Beyond See one, do one, teach one: Developing Graduate Students and Medical Trainees as Medical Educators

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Introductions

Valerie O'Loughlin



IAMSE 2019 Webinar Series

Teri Turner



Question: How concerned are you about having enough qualified medical educators at your institution?

Answer and explain using the 'chat' function in the Webinar

Why is this type of training needed?

- Many medical-based PhD programs focus on molecular & cellular biology bench research, not on the teaching of medical disciplines
- Medical education is time-intensive, directs time away from faculty securing research funding
- Need faculty well versed in education methodologies, effective pedagogy (e.g., small group learning, active learning strategies), assessing curricular change
- End result: We don't have enough qualified medical educators to run our MedEd programs!

Example: Anatomy educators

- Early 2000's: recognition of U.S. (worldwide?) anatomy faculty shortage
 - Increasing anatomy PhD retirements
 - Transformation of anatomy department research to molecular/cellular biology
 - New medical schools forming
 - No longer a requirement for a PhD in Anatomy to learn all the anatomies (McCuskey et al., 2005)
 - People not qualified to teach (or invest the time to teach) the anatomies
 - 2005: McKuskey et al found 80% of anat dept leaders surveyed face 'moderate' to 'great' difficulty hiring individuals to teach gross anatomy
 - 2005: American Association of Anatomists symposium: Who will be the future anatomy educators?

Example: Anatomy educators

- Today: Does an anatomy educator shortage still exist?
- 2018: Rhodes et al. noted sessional (adjunct, temporary) anatomy instructors still commonly used in med ed as a stopgap measure
- 2019: study by Wilson et al. confirmed need for anatomy educators still great
 - 65% of anat dept leaders surveyed will have 'moderate' to 'great' difficulty hiring anatomy educators
 - 21% of 2017-2018 anatomy job postings never filled
- Shortage of anatomy educators still exists!

Rhodes D, Fogg QA, Lazarus MD. 2018. Dissecting the role of sessional anatomy teachers: A systematic literature review. *Anat Sci Educ* 11:410–426.

Wilson AB, Notebaert AJ, Schaefer AF, Moxham BJ, Stephens S, Mueller C, Lazarus MD, Katrikh AZ, Brooks WS.2019. A Look at the Anatomy Educator Job Market: Anatomists Remain in Short Supply. *Anat Sci Educ* https://doi.org/10.1002/ase.1895

One way to alleviate this shortage: train graduate (PhD) students as medical educators



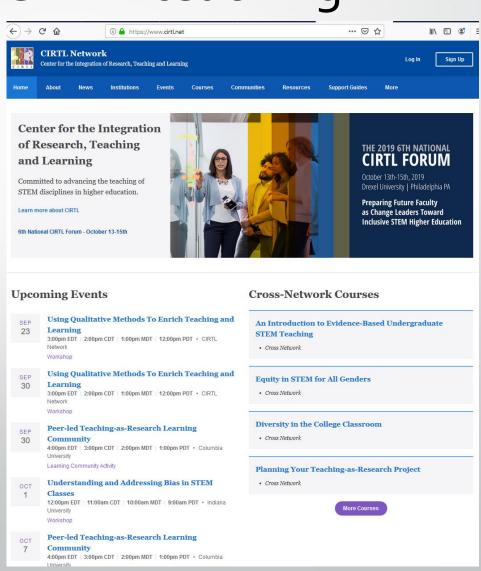
What are some ways you can develop medical educators in the PhD years?

