

CENTER FOR RESEARCH ON LEARNING AND TEACHING (CRLT)
FACULTY DEVELOPMENT FUND
 BUDGET SHEET

Project Director: Daniel T. Cronin Project Title: Empowering Educators: The MENTOR Series

- Clearly explain why each requested budget item is **essential to the success** of the project. **Travel and conference attendance, in particular, require substantial justification.**
- **Grant monies must be used for project costs that do not fall within the realm of regular departmental expenditures.** Requests should not include items that departments normally make available to faculty, such as photocopying, supplies, and routine secretarial assistance.
- **When budgeting salary, be sure to account for necessary fringe benefits, in accordance with your unit's policies and procedures.**

Line Item	Amount Requested**	College/Dept. Cost Sharing (if applicable)	Justification
1. Group Interview Food Money	\$1,500		A key to the user experience and design of our resource is in medical student group interviews. Each group interview will have 25 medical students, and we anticipated at least three iterative group interviews with food and drink costing approximately \$15 per student.
2. Video Production Costs	\$4,000		The creation of one animated summary video in entirety costs \$2,300. The production of one core content video in entirety costs approximately \$600. Additional editing and re-filming based off group interview feedback may cost anywhere from \$100 to \$2,000. Therefore, the total video production cost to film one alternate animated summary video and one alternate core content video, plus additional editing equals approximately \$4,000 (\$2,300 + \$600 + ~\$1,100).
3. Infographic Production Costs	\$1000		Infographics have a wide range of production costs. Although they typically range between \$500-\$1,500 for a single infographic, the Principal Investigator of this grant has some familiarity with Adobe Illustrator which can offset production costs by contributing to infographic design. We will produce two infographics minimally for the purpose of feedback on design.
Total	\$6,500		

**The budget request for CRLT funds should not exceed \$6,000.00 for the smaller projects or \$10,000.00 for the larger projects.

PROJECT STATEMENT

Teaching is fundamental to the role of physicians as we must digest, synthesize and effectively communicate complex information to patients, learners and colleagues. More specifically, the role of residents as teachers is critically important as evidenced by studies showing that approximately one third of medical student knowledge is attributable to resident teaching, that residents spend 20% of their time teaching, and that residents who teach retain more knowledge.³⁻⁸ Therefore, training residents and medical students to teach (before they become residents) has become an increasingly important component of curricular efforts at the University of Michigan and nationally. In the current curriculum at the University of Michigan (of which the Principal Investigator is the medical school's faculty lead), barriers to teaching medical students to teach include a lack of scalability, lack of curricular flexibility, and lack of accessibility. To overcome these barriers, this grant team is creating a new resource, the **M**edical **E**ducators **N**ovel **T**eaching **O**n-demand **R**esource (MENTOR) Series, focused on teaching physicians and medical trainees how to teach.

The MENTOR Series will be the first-of-its-kind central repository of teaching best practices in medical education. It will consist of primarily video-based content supplemented by infographics. The evidence-based content will be created by various experts at Michigan Medicine spanning multiple disciplines, and produced with hired videographers, video editors and artists. Its structure allows use as both a curricular tool and an on-demand resource. The structure of this resource is described here-in. The resource will focus on twelve foundational topics in medical education (Table 1).

Table 1. Foundational Topics of the MENTOR Series

Foundational Topics of the MENTOR Series		
Effective Feedback	Clinical Preceptorship	Assessment
Chalk Talks & Small Groups	Presentation Best Practices & Graphic Design	Motivating Learners & Leading Teams
Procedural & Surgical Teaching	Presenting the Sciences	Learning Theories
Coaching	Mentorship	Simulation Best Practices

Each of these twelve foundational topics will have their own “mini-series.” The structure of each mini-series is displayed visually in Figures 1 and 2 (Appendix A). Briefly, each mini-series will have an introductory video (“title package”), three to ten concise “core-content” videos, a five-minute summary video, and a summary infographic. This structure allows viewers to focus on high-yield summaries of key points, while simultaneously providing the means for learners to gain a greater depth and breadth of understanding for each topic. An additional, noteworthy feature of this resource is that it will be searchable, similar to UpToDate. For example, although resources on “Effective Questioning” will be located within the “Clinical Preceptorship” mini-series – users will also be able to find resources on “Effective Questioning” through a search bar on the website.

