

Innovation—Defining Key Features for Medical Education Manuscripts

Arianne “Cuff” Baker, MD (@CuffBaker)
 Halah Ibrahim, MD, MEHP (@HalahlbrahimMD)
 Deborah Simpson, PhD (@debsimpson3)

You have just received a rejection email from a journal about your manuscript describing a new feedback technique implemented in your residency program. Disappointed, you review the submission guidelines for innovation manuscripts. As requested in the author instructions, the manuscript includes information on how the new approach addresses the problem of inadequate feedback, data on whether residents and faculty valued this approach, and the time and materials required to carry out the intervention. The editor’s rejection explanation states, “While feedback is vital and challenging, it is unclear what is innovative or novel about this approach.” You wonder, *what makes an idea sufficiently novel or innovative enough for publication?*

Though the terms *innovation*, *novel*, and *new* are used often in medical education, clarifying their meaning could support authors seeking to publish their work and journal reviewers evaluating manuscripts. High-quality innovations can drive our field forward. A new idea may precipitate a tipping point, “that magic moment when an idea, trend, or social behavior crosses a threshold, tips, and spreads like wildfire.”¹

Many journals publish innovations in medical education, each with specific submission categories and inclusion criteria,² but there is considerable variation in structure and details. In a recent systematic overview of published medical education innovations in health professional education journals, only 2 features were present in more than 90% of the 39 innovation articles audited (3 each from 13 medical education journals): the innovation report described a problem and described the actual or recommended implementation of the innovation.³

Prior to the publication of this overview, we analyzed the author instructions for more than 50 journals that publish manuscripts on medical education.⁴ We looked for any language in the category title or author instructions that used terms such as *new*, *novel*, *innovation*, *innovative*, or *leading/cutting-edge*. Our results? Although many journals used the terms *innovative* or *novel* in the author instructions,

fewer than half included specific categories for innovation, with substantial variability in word limits, structure, and guidelines (TABLE).

Defining Innovation in Medical Education

Having a shared understanding of innovation, one that is consistently used across all journals, would guide authors and reviewers in their assessments of manuscripts. For the *Journal of Graduate Medical Education* (JGME), innovations present a new solution to an existing problem in graduate medical education, of interest to others, with data on success and generalizability, including feasibility and sustainability. New ideas are more than something flashy; they should have the potential to solve real problems in ways that others might realistically be able to adopt.

Innovations must demonstrate new ideas or approaches to solving a problem, not just modifications of previous work in a new population or environment. For example, a feedback technique that describes a new communication model may be novel. Slight improvements to the same technique, or using it with a different group of trainees (eg, residents vs fellows; surgery vs internal medicine residents), may be an important replication study, but it is no longer an innovation. A new technology may be exciting, but if its role in a project simply duplicates prior paper-based work, it probably does not represent a novel solution.

The characteristics of high-quality innovation manuscripts overlap with those of typical research articles. They differ in that original research papers usually require large sample sizes, rigorous methodology, standard measurement instruments, and statistical analysis. Education innovations may have more limited outcomes with smaller sample sizes, single site or specialty settings, or shorter time of study. Innovation manuscripts should emphasize how the innovation solves a problem in a new way, shows value and acceptability to stakeholders, and is feasible, sustainable, and relevant to others.

Based on our analysis, we propose 6 common features to be considered in the writing and reviewing

DOI: <http://dx.doi.org/10.4300/JGME-D-22-00071.1>

TABLE

Examples of Journal Author Instructions for Innovation Submissions ≥ 1000 words

Journal	Category	Author Instructions for Innovation
<i>AEM Education and Training</i>	<i>Innovations Report</i> : Describes novel strategies for addressing common educational problems	Should include these sections: <ul style="list-style-type: none"> ▪ Need for Innovation ▪ Background ▪ Objective of Innovation ▪ Development Process ▪ Implementation ▪ Outcomes or Evaluation ▪ Reflective Discussion
<i>Academic Medicine</i>	<i>Innovation Reports</i> : Introduces a new approach to a challenge facing the wider academic medicine community or describes a local, novel, often cutting-edge approach that may be generalizable	The report (example of general criteria): <ul style="list-style-type: none"> ▪ Addresses an approach, topic, question, or problem important to the greater community ▪ Suggests next steps for addressing this challenge on a larger scale
<i>Academic Pediatrics</i>	<i>Scholarly Innovations</i> : Represents a new approach or the application of an established method/tool in a novel setting or context	Should be organized into these sections (word limits per section available online): <ul style="list-style-type: none"> ▪ What's New? Summarize innovation and outcomes ▪ Background ▪ Educational Approach and Innovation ▪ Results ▪ Discussion and Next Steps
<i>Journal of General Internal Medicine</i>	<i>Innovations</i> : Descriptions of innovative approaches to improving programs, including medical education, systems redesign, and practice management	Manuscripts should include: <ul style="list-style-type: none"> ▪ Introduction: A succinct problem description, prior evidence addressing solutions to this problem, and the aims of the innovation ▪ Setting and Participants ▪ Program Description ▪ Program Evaluation ▪ Discussion
<i>Teaching and Learning in Medicine</i>	<i>Educational Case Reports</i> : Presents detailed reflections on educational innovations	These articles document in-depth what was tried, why, and under what conditions and present a process and outcome analysis of impact as well as lessons learned
<i>Journal of Graduate Medical Education</i>	<i>Educational Innovation</i> : A description of a new approach or strategy in medical education that has been implemented and assessed <i>Brief Report</i> : A summary of a new curriculum, assessment, teaching method, or successful best practice that moves the field in a new direction or concerns a current "hot topic"	<i>Educational Innovation</i> : Manuscripts should answer the question: Should this innovation be tried (or avoided) in other settings or disciplines? Manuscripts should include: <ul style="list-style-type: none"> ▪ Information on feasibility (costs, time, materials, faculty training, technology) ▪ Information on acceptability to participants <i>Brief Report</i> : Submissions may have more limited outcomes, such as: <ul style="list-style-type: none"> ▪ A single setting ▪ Smaller number of trainees ▪ Single discipline ▪ Preliminary or self-reported outcome measures

of any medical education–related innovation manuscript (see the FIGURE).

