

Resources for Clinicians Becoming Clinician Educators

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Early in my career I was lucky to work with terrific mentors and mentees. I am not always sure they were fortunate to work with me. With no formal training in education—other than as a learn-as-you-go piano and ballet teacher and teaching assistant in my youth—I might have benefited greatly from a crash course in educational theory and basic teaching skills. Forty years ago, medical teachers did not receive additional training in education. Back then, the PhDs listed on medical school and residency rosters represented basic scientists, not educators or social scientists. Now there are increasing numbers of medical school and residency program faculty with formal training in education and the social sciences.

I see this transition as a groundbreaking change in medical education, in contrast to the “flipped” classroom, which was the norm when I was in training, or simulation, which we called role play, or outcomes-based assessment, formerly labeled clinical skills examination. In my mind, a revolution has begun with the hiring and promoting of faculty with new educational skills and tools, acquired through formal and informal means. This departure from the past may result in more rational, evidence-based training programs. After all, whether used to acquire a new language, new science, or new craft, it is the same human brain that is engaged in the learning process. Medical teachers cannot afford to ignore the science and art of how humans learn.

Yet many current program directors, medical school teachers, and other clinician educators did not major in

education in college, nor will they have the finances and time to obtain an additional degree. Fortunately, it is not the initials after one’s name that are essential but the skill set. Although experiential learning is among the most powerful ways to learn, there are many terrific articles that can enhance one’s knowledge, and, if translated into practice, one’s skills as a teacher, program director, or educational researcher.

I have assembled a list of favorite articles to which I frequently refer faculty, fellows, and authors (TABLE). If you have submitted a paper to the *Journal of Graduate Medical Education*, it is likely that you have been referred to 1 or more of these articles. This list is not intended to be comprehensive, or to replace a systematic review of influential articles in medical education. Instead, these articles represent idiosyncratic choices that may provide a gentle nudge to start reading outside your clinical field to enhance your educator tool kit.

Since reading in a vacuum is not likely to be as helpful as focused reading, I suggest that articles be read when they pertain to an immediate need such that the information can be implemented quickly after reading. As with every other medical skill, teaching and research skills must be practiced and refined to be most effective.

Please send us your recommendations as well. Let us know what methods you have employed to enhance your performance as an educator. Happy reading!