This proposal focuses specifically on two aims:

Aim 1: Optimize medical students’ user experience of the MENTOR Series and design through iterative, qualitative feedback.

Aim 2: Evaluate medical students' satisfaction, perceived merit and efficacy of the resource as an instructional tool for the new "Clinical Teaching Elective" for senior medical students

Before describing the Aims further, it is important to note that the production of the MENTOR Series will in large part be funded by the awarded University of Michigan GME Innovations Grant. This grant will cover \$70,000 of video production costs, \$10,000 of infographic production costs, \$10,000 of evaluation costs from residents (focus group food and survey incentives), and \$9,000 for website production. As such, the aforementioned awarded grant covers costs of production and iterative feedback from residents only – the budget does not allow for iterative feedback/evaluation from our other core target audience – medical students.

PROJECT EVALUATION PLAN

Aim 1: Over the course of three months we will obtain iterative feedback using medical student group interviews for three specific types of educational components within the resource: 1) Core-Content Videos, 2) Summary Videos, and 3) Summary Infographics. We will do this iteratively with core-content videos, summary videos, and summary infographics. During each group interview attendees will watch four full-length videos. Specifically, we will show a set of two "Core-Content Videos" and a set of two "Summary Videos." Each "Core-Content Video" shown will have identical topics, but will use different video styles (i.e. frequency of B-Roll usage, type of B-Roll footage, style of graphics, frequency of text appearance, etc.). Similarly, each "Summary Video" shown will have identical content but use different animation styles. Finally, we will also seek feedback on styles of summary infographics with each group interview. Each group interview will cap at 25 people. After viewing each set of videos or infographics, all participants will fill out an in-person survey (sample in Appendix B) and then will be asked questions guided by a semi-structured interview with sample questions in Appendix C.

After initial feedback we will make adjustments and then obtain further feedback (an iterative model) from additional group interviews. Depending on the nature of the feedback, this may easily require greater than three sessions. The iterative feedback sessions will be discontinued once it is determined by the group interview attendees and the grant team members that the design and content delivery of our Core-Content Videos, Summary Videos and Summary Infographics are adequately meeting our learners' needs and optimizing their experience.

Aim 2: The "Clinical Teaching Elective" will be a new four-week pilot elective course within the University of Michigan Medical School Branches (the senior medical student curriculum). We anticipate piloting 3-6 students over the course of six months. The structure is that a fourth year medical student will join an inpatient hospital team composed of an attending, senior resident, interns and clerkship students, and will have both clinical and teaching duties. The student will follow a smaller number of patients than is expected of most fourth year medical students, and will have additional teaching duties. During their first week they will learn how to teach in the clinical setting by watching mandatory videos and reading infographics from the MENTOR Series. In the remaining three weeks, the student will complete required teaching experiences with real-time feedback on their teaching elicited from their team members. At the end of the rotation, each pilot student will complete a retrospective pre-post questionnaire as displayed in Appendix C. After our complete pilot phase we will hold a focus group with the participants to

ascertain their evaluation of using the MENTOR Series as an instructional tool during their “Clinical Teaching Elective.”

After completion of Aim 1 and Aim 2, next steps in the production of the MENTOR Series will be to further optimize the user experience of the website, add additional content (including possibly an additional mini-series) and develop a mobile application. After obtaining feedback for the MENTOR Series from the Clinical Teaching Elective, we plan to also implement select videos from the resource for senior students in two additional contexts. The first is in training the medical school’s near-peer mentors for their various mentorship roles, for which the Principal Investigator is a faculty lead. The second is in asynchronously teaching students in the “Path of Excellence for Scholarship in Learning and Teaching” (approximately fifty students), for which this grant’s Principal Investigator will co-lead as of January 2020. These curricular plans exemplify the multiple avenues of curricular integration available for the MENTOR Series. We anticipate that this flexibility, in combination with the high production value afforded by this grant’s iterative feedback model, will result in a positively received and durable curricular element that appeals to medical students and effectively fills curricular gaps.

KEY INVESTIGATOR BIOGRAPHIES

Daniel Cronin, MD (PI) is a hospitalist and Assistant Professor of Medicine at the University of Michigan Medical School (UMMS) and VA Ann Arbor Healthcare System (VAAHS). He is Director of Students as Educators for UMMS, and has created highly-regarded resident-as-teacher curricula for both UMMS and the University of Michigan Internal Medicine Residency. Additionally, he is a graduate of the Medical Education Scholars Program, and has won multiple teaching awards. He will be involved in content creation, video design, directing the Clinical Teaching Elective, and leading the student group interviews.

