Controlling the Assessment Paradigm:
Promoting a Growth Mindset Across the Medical Education Continuum

Aditi Puri, MD, a Milad Memari, MD, b Elisa M. Sottile, MD, c Laura K. Snydman, MD, d Wei Wei Lee, MD, MPH, e Rachel A. Bonnema, MD, f Danielle Jones, MD, g D. Rani Nandiwada, MD h

aDepartment of Internal Medicine, MacNeal Hospital, Loyola University Health System, North Riverside, Ill; bDivision of General Internal Medicine University of Pittsburgh Medical Center, Pa; cDivision of General Internal Medicine, University of Florida College of Medicine — Jacksonville; dDivision of General Internal Medicine, Tufts Medical Center, Boston, Mass; eSection of General Internal Medicine, University of Chicago Pritzker School of Medicine, Ill; fDivision of General Internal Medicine, University of Texas Southwestern School of Medicine, Dallas; gDivision of General Internal Medicine, Emory University of Medicine, Atlanta, Ga; hDivision of General Internal Medicine, University of Pennsylvania Perelman School of Medicine, Philadelphia, Pa.

INTRODUCTION

Competency-based medical education (CBME) forms the basis of assessment in health professions education and aims to develop competent health professionals by utilizing direct observations and formative assessments to inform summative decisions on the progress of learners. Learners performing at a certain standard are deemed competent to progress to the next stage.1-3 However, the current evaluation system of emphasizing top summative grades creates a dissonance for learners with aspects of CBME and leads to a fixed mindset that prioritizes evaluation over growth.4,5 Given that medical learners train in a culture focused on perfectionism, medical educators should be aware of a hidden curriculum that teaches that vulnerability and imperfection are equal to failure. This hidden curriculum likely undermines valid assessment by encouraging learners to hide their areas for growth, which can ultimately lead to poorer patient outcomes.

One way to resolve the dissonance is by embracing a culture of growth mindset in CBME. Mindset theory suggests that implicit assumptions about the origin of our abilities, intelligence, and talent have a profound impact on how we view our mistakes or failures.6 A fixed mindset assumes that intelligence and ability are static, and success is the affirmation of inherent intelligence. In contrast, a growth mindset approach to learning suggests that ability is acquired through effort, with failure as an opportunity for improvement.6 Utilizing a growth mindset, educators can help learners achieve superior outcomes after they have worked through areas of weakness, thereby increasing the validity of assessments. Ultimately, a growth mindset culture can redirect a learning trajectory toward increasingly complex tasks and help a learner gain skills to pursue lifelong learning.

Funding: The authors report none.

Conflicts of Interest: The authors have no financial conflict of interest to report.

Authorship: All authors had access to patient data and played a role in writing the manuscript.

Requests for reprints should be addressed to Aditi Puri, MD, Department of Internal Medicine, Loyola University Health System, 3722 S Harlem Ave LL34, North Riverside, IL 60546.

E-mail address: aditipuri123@yahoo.com

0002-9343/$ -see front matter © 2022 Elsevier Inc. All rights reserved.
https://doi.org/10.1016/j.amjmed.2022.10.004
In this perspective, the authors examine the relationship between the current assessment system and fixed mindset throughout medical training and propose reasons why the incorporation of growth mindset could be beneficial for medical training. The perspective highlights tangible and innovative strategies to incorporate growth mindset into the current assessment system, ultimately providing a pathway to train future competent physicians and master adaptive learners ready to tackle the challenges of health care in the future.

RELATIONSHIP BETWEEN ASSESSMENT AND FIXED MINDSET IN MEDICAL TRAINING

The current assessment system fosters a culture of fixed mindset across the medical training continuum. In undergraduate medical education (UME), assessments often focus on examination scores and clinical grades. In a recent survey of 84 US and Canadian medical school respondents, 81% reported pass–fail grading in preclinical years, while only 10% reported pass–fail grading during clerkship years. The clerkship evaluation system motivates students to focus on getting the highest grade possible and performance rather than focusing on learning and improving. The dissonance between growth and assessment has been further exacerbated by the increasingly high-stakes nature of clerkship grades, as residency programs rely heavily on them for recruitment. Clerks in grades also have the potential to become increasingly important with the change to pass–fail grading for Step 1. Despite the emphasis on grades, it is notable that Step scores and medicine clerkship grades are not associated with intern year milestone performance. Ultimately, the current assessment system implicitly reinforces the culture of a fixed mindset early during medical training.

