating residency applicants.³⁴ 80% of dental residency programme directors have stated that they prefer a standardised, objective measure to differentiate applicants,³⁵ which may mean that graduates from pass-fail schools may be slightly disadvantaged if evaluated in this way for residency interviews. In a presentation at the American Dental Education Association's annual session, a group from the Harvard School of Dental Medicine presented survey findings from a nationwide survey of dental students, which found that 75% of students felt that a pass-fail curriculum would decrease their chances of matching into a specialty residency³⁶ even though no statistical difference between pass-fail curricula and graded curricula for residency placement and pass rate for board examinations have been found.¹⁴

The culture in dental institutions can also pose challenges. Evidence has shown that faculty prefer traditional grades,² and dental students fear failure. Fox puts forth a coherent argument that today's dental students belong to a safety conscious generation that struggles to be independent, fears failure, believes grades to be a final outcome and is reluctant to subsequent feedback.⁵ Thus, both faculty and students can display a fixed mindset²⁸ that may not be supportive of the execution of pass-fail grading. The culture at dental institutions needs to support a growth mindset that promotes lifelong learning and resilience in the face of failure by taking the focus away from grades. Strong faculty development programmes

that assist faculty in developing effective grading practices as well as support pedagogy and assessment practices that foster mastery learning in dental students will help address the challenges to the adoption of a pass-fail grading system.

5 | CONCLUSION

A pass-fail grading system has the potential to encourage intrinsic motivation and foster mastery oriented learners. Pass-fail curricula may help dental educators more effectively realise their primary goal—to create healthcare professionals who are lifelong learners. However, there are challenges mainly from the lack of clarity in setting pass-fail standards and the lack of conditions to foster growth mindset in students as well as faculty within the dental educational contexts. Both these challenges need to be addressed if pass-fail standards are to be effective in promoting deeper learning.

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