Michelle Daniel, MD, MHPE (Co-I) is an emergency medicine physician, Associate Professor of Emergency Medicine and Learning Health Sciences, and Assistant Dean for Curriculum at UMMS. She has particular interest and scholarly publication in best practices for didactic knowledge transfer. She is currently pursuing her PhD in education. She will be involved in content creation and will play a critical role in approval and implementation of the Clinical Teaching Elective.

Seetha Monrad, MD (Co-I) is a practicing Rheumatologist, Associate Professor of Medicine and Learning Health Sciences, and Assistant Dean for Assessment, Evaluation and Quality Improvement at UMMS. She has expertise in assessing learners and evaluating programs. She will be involved in content creation.

Gurjit Sandhu, PhD (Co-I) is an Associate Professor in the Education Research Sciences Collaborative in the Departments of Surgery and Learning Health Sciences. She is the director of the residents-as-teacher program for the UMMS General Surgery residency and has scholarly interest in training surgeons to teach, effective questioning, and measuring educational outcomes. She is adept in both qualitative and quantitative research. She will be involved in content creation.

Vineet Chopra, MD (Co-I) is a hospitalist, Associate Professor of Medicine, Chief of the Division of Hospital Medicine at UMMS, and co-director of the Patient Safety Enhancement Program (PSEP). He is a highly productive research scientist, having published over 200 peer-reviewed articles. He has also won numerous teaching awards and has expertise in teaching optimal mentorship and menteeship. He will be involved in content creation.

Robert Dickson, MD (Co-I) is an Assistant Professor in the Division of Pulmonary and Critical Care Medicine at UMMS and the Associate Program Director for Research for the Pulmonary and Critical Care Medicine Fellowship Program. He is a successful basic and translational research scientist, has been awarded multiple teaching awards, and routinely teaches scientific communication to students, house officers, and faculty. He will be involved in content creation.

Rana Kabeer, MD (Co-I) is an emergency medicine resident at Stanford University School of Medicine. He has a special interest in videography, video editing and using video mediums for education. His video skills combined with his medical training help promote optimal video design for medical education. He will be involved in the video storyboarding and design process.

Amit Gupta, MD (Co-I) is a gastroenterology fellow in the Department of Internal Medicine at UMMS. He co-developed resident-as-teacher curricula for the University of Michigan Internal Medicine Residency, has taught numerous sessions on teaching, has won multiple teaching awards, and is currently pursuing a Master of Health Professions Education. He will be involved in content creation.

Nathan Houchens, MD (Co-I) is an Assistant Professor of Medicine in the UMMS Department of Internal Medicine, is an Assistant Program Director of the Internal Medicine residency and Associate Chief of Medicine at the VAAHS. He has scholarly publications and expertise in teaching on inpatient wards. He will be involved in content creation.

Sanjay Saint, MD, MPH (Co-I) is the George Dock Professor of Medicine at UMMS, Director of PSEP, and Chief of Medicine at the VAAHS. He is an expert in implementation science, has over 200 peer-reviewed articles, has won numerous teaching awards, and has scholarly expertise in clinical teaching. He will be involved in content creation.

Jakob McSparron, MD (Co-I) is an Assistant Professor of Medicine at the University of Michigan. He serves as Associate Program Director of the Pulmonary and Critical Care Medicine fellowship and Associate Director of the Critical Care Medicine Unit. His scholarly expertise is in optimizing the role of fellows as teachers in consultative medicine. He has completed the Harvard Medical School Fellowship in Medical Education Research and the Rabkin Fellowship in Medical Education at Beth Israel Deaconess Medical Center. He will be involved in content creation.

Sybil Biermann, MD (Co-I) is a practicing Professor of Orthopaedic Surgery, the Medical Director for the University of Michigan Sarcoma Program and is the Associate Dean of Graduate Medical Education. She will be involved as a key advisor during the feedback process, as she is heavily involved with the MENTOR Series usage for our other target audience – residents.

