

Objective

To review the literature on traditional and alternative grading models used in healthcare professions' education and discuss the advantages and disadvantages of each.

Background

In 1785, Yale University adopted the first version of the traditional grading model, which evolved into the now traditional ABCDF letter grade model.¹ This grading model allows easier final grade calculations, a clear delineation of passing versus failing, and determination of students' class rank, but may not accurately measure students' competency as the profession evolves into more person-centered care. Further, there is inconsistency in higher education on what activities and/or exams make up a students' final grade in this model. Due to these issues and more, there has been questioning in higher education if an alternative grading model is needed to better assess student competency and achievement of educational outcomes.²

Methods

The Aspiring Academics program contributes to the development of future faculty members in the academy as a program for students to learn about academic pharmacy. The selected students are assigned a current topic relevant to pharmacy education to research during the year. A literature review was conducted using PubMed independently using the following search terms, "competency based education", "competency-based education", "mastery learning", "traditional grading", and "pass-fail" in any healthcare professions' training, excluding models used exclusively in experiential education, one classroom setting or course, or outside of the US. Literature was shared in a Google Drive and summarized at monthly meetings for consensus on inclusion. Four common grading models were agreed upon and their description, advantages, and disadvantages were summarized independently by an Aspiring Academics student.

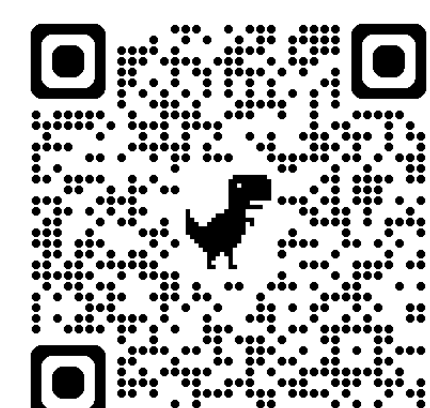
Mastery Learning

The philosophy explains that, when given a sufficient amount of time and resources, any student can achieve mastery of a taught subject.³ The overview of a mastery learning based approach uses the self-determination theory of motivation and its three aspects of autonomy, competence and relatedness to foster an environment that supports student motivation.⁴

The general overview of the mastery learning model starts with defining a block of time in which a subject will be taught, and creating specific goals for students to demonstrate mastery of the subject. Next, a specific period of time for instruction should be allotted, and after instruction is completed students are given a formal assessment. The minimum threshold for "mastery" is generally accepted to be no less than 80%, but more often is set at 90% when compared to its standard grading scheme equivalent. Students demonstrating achievement of mastery can be given supplemental enrichment activities, while those who did not achieve mastery should be retaught and reeducated with an individualized approach. After a period of time for reteaching and reeducation, students will be given another formal assessment, similar to the first assessment but with questions differing in structure or format.^{3,5}

Advantages: The mastery learning educational model has notable benefits for students and teachers, contributing to better educational outcomes, and overall mental well-being for students. Notable concepts that mastery learning addresses are that; students will be graded on their individual performance of predetermined standards and not relative to their peers, and throughout learning students will be given non-graded, diagnostic assessments to promote and pace learning, students achieving mastery will be given the appropriate grade reward and students will be given individualized support depending on their specific deficiencies highlighted in their diagnostic assessments.⁵ Another highlighted strength of this model is its alignment with the Universal Design for Learning (UDL) framework, which shows benefit across students with disability, diversity, equity and inclusion. This supports the idea that students should be able to learn regardless of their ability or identities.⁴

Disadvantages: Since many schools continue to use the traditional grading system, there is a barrier to implementation of the mastery learning system, as it will increase faculty workload. This is because in the mastery learning model, multiple versions of assessments are needed, and feedback needs to be given after every assessment, which poses a potential problem for faculty. On the other hand, classes designed with the mastery learning framework that are overlapping may pose a problem for students and lead to student work overload and failure to appropriately manage time.⁴



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Traditional

Traditional grading is the conventional approach to evaluating students' academic performance through the assignment of letter grades or numerical values, aiming to reflect their competence.



Pass/Fail

Students are designated either with a (P) for passing or an (F) for failing, eliminating the need for a detailed breakdown of their performance.



Competency

Competency-based education tailors curriculum to evolving health system demands, emphasizing technical skills, attitudes, and behaviors, to prepare professionals for modern patient- and population-centered healthcare.



Mastery

Mastery learning entails group-based, teacher-paced instruction, allowing students ample time and resources to achieve subject mastery, followed by personalized enrichment or remediation based on assessment outcomes.

Traditional

Educators have critiqued this method and highlighted its shortcomings. However, it is important to understand the both the benefits and drawbacks in order to accurately assess the effectiveness of traditional grading. This is also important to know as future directions of research investigate alternative approaches that may assess learning outcomes and proficiency more accurately.

