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Disruption and Dissonance: Exploring Constructive Tensions Within Research in Medical Education

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Abstract

The academic medicine community has experienced an unprecedented level of disruption in recent years. In this context, the authors consider how the disruptions have impacted the state of research in medical education (RIME). The articles in this year's RIME supplement reflect several constructive tensions that provide insight on future for the field. In this commentary, the authors discuss themes and propose a framework for the future. Recommendations include: normalizing help seeking during times of disruption and uncertainty, contextualizing the application of complex approaches to assessment, advancing and problematizing innovation, and recognizing the deeply embedded and systemic nature of inequities.

The past year has been characterized by an unprecedented level of disruption for research in medical education (RIME). The confluence of several events including the COVID-19 pandemic, global awakening to racism and police brutality, and polarizing sociopolitical climate have catalyzed personal and professional reflection for many in the RIME community. In this context, we consider the ways in which RIME may have shifted during the events of 2020 and 2021. At this moment in history, our generation of medical education researchers have been tasked with advancing our field. The story of the future is still being written. What will be the narrative that future generations of medical education researchers remember about us? This year's RIME supplement provides some guidance in the always dangerous game of predicting the future.

As we reviewed the accepted articles for this year's supplement, we were struck by how all of them identified and built on specific constructive tensions related to our field of research. While all research seeks to fill gaps or clarify understanding, the work in this RIME supplement identifies productive areas of uncertainty, disagreement, or debate to propose new perspectives, solutions, and questions. We inductively identified 4 areas in which these important constructive tensions exist throughout the papers in this issue. We suspect that addressing these tensions will be significant for future research in the field of medical education. We begin by describing how interruptions related to the past year led researchers to explore the tension between navigating uncertainty while reconciling emergent demands. Second, we describe tensions between assessment in theory and assessment in practice. Third, we explore tensions related to understanding innovation in medical education, and last, we describe tensions related to advancing justice. Taken together these tensions addressed by the papers point to productive and exciting future for medical education.

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Navigating Uncertainty While Reconciling Demands in Practice

Disruptions posed by the pandemic forced us to challenge many of the assumptions about our educational practices in the medical education community. Compulsory interruptions to our clinical practices prompted us to question whether gaps in clinical practice would have a devastating effect on trainee's performance. RIME articles directly addressed this tension and revealed unanticipated findings. For example, Scott and colleagues found that although gaps in practice from the operating room negatively affected residents' short-term performance, their maximum performance was positively and strongly correlated with the number of times a trainee took time away from surgical training.[1] Though surprising, this finding does align with the implications from spaced or distributed practice.

These disruptions also underscored the role of uncertainty experienced throughout physicians' professional identity formation. Though clinical uncertainty has been well studied, professional uncertainty, on the other hand, has only recently become a focus of inquiry. RIME papers explored various facets of uncertainty ranging from Forsey and colleagues' review of communication skills to Ilgen and team's exploration of how resident trainees dealt with professional uncertainty as they attempted to balance between meeting their own learning needs and ensuring patient safety.[2,3] Ilgen and team found that a trusting relationship between a trainee and their supervisor must be established for trainees to feel safe about asking for support that is appropriate for their level of training.[3] Brondfield and colleagues echoed similar claims around normalizing stress and providing level appropriate assistance to reduce fellows' cognitive load during inpatient consults.[4] Knowing that professional uncertainty is a given and may be more prominent during transitions between phases of development, Russel and team postulated that intentionally exposing medical students to the discomfort of uncertainty through the residency application process is one way to help them develop skills necessary to handle uncertainty in the future.[5] All 3 articles highlight the importance of normalizing the discomfort experienced during uncertainty and cognitive overload

and a nonpunitive structure to provide guidance and support throughout stages of professional development.