Anna Berezovsky (Co-I) is a fourth year medical student at the University of Michigan Medical School applying into otolaryngology. She and Lauren (below) have completed a needs assessment for the upcoming Clinical Teaching Elective by surveying their peers and are helping develop the curriculum for the Clinical Teaching Elective.

Lauren Chibucos (Co-I) is a fourth year medical student at the University of Michigan Medical School applying into anesthesiology. Lauren, with Anna (above), will be involved in organizing the group interviews with medical students for our iterative feedback phase as well as curricular development of the Clinical Teaching Elective.

Patricia Mullan, PhD (Co-I) is Professor Emerita in the Department of Learning Health Sciences. Her experience includes developing, teaching, and evaluating courses in health professions education, including medical education electives for UMMS students, the Medical Education Scholars Program, and the Master of Health Professions Education program. Given her expertise, she will be most involved in evaluation of the MENTOR Series.

Mike Englesbe, MD (Co-I) is the Cyrenus G Darling Sr MD and Cyrenus G Darling Jr MD Professor of Surgery, Associate Professor of Surgery and Transplant Surgery, and is the faculty director of the third and fourth year curriculum at the University of Michigan Medical School. Dr. Englesbe has an interest in educational innovations and will be a critical asset in approving and navigating the implementation of the Clinical Teaching Elective.

APPENDIX A – Visual representations of the structure of each “mini-series” within the MENTOR Series

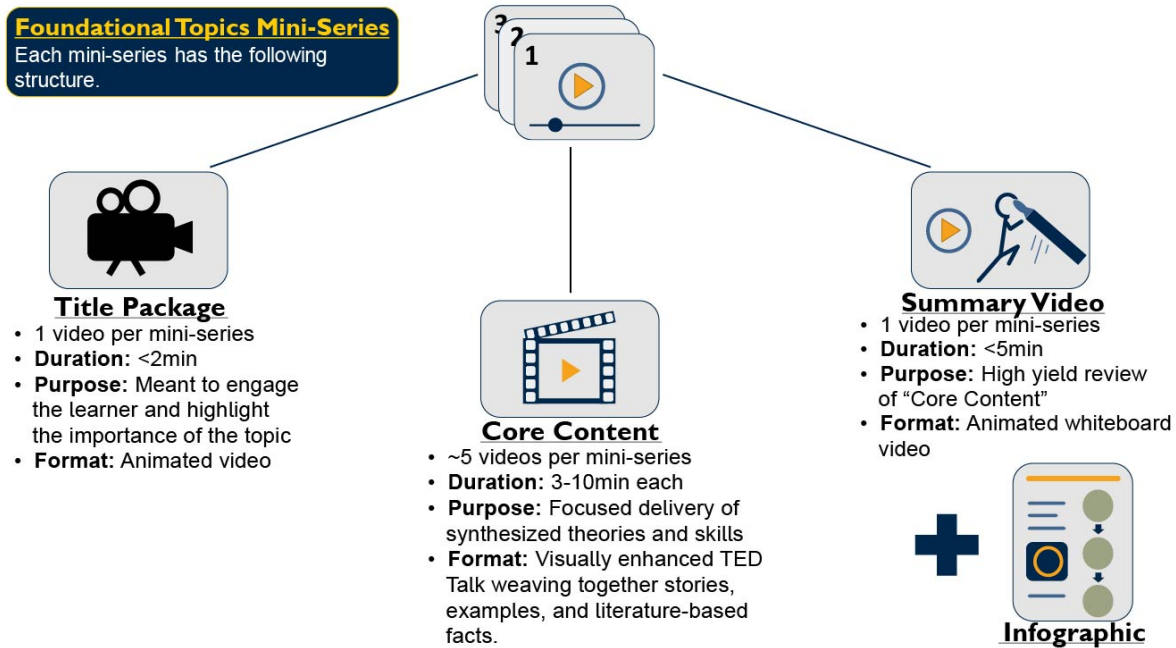


Figure 1. Visual representation and description of the structure of each foundational topic mini-series