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TABLE READING LIST FOR CLINICIAN EDUCATORS		
Topic	Article	Comments
Assessment	Davis DA, Mazmanian PE, Fordis M, Van Harrison R, Thorpe KE, Perrier L. Accuracy of physician self-assessment compared with observed measures of competence: a systematic review. <i>JAMA</i> . 2006;296(9):1094–1102.	Classic article: the least competent are often the most confident.
	Kirkpatrick DL, Kirkpatrick JD. <i>Evaluating Training Programs: The Four Levels</i> . 3rd ed. San Francisco, CA: Berrett-Koehler Publishers; 2006.	Post the 4 levels of evaluation in your office and teaching areas.
	Miller GE. The assessment of clinical skills/competence/performance. <i>Acad Med</i> . 1990;65(suppl 9):63–67.	Post Miller's pyramid in your office, too.
	Rickards G, Magee C, Artino AR Jr. You can't fix by analysis what you've spoiled by design: developing survey instruments and collecting validity evidence. <i>J Grad Med Educ</i> . 2012;4(4):407–410.	Surveys are popular outcome measures; with these preparatory steps, you can greatly improve the quality of results.
	Norman G. Likert scales, levels of measurement and the "laws" of statistics. <i>Adv Health Sci Educ Theory Pract</i> . 2010;15(5):625–632.	Yes, you can use parametric methods with data from Likert-type scales (ie, treat anchor numbers as actual numbers).
Feedback	Ende J. Feedback in clinical medical education. <i>JAMA</i> . 1983;250(6):777–781.	A classic and still a great place to start.
	Veloski J, Boex JR, Grasberger MJ, Evans A, Wolfson DB. Systematic review of the literature on assessment, feedback and physicians' clinical performance: BEME Guide No. 7. <i>Med Teach</i> . 2006;28(2):117–128.	Summarizes best practices from the literature.
	Sargeant J, Mann K, Sinclair D, van der Vleuten C, Metsemakers J. Challenges in multisource feedback: intended and unintended outcomes. <i>Med Educ</i> . 2007;41(6):583–591.	Methods to enhance credibility and use of multisource feedback.
	Cantillon P, Sargeant J. Giving feedback in clinical settings. <i>BMJ</i> . 2008;337:a1961.	A most effective and painless method (inviting learner self-reflection, validating, correcting). Similar to the Pendleton method and better than the "sandwich" technique.
	Ende J, Pomerantz A, Erickson F. Preceptors' strategies for correcting residents in an ambulatory care medicine setting: a qualitative analysis. <i>Acad Med</i> . 1995;70(3):224–229.	Powerful study explains why learners think they don't receive feedback.
Multimedia and online instruction	Hurtubise L, Martin B, Gilliland A, Mahan J. To play or not to play: leveraging video in medical education. <i>J Grad Med Educ</i> . 2013;5(1):13–18.	Practical pearls for using video in teaching.
	Mayer RE. Applying the science of learning to medical education. <i>Med Educ</i> . 2010;44(6):543–549. Mayer RE, ed. <i>The Cambridge Handbook of Multimedia Learning</i> . Cambridge Handbooks in Psychology. New York: Cambridge University Press; 2005.	Explains the relationship of visual presentation to learning. Essential reading for those who use PowerPoint.
	Cook DA, Levinson AJ, Garside S, Dupras DM, Erwin PJ, Montori VM. Internet-based learning in the health professions: a meta-analysis. <i>JAMA</i> . 2008;300(10):1181–1196.	Summarizes best practices.
Learning	Norman GR. The adult learner: a mythical species. <i>Acad Med</i> . 1999;74(8):886–889.	Challenges assumptions about adult learning theory and practice.
	Rohrer D, Pashler H. Learning styles: where's the evidence? <i>Med Educ</i> . 2012;46(7):634–635.	Challenges assumptions that tailoring teaching to learning styles has benefits.
	Kirschner PA, van Merriënboer JJ. Do learners really know best? Urban legends in education. <i>Educ Psychol</i> . 2013;48(3):169–183.	Challenges myths about the nature of learner, learning, and teaching.
Mentoring	Ludwig S, Stein RE. Anatomy of mentoring. <i>J Pediatr</i> . 2008;152(2):151–152.	Summary of mentor/mentee optimal characteristics based on a qualitative research approach.
	Sambunjak D, Straus SE, Marusic A. A systematic review of qualitative research on the meaning and characteristics of mentoring in academic medicine. <i>J Gen Intern Med</i> . 2010;25(1):72–78.	Description of successful mentoring based on a systematic review of literature.
Research in medical education	Cook DA. If you teach them, they will learn: why medical education needs comparative effectiveness research. <i>Adv Health Sci Educ Theory Pract</i> . 2012;17(3):305–310.	Explains why studies of interventions require a fair comparison group.
	Yarris LM, Deiorio NM. Education research: a primer for educators in emergency medicine. <i>Acad Emerg Med</i> . 2011;18(suppl 2):27–35.	The basics: a great introduction.
	Sullivan GM, Feinn R. Using effect size—or why the <i>P</i> value is not enough. <i>J Grad Med Educ</i> . 2012;4(3):279–282.	Always, always, report effect size.

TABLE READING LIST FOR CLINICIAN EDUCATORS (CONTINUED)

Topic	Article	Comments
Teaching	Bowen JL. Educational strategies to promote clinical diagnostic reasoning. <i>N Engl J Med.</i> 2006;355(21):2217–2225.	Nice introduction to a complex topic.
	Steinert Y. Student perceptions of effective small group teaching. <i>Med Educ.</i> 2004;38(3):286–293.	Qualitative study of teacher attributes that students find effective.
	Steinert Y, Mann K, Centeno A, Dolmans D, Spencer J, Gelula M, et al. A systematic review of faculty development initiatives designed to improve teaching effectiveness in medical education: BEME Guide No. 8. <i>Med Teach.</i> 2006;28(6):497–526.	Summarizes the little we know about this key area.
Validity and reliability	Cook DA, Beckman TJ. Current concepts in validity and reliability for psychometric instruments: theory and application. <i>Am J Med.</i> 2006;119(2):166.e7–166.e16.	This is a go-to source to understand sources of validity.
	Downing SM. Validity: on meaningful interpretation of assessment data. <i>Med Educ.</i> 2003;37(9):830–837.	An alternative go-to source for understanding current concepts of validity.
	Downing SM. Face validity of assessments: faith-based interpretations or evidence-based science? <i>Med Educ.</i> 2006;40(1):7–8.	Explains why you should no longer use the term <i>face validity</i> , period.
Writing	Norman G. Data dredging, salami-slicing, and other successful strategies to ensure rejection: twelve tips on how to not get your paper published. <i>Adv Health Sci Educ Theory Pract.</i> 2014;19(1):1–5.	An esteemed editor's advice, which should be followed.
	Sullivan GM. Writing education studies for publication. <i>J Grad Med Educ.</i> 2012;4(2):133–137.	The essential format for <i>Journal of Graduate Medical Education</i> research papers.