Professional uncertainty was also accompanied by emotional uncertainty during the past year. A potential effect of maladaptive emotional responses to uncertainty is the phenomenon of "shame reaction" toward real or perceived incompetence throughout expertise development. Medical students, at the lowest level of expertise development, are most at risk of experiencing shame and developing maladjustment as they struggle through the process. Bynum and colleagues sought to understand medical student's experiences with shame as they interact with their environment.[6] At the core of such inquiry is its profound and long-lasting impact on medical student's professional formation. One way to normalize help seeking behavior is designing an assessment system that is both "for" learning and "of" learning. Lipman and colleagues developed an educational handover letter template for those applying to surgery residencies that highlighted essential components deemed useful to program directors as they onboard new residents.[7] Of the 22 elements, discernment (knowing when to ask for help) and demonstrating growth-oriented behavior were among the most important. Such insights help us align education with the nature of practice: ubiquitous and constant uncertainty. Developing curricula to help learners address uncertainty will endure as a theme for future medical education research.

Assessments as Tools, as Systems, and Social Technologies

Determining the readiness of trainees for progression to the next stage or professional practice is one of the most significant institutional responsibilities of medical education. The pandemic created disruptions in how our field was able to use assessment to meet this vital responsibility. The creative responses to assessment challenges in the pandemic must still grapple with the ongoing tensions in assessment research. The role of assessment tools in comparison with the systems, cultures, and contexts in which they are deployed continues to be scrutinized in our field for both gaps and opportunities.[8,9] The papers in this special issue continue the important traditions of assessment RIME by considering issues of validity, feasibility, and alignment with the experience of individuals that ultimately enact assessment.

Validity issues remain paramount in deciding on the utility and relevance of assessment tools. Bajwa and colleagues use the lens of validity to address challenges in one of the most difficult competencies to assess: professionalism.[10,11] Medical education has had a sea-change in recent years in understanding validity as a construct and the appropriate methods for generating and collating validity evidence.[12,13] Bajwa and colleagues' application of a validity framework to professionalism assessment may create new opportunities to reconsider the challenges and limitations of our approach to assessing professionalism.[10]

While validity is a well-known theme in assessment work, consideration of systems of assessment and the dynamic role of assessors as co-creators of that system are relatively new threads in our discourses on assessment. Anderson et al's scoping review on the implementation of workplace-based assessments (WBAs) highlights the need to take a broader view of our assessment initiatives beyond the level of just the tool.[14] Considering one's local context, the theoretical rationale for implementation, and addressing the barriers are just as significant for the success of assessment programs as the accompanying validity evidence. Anderson's review also shows the limits of the current approaches to studying assessment tools at single institutions or context which limits both practical and theoretical generalizabilities as we seek to develop a strong empirical basis for WBA programs.

As illustrated by the pandemic year, a central challenge in applying assessment research into practice is our nascent understanding of the human element. Forte and colleagues delved into this complexity through their work on a rater cognition perspective on the use of entrustment scales.[15] Their results highlight the inherent difficulties of implementing generalizable WBA when raters in a single institution have unique frames of reference and rely heavily on context to make decisions. As noted by the authors, assessments are co-constructed by the experiences and cognitive frames of assessors as well as the processes, systems, and tools used to generate the assessment. Taken together, the papers in this issue highlight the areas in which our traditional considerations around assessment are still needed—and where they may need to be complemented with new perspectives and theories.

Innovation as a Solution … and a Problem

The RIME special issue also profiles the engagement of medical education with the most innovative changes in other domains of academia, science, and technology. Without a doubt, the most pressing innovation in medicine and medical education is the rise of artificial intelligence (AI) and big data. The 2 papers on AI demonstrate how AI can improve existing processes and also how these innovations need to be accompanied by changes in education to better prepare trainees for an AI future.[16,17] Burk-Rafel and colleagues used an AI algorithm to address the wicked problem domain of residency selection.[16] While their machine learning algorithm demonstrated improvement on existing practices, the authors also took the vital step of outlining how these technologies can serve to support mandates of expanding admissions, diminishing biases, and addressing equity issues. As AI becomes increasingly prominent in medical education, these considerations will also have to be part of the teaching of AI as a technological innovation. Lee and colleagues assist in this endeavor with their scoping review of the existing literature on AI in undergraduate education.[17] And clearly, there is much work to be done given the paucity of empirical literature on curricula, instructional tools, and demonstration of efficacious training. Some papers highlight that innovation are not simply about the incorporation of new technologies. As Ridinger and colleagues demonstrated, we have much to learn on how to teach and prepare trainees for long-valued but seldom well-taught foundational disciplines like health systems science.[18] Their realist-inspired study of faculty members' experiences in training residents in health systems sciences provides a conceptual road map for the design of future curricula in health systems science.