In graduate medical education (GME), assessment strategy has shifted to milestones that highlight the importance of growth by creating levels for each competency rather than a summative grading system. Adoption of the milestones should theoretically decrease the tension between evaluation and learning. However, the assessment of whether a learner has achieved competency with an individual milestone still relies on discrete time-specific performances. As a result, there is a gap that exists between the intent of promoting a growth mindset and the learner experience in the practical clinical environment. Residents report that feedback continues to be vague and feels punitive during residency. Huffman et al examined the tension between feedback and assessment in GME and noted that residents felt that they had to put on a staged performance of competence. Residents with a fixed mindset were more likely to hide their weaknesses and less likely to ask questions when they were uncertain. Residents were more likely to adopt a fixed mindset when they felt that the assessment had a high impact on their future careers. Thus, despite the intent of growth in the milestone system, a fixed mindset continues to be propagated during GME training. Furthermore, because a fixed mindset prevents learners from openly showing their weaknesses, supervising faculty may face challenges when helping them reach their maximum potential.

WHY IS THERE A NEED FOR CULTURAL SHIFT TOWARD GROWTH MINDSET?

The self-perpetuating cycle of a fixed mindset in medical training becomes a barrier that impedes learners in their educational trajectory. The reporter-manager-interpreter-educator framework has been well-established in UME and charts learner progress, but further steps could be taken to emphasize growth mindset. The ability to work together to identify new goals, strategize to improve weaknesses, and normalize continuous feedback or coaching would create a valid assessment of competence and promote excellence rather than a façade of unattainable perfection without hard work.

One important advantage of a cultural shift toward a growth mindset is that it can help create self-directed master adaptive learners able to tackle the expected and unexpected challenges during their career trajectory. Cutrer et al describe a model of the master adaptive learner with 4 phases (planning, learning, assessing, and adjusting phases) and argue that these skills are necessary for learners in the rapidly changing world of health care. The model is based on the concept of adaptive expertise, which uses reflection and critical thinking to balance routine expertise with effortful learning. Encouraging a growth mindset in learners helps them develop skills for reflection and self-
assessment because vulnerabilities are more likely to be viewed as opportunities for improvement. Ultimately, reflection and self-assessment practices can help form our learners into master adaptive learners who are better equipped not only to learn, but to react to changing environments and tackle the challenges of health care in the future.

Additionally, the association between a fixed mindset and the tendency to hide weaknesses should raise a concern about the accuracy of current assessment tools. Supervising faculty are likely unable to assess where a learner needs help because of the culture of a “perfect” staged performance, and the accuracy of such assessments is particularly important during training transitions. For example, it becomes difficult for GME program directors to assess the significance of an honors grade with grade inflation noted in the literature.14 Similarly, in GME, assessments and letters of recommendation often focus on a learner’s strengths during application for fellowship or faculty practice. A discussion of growth trajectory or hard work is often stigmatized in our experience. Ultimately, this environment creates difficulty in identifying areas in need of development at the next career stage. Adoption of a growth mindset can help normalize a discussion of areas of growth in assessments and evaluations for better communication between programs during transitions in medical training. Importantly, a cultural shift toward a growth mindset can increase the ability of supervising faculty to ensure that learners reach their maximum potential beyond competency, strengthening our current assessment system.

In conclusion, a shift toward a growth mindset in medical training will likely help develop master adaptive learners, help support faculty to develop our trainees beyond competency, and increase the accuracy of assessment tools as learners share their weaknesses. Changing to a growth mindset culture aligns with the goal of CBME of creating competent physicians using observation, feedback, and deliberate practice.1-3 We believe the incorporation of a growth mindset will strengthen CBME, increase trust that learners are prepared for the transition from UME to GME, and ultimately create more trust that learners are truly competent as they enter practice.

**INNOVATIVE STRATEGIES TO CREATE A CULTURAL GROWTH MINDSET SHIFT THROUGH ASSESSMENT**

**Train Faculty and Learners**

The first step in the cultural change would be to simultaneously train faculty and learners on the principles of a growth mindset. Little is known about how familiar faculty are with the concepts of growth mindset and how they incorporate these concepts into their teaching interactions or assessment strategies. Faculty need instruction in understanding and implementing the principles of the growth mindset.15 For many learners, a cultural shift toward a growth mindset will be a significant change due to the prevalence of a fixed mindset. Learner and faculty interactions should include appropriate messaging by faculty where the intention of growth is the clear goal in assessment. Such training will be the first step in, hopefully, normalizing a discussion of identifiable areas of growth in formative and summative assessments, thereby increasing the reliability of the assessments.

**Develop New Standards Emphasizing Growth Mindset Throughout Medical Training**

In addition to normalizing a discussion of areas of growth in current assessments, the creation of new assessments that specifically track a learner’s growth mindset would further foster a break from the self-perpetuating cycle of fixed mindset.