- Develop programs that provide extensive teaching experience, discussion about pedagogy, learning theories, curricular development, education frameworks
- Collaboration and interaction with other medical/science educators
 - Other medical education programs
 - CIRTL (Center for Integration of Research, Teaching and Learning) https://www.cirtl.net/

CIRTL's mission: influence graduate-throughfaculty preparation in STEM teaching

- Numerous R1 institutions part of the consortium
- Online resources and classes, national meetings
- Establish learning communities re: teaching-as-research activities





Formal PhD programs to train medical educators

Anatomy education PhD Programs

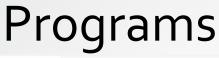
Examples of formal medical educator PhD



LSU: PhD in Clinical Anatomy



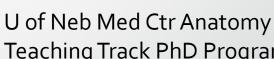
Western U Ontario PhD Clinical Anatomy



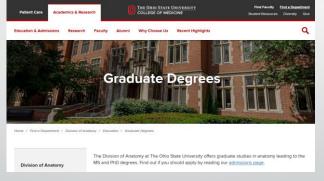


Univ. of Miss. PhD in Clinical Anatomy

U of Neb Med Ctr Anatomy Teaching Track PhD Program



DEPARTMENT OF GENETICS, CELL BIOLOGY AND ANATOMY



OSU COM PhD Educational Research Track in Anatomy



PennState COM Anatomy PhD



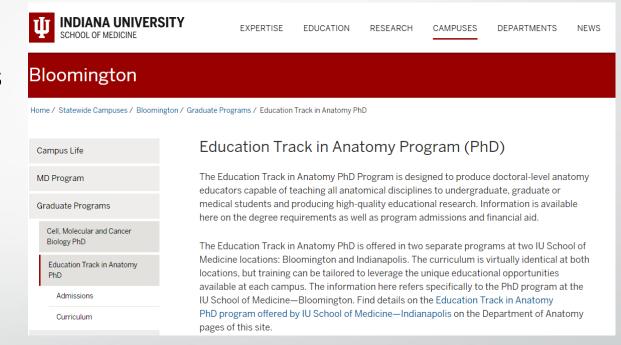
LECOM Anatomy Education PhD

AAA. 2019. American Association of Anatomists. Graduate Programs in Anatomy. American Association of Anatomists, Bethesda, MD. URL:

http://www.anatomy.org/graduate-programs-in-anatomy.html [accessed 9/17/2019]

Detailed Example: Education Track in Anatomy PhD at Indiana University School of Medicine

- Established in 2008
- Indianapolis & Bloomington Campuses
- 1-4 students accepted yearly
- "The goal of the Education Track in Anatomy PhD Program is to produce a cadre of doctoral-level anatomy educators who are capable of teaching all of the anatomical disciplines to undergraduate, graduate, and professional students, and who are capable of producing the high-quality educational research and other scholarly work necessary for promotion and tenure."



https://medicine.iu.edu/campuses/bloomington/graduate-programs/educational-track-in-anatomy-phd/

Brokaw JJ, O'Loughlin VD. 2015. Implementation of an education-focused PhD program in anatomy and cell biology at Indiana University: Lessons learned and future challenges. *Anat Sci Educ* 8:258–265.

Education Track in Anatomy PhD at IUSM

- Coursework in biomedical sciences, education, statistics
- Extensive and supervised teaching experience in the anatomies
- Students funded through graduate teaching assistantships
- PhD thesis on a medical (or anatomy) education research topic

Brokaw JJ, O'Loughlin VD. 2015. Implementation of an education-focused PhD program in anatomy and cell biology at Indiana University: Lessons learned and future challenges. *Anat Sci Educ* 8:258–265.

Table 1. Curriculum of the Education Track PhD Program in Anatomy and Cell Biology at Indiana University

Table 3. Dissertation Projects of Seven Doctoral Candidates in the Education Track PhD Program in Anatomy and Cell Biology at Indiana University, 2008–2014

Project title	Study type	Campus
Remediation trends in an undergraduate anatomy course and assessment of an anatomy supplemental study skills course (Schutte, 2013).	Mixed methods	Bloomington
Understanding interprofessional education: A multiple case study of students, faculty, and administrators (Henkin, 2013).	Qualitative	Indianapolis
A psychometric evaluation of script concordance tests for measuring clinical reasoning (Wilson, 2013)	Quantitative	Indianapolis
An exploration of reflective writing and self-assessments to explain professionalism lapses among medical students (Hoffman, 2014).	Mixed methods	Indianapolis
Does time matter? A search for meaningful medical school faculty cohorts (Guillot, 2014).	Quantitative	Indianapolis
Improving undergraduate anatomy laboratory grades and study skills through teaching visual literacy and observation skills (in progress).	Mixed methods	Bloomington
Embryology in the medical curriculum: Past and current practices (in progress).	Mixed methods	Bloomington