Such grounded understandings necessarily reflect not just the technologies but also the social and personal context of how innovations come to be enacted effectively.[19] In this vein, Colbert-Getz highlight the diversity of features in the published "innovation" literature.[20] Their work challenges our long-established notions of the criteria by which innovations—at least in their published forms—are understood and appraised. Moreover, their work highlights the conceptual blurring between research articles and innovation articles. This suggests that there is much work still to be done in maturing the genre of innovation articles while maintaining flexibility and openness to novel forms of disseminating innovation. Perhaps a necessary lens is applying a theoretical understanding of innovation practices as Hamza and Regehr have done in describing the longevity of innovations in education contexts.[21] Using theories from implementation science, their critical narrative review proposes the concept of eco-normalization: a dynamic interaction and relationship between people, systems, and context. By providing a more comprehensive and socially embedded framing, eco-normalization can help us understand the sustainability and viability of new innovations. Or put more simply, innovations like AI can have unintended consequences—unless we are able to understand the social and contextual dimensions of how they become enacted. Reconciling the tension between the promise and perils of innovations will remain important work for future research.

Advancing Justice While Recognizing Complex Identities

Many of the papers in this special issue also underscore a reckoning with issues related to racism that are endemic within the medical education system. Through research, authors remind us that academic medicine cannot look away from the inequities that plague us and the human cost of our inaction is too great. Various articles highlight there is a central tension to some of this important work. There is often a tendency to oversimplify the problem, as well as potential solutions. We cannot fight a problem we cannot name, and we cannot cure a disease by treating its symptoms. Seeking a deeper understanding of inequity, racism, and injustice requires different ways of seeing and appreciation for nuance and complexity.

Articles highlight various aspects of inequity at various levels. From stereotypes relating to gender bias and leadership and mechanisms to evaluate communication skills for Spanish-speaking populations.[22,23] A poignant piece by Wyatt et al who highlight how Black trainees and physicians experience racial trauma and retraumatization, compounding their grief and suffering during times where racial tension shapes broader sociopolitical narratives.[24] Another important piece highlights how Euro-centric discourse shapes practice that marginalizes and magnifies power asymmetry related to internationally educated health professionals.[25] The authors' words are a poignant reminder of how structural inequity is baked into our system. Their research resonates during a year when the pandemic exposed that not all members of our community enjoy the same privileges as most.

As we collectively grapple with how to advance justice while recognizing the complexity associated with the journey ahead, RIME articles also provide insights on how to move forward. For example, in their study on microaggressions, Bullock and colleagues highlight the importance of acknowledging and validating racial dynamics through brief check-ins and supportive action, once microaggressions occur in the clinical learning environment.[26] Such findings remind us that better is possible. However, we cannot address racism without naming it. We must validate the problem to avoid retraumatization, defer to the lead of those experiencing racial trauma in our communities, and commit to do the necessary work to advance justice through power and policy change.

Discussion

When disruption strikes, navigating the journey while ensuring that the core business of medical education remains intact has been challenging. Within this year's RIME supplement, we found several constructive tensions that provide useful guidance for medical education research and practice. We have synthesized these tensions in Figure 1 and profiled the above themes: normalizing help seeking during times of disruption and uncertainty, contextualizing the application of complex approaches to assessment, advancing and problematizing innovation, and recognizing the deeply embedded and systemic nature of inequities, are important to consider.