Advantages: The traditional grading system offers several benefits to students, faculty, and the pharmacy program. A 2018 study showed that students from 4-year programs attending a public institution using a grade point average had greater odds of matching into residency programs.⁶ This method is convenient to faculty as it provides a standardized method for comparing students and evaluating performance. Colleges of pharmacy and residency programs often use grade point averages as a metric to evaluate potential candidates. Although this only one part of the holistic approach, it is an important one as it is well established and would be cumbersome to revise.

Disadvantages: While no method of assessment is deemed perfect, the traditional method of grading has received the majority of the critique. A 2022 review identified several key disadvantages associated with the traditional grading method.² It is emphasized that grades are often composed of information other than achievement (eg, attendance). This raises questions about the validity and reliability of traditional grading systems in accurately measuring learning outcomes. Students may also be negatively impacted when being evaluated by residency programs. Another key point made is that traditional grading may not accurately predict clinical performance. This highlights the disconnect between the conventional grading system and real-world competency and the potential need for better alignment between academic assessment and real-world skills.

Pass/Fail

Pass/Fail alleviates the burden of maintaining a high GPA but also diminishes the competitive atmosphere among students, allowing them to redirect their focus towards the essential aspects of the learning process.⁷ As of 2022, ten pharmacy schools utilize pass-fail grading systems, exhibiting variations in grade designations such as honors, pass-fail, high pass, and low pass.⁸ These schools also differ in the minimum passing grade requirement, ranging from 70% to 90%.

Advantages: The pass-fail grading system offers notable benefits, contributing to improved wellness and decreased stress levels among students. A study investigating strategies to improve overall well-being and alleviate stress in medical students found a correlation between implementing pass-fail grading and an improvement in their overall mental health.⁹ The study suggests that incorporating pass-fail grading into curricular reforms aimed at promoting student well-being can be effective. Furthermore, this grading system may motivate students to pursue higher levels of knowledge and tackle more complex subjects, as the assurance that their GPA won't be adversely affected creates a positive learning environment. Implementing the pass-fail grading system can also mitigate the competitive atmosphere among students, fostering a class environment that prioritizes collaboration and mutual support.¹⁰ This shift away from individual competition towards collective cooperation can promote a sense of teamwork between students with shared academic goals.

Disadvantages: Although there are many benefits to the pass-fail system, it does not come without its own challenges. In some cases, the pass-fail designation might not show enough information on a student's capabilities to potential employers or residency programs.¹⁰ This could potentially put students at a disadvantage when their transcripts are being evaluated. It also may be harder for students to assess their own strengths and weaknesses in different areas of learning. Additionally, there is a notable lack of uniformity in how pass-fail systems are implemented across different pharmacy schools, which could cause inconsistencies in academic evaluations.⁸

Competency-Based Education

Addresses health system and population needs including epidemiological shifts, aging populations, conflicts, and pandemics.¹¹

Advantages: CBE ensures that pharmacy students are proficient in performing tasks and skills that are critical in their role as future pharmacists and the evolving field. Not only this, but it allows students to progress that their own pace and focus on areas that may need improvement. Because of this, CBE allows for individualized learning and tailor the needs of the curriculum to support each student. Faculty are also able to better simulate "real world" scenarios so that pharmacy students are better prepared to address challenges that they may encounter once they enter the career field.¹²

Disadvantages: CBE requires significant resources, manpower, administrative support, and technological infrastructure, which may pose a challenge for institutions with limited resources and funds. Because of this, schools may find the complexity and time requirement to shift from traditional models to a more complex evaluation strategy, such as CBE, too costly and time-consuming. This resistance to change may also be enhanced by faculty and students who are more comfortable with evidence-based traditional models. Standardization of CBE also poses a threat, as states and institutions may develop different competency standards that students must meet. Lastly, CBE education focuses on creating outcomes that match real-life situations. This may potentially overlook the development and fostering of critical thinking skills and need for deeper understanding in student to become competent healthcare providers.^{11,12}

Conclusions

In conclusion, alternative grading models have been described in the literature and may serve an advantage over traditional grading. Alternative grading models each have unique principles and practices; however, they include having student-centered, mastery-oriented approaches. While there are many advantages to alternative grading models, implementing such models remains a challenge due to limited literature on student outcomes, faculty, and pharmacy education. Additionally, the lack of clear definitions of each model and implementation standards serves as another barrier. Translating non-graded models, especially in the sense of post-graduate education, could pose challenges leading to uncertainty regarding student progress and performance.

The insights gained from this literature review unveil exciting possibilities for future research aimed at identifying resources required to implement change as well as assessing student readiness for rotations and practice and faculty readiness for change. Further exploration of individual institutional models and comparing it to student outcomes would also provide more clarity on the effectiveness of alternative grading systems. Finally, investigating whether these alternative grading models support diversity, equity, and inclusion is very important for ensuring educational practices are accessible and equitable for all students.