Elective courses and Research (28 credit hours)

Elective courses selected in consultation with student's advisory committee, such as: (1) Special topics in anatomy (cr. arr. f; supervised readings course with faculty mentor (may be repeated for credit); (2) educational research practicum (2 hours); supervised research experience with faculty mentor (may be repeated for up to 6 hours total); (3) additional courses in biomedicine, education, or statistics

Dissertation Research (cr. arr.); sufficient to complete the 90 credit hour degree requirement

What <u>strategies are successful</u> in developing a formal medical education PhD program?

- Buy-in from faculty in your departments and leadership at all levels of administration
 - Point to successes of other education-based programs mentioned here
- Working knowledge of the approval process for a degree
 - Ex: can your new degree be a track in an existing degree? Lessens the bureaucratic hurdles
- Collaboration/involvement with School of Education Faculty (if your institution has a school)
- Emphasis that the degree and thesis is on research (medical education research) and not 'just a teaching degree'

What <u>challenges</u> are there in developing and sustaining medical education PhD programs?

- Buy-in from bench researchers and others concerned that the degree is 'non-science'
- Bureaucracy of getting a graduate program approved
 - At least 1-2 years from inception to approval
- Funding of the graduate students
- Advisors/mentors who are well-versed in education research thesis projects

What <u>rewards</u> are there for faculty and PhD students who participate in these medical educator programs?

- Your program/students highlighted as trailblazers in the field
- Graduates likely will be highly sought after in the work force
- Students bring enthusiasm and new ideas for innovative teaching and inspire you to innovate your teaching
- PhD thesis projects can evaluate your program's curricular reform, teaching innovations, etc.
- You are helping fulfill the need for well-qualified medical educators, & are helping shape future medical education

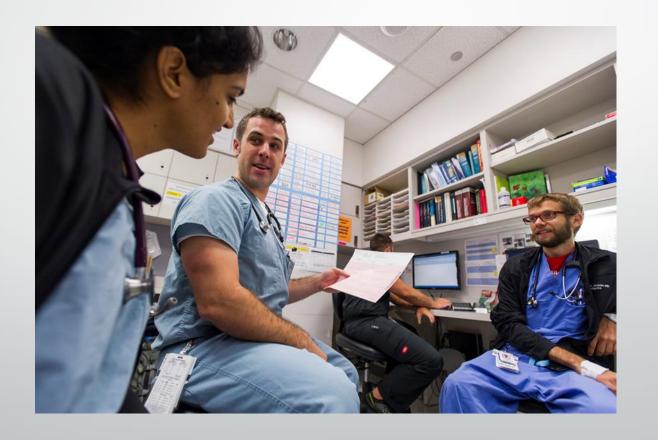
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- AAA. 2019. American Association of Anatomists. Graduate Programs in Anatomy. American Association of Anatomists, Bethesda, MD. URL: http://www.anatomy.org/graduate-programs-in-anatomy.html [accessed 9/17/2019]
- Albertine K. 2008. Creating a teacher-scholar training program for anatomy at the University of Utah School of Medicine. FASEB J 22:241.4.
- Brokaw JJ, O'Loughlin VD. 2015. Implementation of an education-focused PhD program in anatomy and cell biology at Indiana University: Lessons learned and future challenges. Anαt Sci Educ 8:258–265.
- CIRTL (Center for Integration of Research, Teaching and Learning) https://www.cirtl.net/
- Malamed S, Seiden D. 1995. The future of gross anatomy teaching. Clin Anαt 8:294–296.
- McCuskey RS, Carmichael SW, Kirch DG. 2005. The importance of anatomy in health professions education and the shortage of qualified educators. Acad Med 80:349–351.
- Rhodes D, Fogg QA, Lazarus MD. 2018. Dissecting the role of sessional anatomy teachers: A systematic literature review. Anat Sci Educ 11:410–426.
- Schaefer AF, Wilson AB, Barger JB, Azim HM, Brokaw JJ, Brooks WS. 2019. What does a modern anatomist look like? Current trends in the training of anatomy educators. *Anαt Sci Educ* 12:225–235.
- Wilson AB, Notebaert AJ, Schaefer AF, Moxham BJ, Stephens S, Mueller C, Lazarus MD, Katrikh AZ, Brooks WS.2019. A Look at the Anatomy Educator Job Market: Anatomists Remain in Short Supply. *Anat Sci Educ* https://doi.org/10.1002/ase.1895