This year's RIME articles highlighted not only the inevitably of disruption, but researchers also noted that certain conditions can foster growth through such disruption. Central to facilitating such growth were trust in supervisory relationships, opportunities to practice skills while normalizing discomfort, and fostering help seeking.[3,5,7] Within the area of assessment, long-standing challenges can now be viewed through a different contextual lens. For example, building programs of WBA or frameworks to assess professionalism requires deep and meaningful engagement with assessors and learners to co-design new systems and approaches that are contextually specific.[10,14,15]

Co-design is also relevant when considering how advanced technology can be applied to the future of medical education. The RIME supplement highlights work related to AI and machine learning, while noting that innovations can be enhanced when past experiences are included in their application.[1] Overall, innovation and implementation require attention to dynamic and relational aspects of human and nonhuman interactions.[21]

Similarly, among articles related to equity and antiracism, dismantling systemic inequities is a not a straightforward task. RIME articles highlight the complexities and nuances-related academic medicine's journey to equity, diversity, inclusion, and belonging. Authors highlight the importance of understanding the deeply embedded nature of inequities in our systems of education, care delivery, and research, while providing guidance to faculty on how to name and validate inequities within clinical learning environments.[24–26]

Behind the dramatic headlines and news clips of the past year are the quiet acts of individuals who have been working diligently behind the scenes to advance

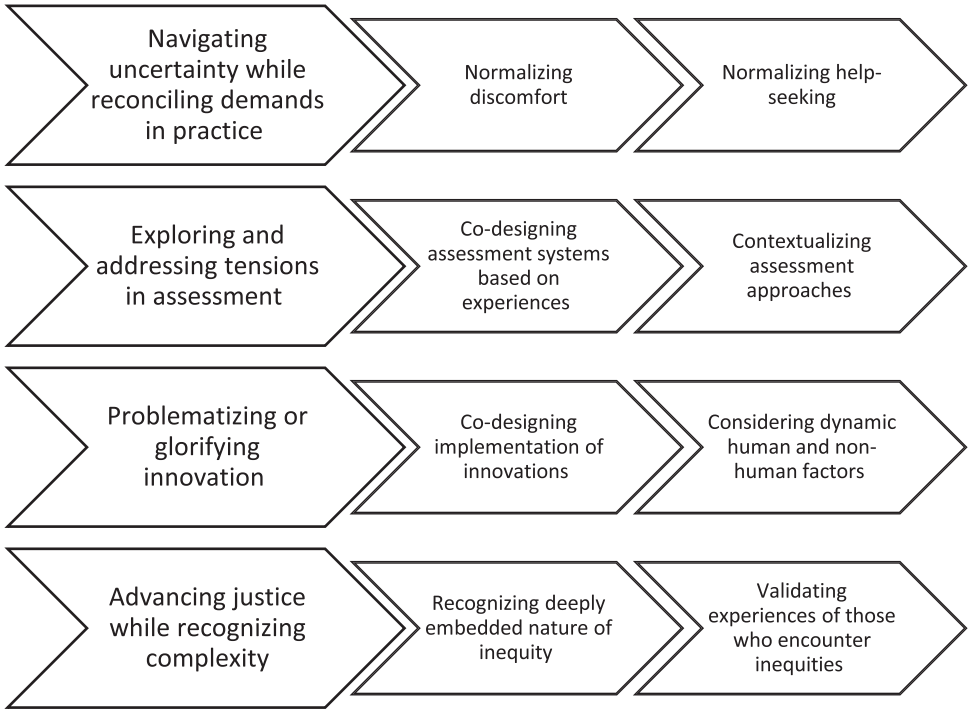

Figure 1 Lessons on advancing growth through constructive tensions within research in medical education.

inquiry in medical education. Although the events of 2020 and 2021 have created an indelible rupture in the fabric of RIME, our community is acutely aware that some things may change for the better. Long-held assumptions have been called into question. Different ways of seeing, learning, and knowing, will be needed for the journey ahead. This year's RIME supplement provides a glimpse into the future medical education. Our field can and will continue to grow through productive tensions that widen our inquiry, question our biases, and ask us to reflect on the enduring critical areas of scholarship in our field.

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