In UME, we propose that an important step toward highlighting the value of growth for students may be taken by creating a new Entrustable Professional Activity (EPA): **Recognizes that assessment of performance leads to growth.** The authors propose an example of such an EPA in Figure 1. Such an EPA would encompass personal and professional development and practice-based learning improvement competencies. Adoption of an EPA highlighting growth will require expert consensus and validation through pilot testing. However, these steps will likely help the Liaison Committee on Medical Education (LCME) create a standard across institutions and signal a cultural shift toward a growth mindset. Ultimately, such steps are important to set the foundation for assessment frameworks that can eventually help clarify these learner attributes for GME programs during recruitment. Employing such strategies will also emphasize a growth mindset from the onset of medical training, mitigate the self-perpetuating cycle of a fixed mindset that currently exists, and allow accrediting bodies to create change for which they can hold institutions accountable.

In GME, one potential way to help decrease the gap between the intent of growth and the practical clinical environment is to create validated tools that assess learner aptitude for reflection, professionalism, and systems understanding to build upon the growth mindset highlighted in CBME.1,3 In GME assessment, the authors propose the creation of a new growth mindset or master adaptive learner competency as a first step toward driving culture changes (Figure 2). This umbrella competency would allow programs to monitor a learner’s progress in the development of a growth mindset. GME programs could also highlight this progress when the residents transition to the next phase of
training or to become faculty. Ultimately, the new growth competency will create a programmatic cultural change and further build on the momentum started with the incorporation of a growth mindset standard in UME.

**Standardize Assessment During the Transition from UME to GME**

As UME and GME individually start to use strategies to promote a growth mindset in their training programs, it will also be important that such a mindset be promoted during the transition. Creating a growth milestone EPA could allow for more differentiation among applicants for residency and allow GME programs to personalize growth strategies for each learner sooner. Additionally, under the guidance of both LCME and the Accreditation Council for Graduate Medical Education (ACGME), national standardization for Medical Student Performance Evaluation letters and letters of recommendation could include a required discussion about the progress of a student. Such a standardization could further strengthen the cultural shift to a growth mindset and likely increase the reliability of information during the UME to GME transition. Inclusion of progress statements in evaluations would encourage the learner to set goals and self-reflect rather than rely on peer comparisons. Additionally, LCME and ACGME could provide guidance on reflection and behavioral interview questions as part of
recruitment. Some of these steps are outlined in the recent Coalition for Physician Accountability recommendations and can be used as a guide to foster a growth mindset. These tangible steps at a national level would change the conversation from a merit-based system relying on peer comparisons to one that encourages learners to reflect on their performance and focus on continuous learning and improvement.

Incorporate Learner-Centric Coaching to Create Master Adaptive Learners

Learner-centric coaching is a model of direct observation and individualized feedback designed to help the learner reach maximum potential. Literature identifies 3 core elements that promote a successful coaching relationship: mutual engagement with the shared goal of growth and development, ongoing reflection, and an acceptance of failure as a stimulus for learning.

Safe, collaborative relationships are critical to the success of any program directed at developing a growth mindset. These relationships are valued by learners and increase acceptance of feedback. In one study, students identified the existence of a coaching relationship that involved regular interactions and direct observations without summative evaluations as essential to their ability to develop a feedback mindset. Residents similarly report that having longitudinal relationships with faculty increases their acceptance of and the perceived credibility of feedback, thereby helping them develop a growth mindset. Incorporating longitudinal coaching relationships into the current medical education system for all learners at all training levels is vital to establishing a culture of growth mindset.

The authors believe one way to create a cultural shift toward coaching is to create robust faculty development such that coaching occurs in daily interactions with learners. Faculty should learn how to make meaningful observations on hospital rounds or during clinics, then debrief with learners. Furthermore, faculty should become familiar with frameworks published in the literature that engage the learner. This includes models such as the “Prepare to ADAPT [Ask Discuss Ask Plan Together]” framework and the Build Relationship, Explore Reaction, Explore Content, and Coach for Performance [R2C2] framework. Adoption of such frameworks could increase the accuracy of assessment and encourage reflection by the learners to help develop self-directed learning skills.

CONCLUSION

The current assessment system creates systematic adoption of a fixed mindset throughout medical training; a shift in the paradigm of assessment during medical training is a critical component in incorporating a growth mindset across the medical training continuum. Such a cultural shift can help create a training model focused on self-reflection, personal growth, and self-directed learning. The authors acknowledge that such a culture change will come with challenges, including the need for faculty development and engagement of national experts. However, this investment will be worthwhile to help the next generation of physicians develop skills beyond competence and ultimately improve patient care through adaptive learning strategies. When a critical mass of physicians and learners embrace the growth mindset, this approach to lifelong learning can spread exponentially.

References

16. Coalition for Physician Accountability. Initial summary report and preliminary recommendations of the undergraduate medical education to graduate medical education review committee.