Q&A period: 5 minutes

- Please type your questions in the chat box of the webinar
- Note that we will have additional time for questions at the end of the webinar
- We will provide written answers to questions that were not addressed in the chat or webinar

Part 2 – Students, residents and fellows as clinical teachers and medical educators

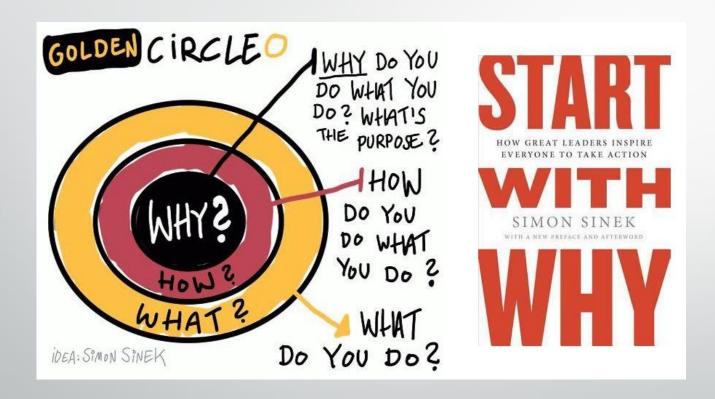


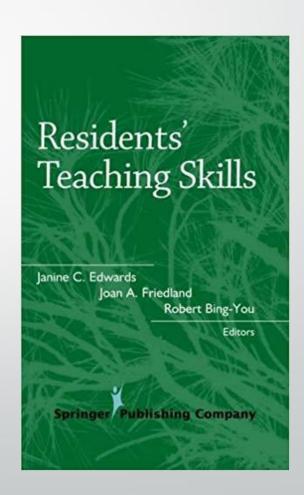


Reflection Question – Why did you become an educator? Why do you teach?



Start with Why



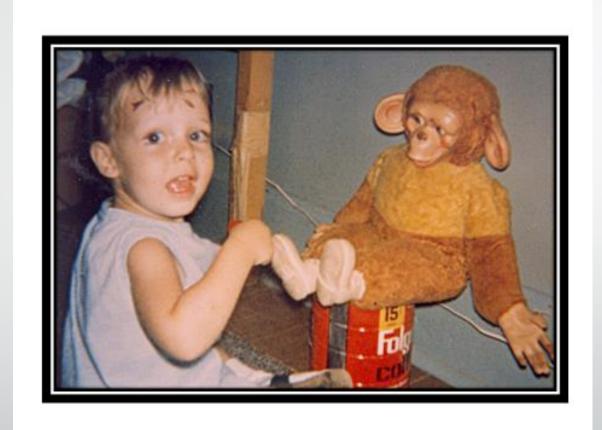


"... But a role model in the flesh provides more than inspiration; his or her very existence is confirmation of possibilities one may have every reason to doubt, saying, "Yes, someone like me can do this."

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SONIA SOTOMAYOR

Observational (Social) Learning



Bandura A. (1986). Social foundations of thought and action. A social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall.