An Approach to Writing and Reviewing Innovation Manuscripts

1. **Need:** Authors should describe the problem that the innovation addresses and explain its importance to

the medical education community. Just as research articles address a gap in the literature, innovations must address a problem faced by medical educators. Authors can overlook this step, as the novelty factor may distract from a true needs assessment.

2. **Literature Review:** As with any scholarly work, a literature review is crucial. Educators should

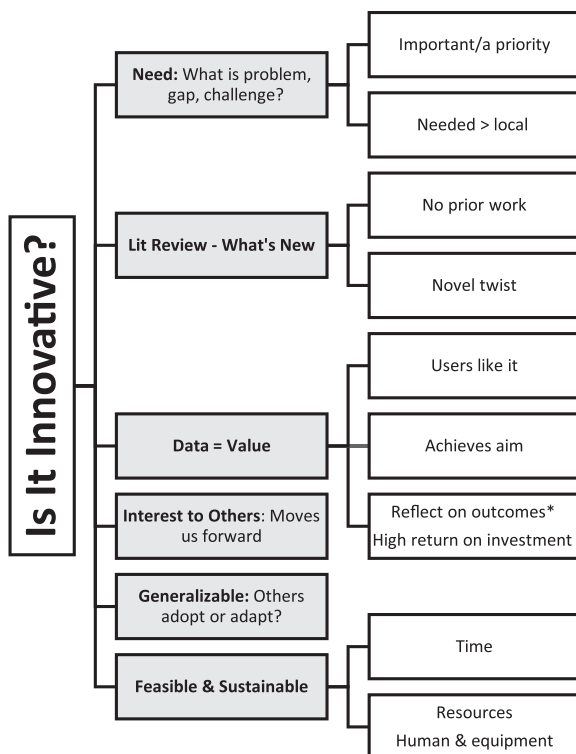


FIGURE
Features of Medical Education Innovations

explore how their innovation fits into the existing literature. Through personal experience, we know that a new and exciting idea may propel us into action before we have reviewed what has already been done, thus missing the opportunity for strengthening our work by building upon prior reports.

3. **Data=Value:** Evidence, whether derived from qualitative or quantitative methods, is key for all research and innovation articles. For innovations in particular, does the new approach solve the problem and add value to existing or past approaches? Data should include acceptability: learner, teacher, and other relevant stakeholder perspectives. If an innovation appears effective but participants hate it, it is unlikely to be sustainable.
4. **Interest to Others:** Projects that are of interest to others in medical education have the potential to change practice or move a discipline forward.
5. **Generalizable:** If the innovation can be utilized in only one local setting, it has limited value to others. For example, authors should address how simulating a novel surgical procedure in

one specialty is applicable to other procedure-oriented specialties.

6. **Feasible and Sustainable:** Innovations are less likely to last if they are not feasible. An innovation that requires significant time, human resources, or costs may be out of reach for others unless the resource needs decrease over time. Reporting specific resources expenditures is crucial for evaluating the feasibility of a new idea.

These features should guide you in writing a publication-worthy innovation manuscript. At JGME we have 2 article categories that explicitly call for novel ideas in medical education: Educational Innovation and Brief Report. We also publish an annual collection of New Ideas (<600 words). We will be using the 6 features listed above to strengthen our innovation-related submission instructions and reviewer guidelines. As medical education scholars, we will also use these recommendations to guide our innovation work and writing as we seek to find the next tipping point to advance the field.

References

1. Gladwell M. *The Tipping Point: How Little Things Can Make a Big Difference*. New York, NY: Little, Brown and Company; 2006.
2. Kanter SL. Toward better descriptions of innovations. *Acad Med*. 2008;83(8):703–704. doi:10.1097/ACM.0b013e3181838a2c
3. Colbert-Getz JM, Bierer SB, Berry A, et al. What is an innovation article? A systematic overview of innovation in health professions education journals. *Acad Med*. 2021;96(suppl 11):39–47. doi:10.1097/ACM.0000000000004293
4. Association of American Medical Colleges. Berry A. Annotated bibliography of journals for educational scholarship. Accessed July 25, 2021. <https://www.aamc.org/media/38166/download?attachment>



Ariane “Cuff” Baker, MD, is a Pediatric Emergency Medicine Fellow, Boston Children’s Hospital, and a Resident Editor, *Journal of Graduate Medical Education* (JGME); **Halah Ibrahim, MD, MEHP**, is Assistant Dean for Learning Communities and Associate Professor of Medicine, Khalifa University College of Medicine and Health Sciences, Abu Dhabi, United Arab Emirates, and Associate Editor, JGME; and **Deborah Simpson, PhD**, is Director of Education—Academic Affairs Advocate Aurora Health, Adjunct Clinical Professor of Family Medicine, University of Wisconsin School of Medicine and Public Health and Medical College of Wisconsin, and Deputy Editor, JGME.

Corresponding author: Ariane “Cuff” Baker, MD, Boston Children’s Hospital, arianne.baker@childrens.harvard.edu, Twitter @CuffBaker