Predominance of Learning through Role-Modeling in the Clinical Environment

- More profound learning in the implicit curriculum
 - \triangleright 5 out of 6 ACGME CLER focus areas only health care quality learned more explicitly
- Learning hindered by what was not seen
- Passive enculturation and culture (Trainees "picked" things up)
- Residents do not know how to role model effectively we must teach this skill
 - Balmer, DF., et al. "Learning across the explicit, implicit, and extra-curricula: an exploratory study of the relative proportions of residents' perceived learning in clinical areas at three pediatric residency programs." Academic Medicine. 2015.
 - 2. Sternszus R, et al. Resident Role Modeling: "It Just Happens". Academic Medicine. 2016 Mar 1;91(3):427-32.
 - 3. Sternszus R, et al. Evaluating a novel resident role-modelling programme. The clinical teacher. 2018 Jun;15(3):252-7.

Professional Identity Formation and Roles of the Clinical Teacher

The Teacher Role

Instructor as a Person

Clinician Teacher

The Physician Role

The Supervisor Role

- . Ullian JA, Bland CJ, Simpson DE. An alternative approach to defining the role of the clinical teacher. Academic Medicine .1994 Oct;69(10):832-8.
- 2. Cruess RL, et al. A schematic representation of the professional identity formation and socialization of medical students and residents: a guide for medical educators. Academic Medicine. 2015 Jun 1;90(6):718-25.

doc·tor (däk-tər) n.
1. teacher (latin)

Teacher Identity

- Incoming interns scored quite high (4.16/5.0) on global teacher identity
- Learning orientation to become a better teacher
- Males scored higher than females (?? Imposter syndrome??)
- Intrinsic satisfaction with teaching lower in specialties with less patient interaction
- If they participated in a Students-as-Teachers program they scored higher
 - .. Sherman S. et al unpublished data
 - 2. Starr S, et al. Initial testing of an instrument to measure teacher identity in physicians. Teaching and learning in medicine. 2006 Apr 1;18(2):117-25.



- One-third of a medical student's fund of knowledge directly attributable to residents¹
- Students learn as least as well when taught by peers²
- Exposure to role models may influence career/specialty choice 3
- Positive links to clinical skills⁴
- 1. Post RE, et al. Residents-as-teachers curricula: a critical review. Academic Medicine. 2009 Mar 1;84(3):374-80.
- 2. Benè KL, Bergus G. When learners become teachers. Family medicine. 2014 Nov;46:783-7.
- 3. Linderman WF, et al. Near-Peer Teaching Outreach Programs to Increase Minority Physician Recruitment. Journal of Academic Ophthalmology. 2018 Jan;10(01):e122-6.
- 4. Smith CC, et al. Those Who Teach, Can Do: Characterizing the Relationship Between Teaching and Clinical Skills in a Residency Program. Journal of graduate medical education. 2018 Aug;10(4):459-63.

Attitudes and Motivation to Teach

- Faculty: altruistic "to give back," inspiration from prior teachers, desire to recruit¹
- Residents²:
 - Enthusiasm (54%) committed to and makes time to teach; they want to get better
 - Reluctance (20%) feel overwhelmed with clinical duties and perceive little reason to teach
 - Rewarded (12%) externally motivated by rewards to teach but generally share negative attitudes about teaching
 - Dahlstrom J, et al. What motivates senior clinicians to teach medical students?.
 BMC Medical Education. 2005 Dec;5(1):27.
 - Dotters-Katz S, et al. What motivates residents to teach? The Attitudes in Clinical Teaching study. Medical education. 2016 Jul;50(7):768-77.

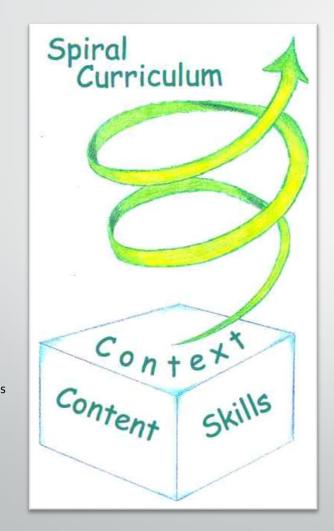




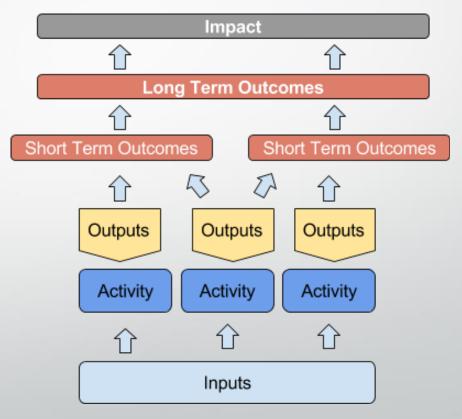
"Anybody who believes that all you have to do to be a good teacher is to love to teach also has to believe that all you have to do to become a good surgeon is to love to cut."

L. Mansnerus. The New York Times. November 7, 1993: Section 4A

Curricular Best Practices



Logic Model



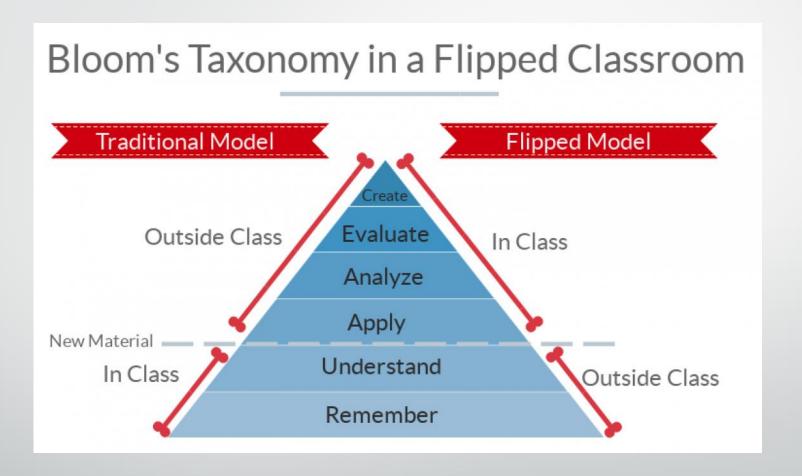
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https://www.aacu.org/sites/default/files/LogicModel.pdf

Curricular Resources

- Rana J, et al. Defining curricular priorities for student-as-teacher programs: A National Delphi Study. Medical teacher. 2018 Mar 4;40(3):259-66.
- Freret T, et al. Twelve tips for implementation of "student-as-teacher" programs. Medical teacher. 2017 Dec 2;39(12):1221-6.
- Krzyzaniak SM, et al. Curated collections for educators: five key papers about residents as teachers curriculum development. Cureus. 2018 Feb;10(2).
- McKeon BA, et al. A Consensus Guideline to Support Resident-as-Teacher Programs and Enhance the Culture of Teaching and Learning. Journal of graduate medical education. 2019 Jun;11(3):313-8.
- Ramani S, et al. Residents as teachers: Near peer learning in clinical work settings: AMEE Guide No. 106. Medical teacher. 2016 Jul 2;38(7):642-55.
- Turner T, et alM. The clinician-educator's handbook. MedEdPORTAL. 2010;6:7749. https://doi.org/10.15766/mep_2374-8265.7749

Power of the Flipped Classroom



- . Chokshi BD, et al. A "resident-as-teacher" curriculum using a flipped classroom approach: can a model designed for efficiency also be effective?. Academic Medicine. 2017 Apr 1;92(4):511-4.
- Burgess A, et al. Peer teacher training (PTT) program for health professional students: interprofessional and flipped learning. BMC medical education. 2017 Dec;17(1):239.

Innovations

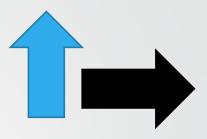
- Awards and Recognition
- Teaching Up and Teaching Across
- Leveraging the Power of Role Models
- Electives/Rotations/Advanced Degrees and Tracks
- Observation, Feedback and Peer to peer coaching







- Medical Student Teaching Competition¹
 - First round open to all, 8 finalists paired with a teaching coach with 1 month to prepare, judged on teaching excellence
- TED Masterclass teaching excellence competition
- Academy of Distinguished Resident Educators²
 - Modeled after Faculty Academies, criterion-based, peer-reviewed, teaching portfolio
- Academic designation as "Clinical Instructors" in the medical school³
 - DeSimone A.K. et al. Encouraging Student Interest in Teaching Through a Medical Student Teaching Competition. Academic Medicine. 2017 Aug;92(8):1128
 - 2. Moza R. et al. Academy of Resident Educators: A Framework for Development of Future Clinician-Educators. JGME. 2015 June:7(2):294-5.
 - 3. McBride JM, Drake RL. Rewarding the resident teacher. Anatomical sciences education. 2011 Jul;4(4):227-30.

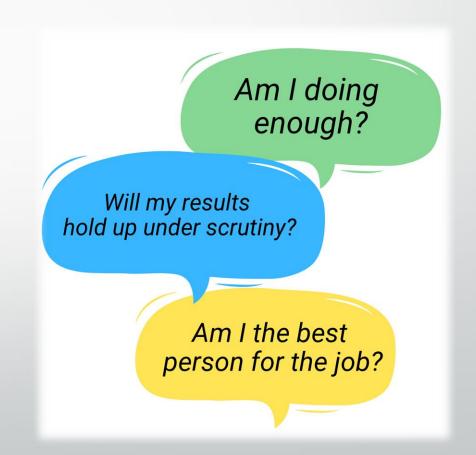


Teaching "Up" and Teaching "Across"

- 5-10 minute teaching by 3rd year medical students to junior surgery residents¹
 - Students as effective as chief surgery residents at teaching core knowledge
 - 83% agreed that it should be replicated on other rotations
- Residents teach community faculty²
- Interdisciplinary resident-to-resident didactic series³
 - Effective for building collaboration as well as knowledge
- Residents teaching about pediatric communication skills at Chiropractic College
 - 1. Wirth K, et al. Is there a place for medical students as teachers in the education of junior residents?. The American Journal of Surgery. 2014 Feb 1;207(2):271-4.
 - 2. Ruano CE, et al. Reverse Educational Distance: Exploring a novel concept to enhance Resident-As-Teacher curricula. Medical teacher. 2019 Apr 13:1-7.
 - 3. Warren MB, et al. Residents Teaching Residents: Results of an Interdisciplinary Educational Endeavor. Academic Psychiatry. 2018 Aug 1;42(4):473-6.

Overcoming the Barriers of Teaching "Up"

- Ensuring adequate preparation and support
- Presenting content on evidence-based strategies (instead of topics relying on prior clinical experience)
- Debunking myths





Leveraging the Power of Role Models

- Professionalism¹
 - Senior medical students who were identified by classmates as role models
 - Near-peer led discussion-based small groups psychologically safe environment
 - Near-peers directly influenced the behavior of the junior medical students
- Quality improvement education²
 - Students passionate about QI and patient safety
 - Developed and led workshops
- Teaching residents how to teach
- Cusimano MC, et al. . Medical Students Learn Professionalism in Near-Peer Led, Discussion-Based Small Groups. Teaching and learning in medicine. 2019 May 27;31(3):307-18.
- . Shah KP, et al. Medical students as teachers: hands-on quality improvement education. Medical education. 2017 Nov;51(11):1177-8.

Social and Cognitive Congruence

"[Senior students] are more approachable and much less scary. They've gone through it, and they are really sympathetic about it. They say 'You guys are probably going through this' and we are!"

"...it's a lot easier to relate to someone who is just two years ahead of you than to an attending."

"I recall feeling [senior students] were nearer to me as role models and I really valued the advice that they gave."

- 1. Cusimano MC, et al. . Medical Students Learn Professionalism in Near-Peer Led, Discussion-Based Small Groups. Teaching and learning in medicine. 2019 May 27;31(3):307-18.
- 2. Sternszus R, et al. Evaluating a novel resident role-modelling programme. The clinical teacher. 2018 Jun;15(3):252-7.

Electives/Rotations/Tracks/Degrees



- Student as Teacher elective¹
- Resident as Teacher rotation (additional to the Resident-as-Teacher curriculum)²
 - Elective or Required rotation (Supervising and Teaching as Residents with Safety [STaRs])
- Scholars Track^{3,4,5}
- Fellowship in Medical Education (With or without obtaining an advanced degree in education (M.Ed. or equivalent)
 - 1. Yoon MH, et al. Medical Students' Professional Development as Educators Revealed Through Reflections on Their Teaching Following a Students-as-Teachers Course. Teaching and learning in medicine. 2017 Oct 2;29(4):411-9.
 - 2. Mann KV, et al. Twelve tips for preparing residents as teachers. Medical teacher. 2007 Jan 1;29(4):301-6.
 - 3. Ahn J, et al. The graduate medical education scholars track: developing residents as clinician—educators during clinical training via a longitudinal, multimodal, and multidisciplinary track. Academic Medicine. 2018 Feb 1;93(2):214-9.
 - 4. Smith CC, et al The clinician—educator track: training internal medicine residents as clinician—educators. Academic Medicine. 2014 Jun 1;89(6):888-91.
 - 5. Coleman MM, et al Preparing students to be academicians: a national student-led summer program in teaching, leadership, scholarship, and academic medical career-building. Academic Medicine. 2012 Dec 1;87(12):1734-41.

Observation, Feedback, and Peer to Peer Coaching

- Observed Structured Teaching Encounter
- Teaching observation checklist
- Audiotape or videotape teaching
- Peer coaching



Evaluation Tools

- **OSTE:** Morrison E. An Objective Structured Teaching Examination (OSTE) for generalist resident physicians. MedEdPORTAL. 2005;1:103. https://doi.org/10.15766/mep_2374-8265.103
- Observational checklist of bedside teaching: Ilgen JS, et al. Back to the bedside: the 8-year evolution of a resident-as-teacher rotation. The Journal of emergency medicine. 2011 Aug 1;41(2):190-5.
- Peer observation of teaching tool: Pazo VC, et al. Peer teaching of the physical exam: a pilot study. The clinical teacher. 2018 Oct;15(5):393-7.
- Teacher Identity Scale: Starr S, et al. Initial testing of an instrument to measure teacher identity in physicians. Teaching and learning in medicine. 2006 Apr 1;18(2):117-25.
- Entrustable Professional Activity: Teach, provide feedback, and assess learners across a competency-based medical education continuum and engage in interprofessional education.

https://www.abp.org/sites/abp/files/pdf/phm_epa_6.pdf

Reflection Question – What are other innovations (your own or someone else's) would you like to share?

Answer using the 'chat' function in the Webinar

MedEdPORTAL Resources

- Meredith S, Greenberg L, Blatt B. Resource to develop medical students into peer mentors. MedEdPORTAL. 2014;10:9691. https://doi.org/10.15766/mep_2374-8265.9691
- Brown LE, Rangachari D, Melia M. Beyond the sandwich: from feedback to clinical coaching for residents as teachers. MedEdPORTAL. 2017;13:10627.
 https://doi.org/10.15766/mep_2374-8265.10627
- Khidir A, Alhammadi A, Wagdy M, Mian M. Sharing the light: teaching different levels of learners. MedEdPORTAL. 2016;12:10388.
 https://doi.org/10.15766/mep_2374-8265.10388
- Tews M, Quinn-Leering K, Fox C, Simonson J, Ellinas E, Lemen P. Residents as educators: giving feedback. MedEdPORTAL. 2014;10:9658.
 https://doi.org/10.15766/mep_2374-8265.9658
- Newman L, Tibbles C, Atkins K, et al. Resident-as-teacher DVD series.
 MedEdPORTAL. 2015;11:10152. https://doi.org/10.15766/mep_2374-8265.10152

Q&A period

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- We will provide written answers to questions that were not addressed in the chat or webinar

Thank you!