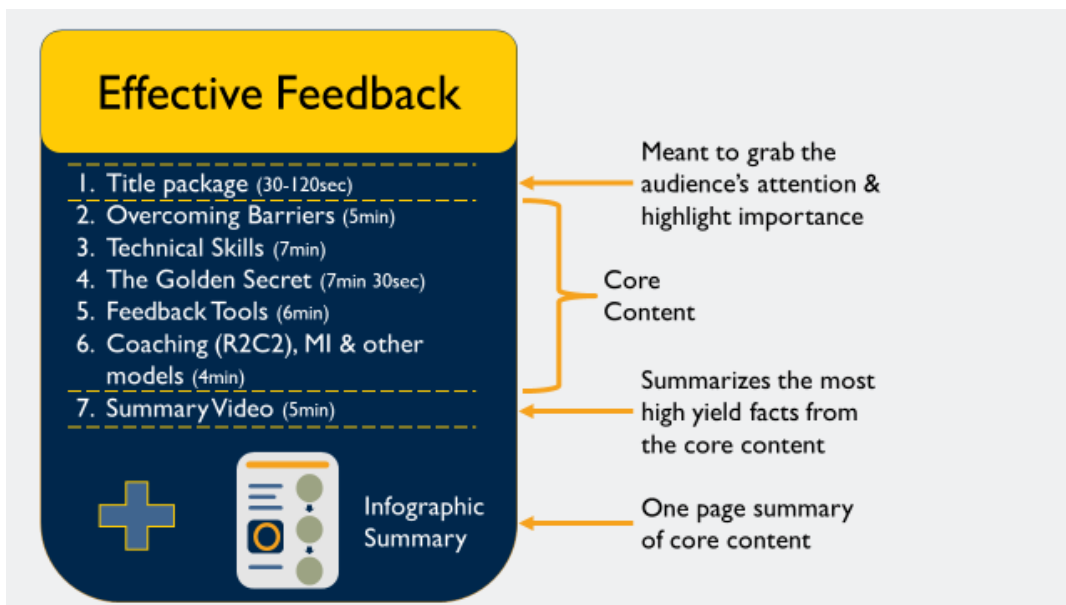


Figure 2. Visual representation of the structure of the "Effective Feedback" mini-series

APPENDIX B – Sample Questions for Group Interview Survey & Sample Questions for Semi-Structured Interview Guide

SAMPLE QUESTIONS FOR GROUP INTERVIEW SURVEY

Demographic Questions

1. What is your year of training (choose from list)
2. What prior teaching experience have you had? (text fill-in)

Questions of Core-Content Videos (Likert 5-point, dichotomous and text fill-in)

1. How would you describe the duration of each individual video (too short, just right, too long)
2. The video(s) were engaging (Likert 5-point)
3. The video(s) were high quality (Likert 5-point)
4. The use of on-screen texts, graphics, and animations were effective for Video A (Likert 5-point)
-If ineffective, please describe how you think the visual delivery could be improved
5. The use of on-screen texts, graphics, and animations were effective for Video B (Likert 5-point)
6. Overall, which video style did you prefer (Dichotomous: Video A or B) and why? (text fill-in)
7. If you could only do one thing to improve these videos for learning, what would it be? (text fill-in)

Questions of Animated Summary Videos

8. Which animation style was more engaging (Dichotomous: Video A or B)
9. Which animation style was better at augmenting your understanding? (Dichotomous: Video A or B)
10. Overall, which animation style did you prefer (Dichotomous: Video A or B) and why? (text fill-in)
11. Please comment on the key strengths of these video(s)? _____
12. How can these video(s) be improved? _____

Infographic Questions (Dichotomous: A or B and text fill-in)

1. Which infographic was more easily understood? (Dichotomous: A or B)
2. Which infographic is more visually appealing (Dichotomous: A or B)
3. How would you rate the quantity of content in the infographic? (Likert 5-point)

SAMPLE SEMI-STRUCTURED INTERVIEW QUESTIONS

1. Is there benefit in having a variety of animation styles in the summary videos, why or why not?
2. What in your perspective are the most engaging components of these videos?
3. How can these videos be improved?

APPENDIX C – “Clinical Teaching Elective” retrospective pre-post survey instrument

Listed below are statements that will ask you to reflect on your skills as an educator. Please note: the first response column (blue) will ask you to assess what your skill level was *prior to participation in the MENTOR Series*; the second response column (yellow) asks you to rate your skill level now *that you have completed one year of participation in the MENTOR Series*. Please circle the response that reflects your perception.

	Prior to using the MENTOR Series, I could...				Now that I have used the MENTOR Series, I can...			
	Strongly Disagree	Disagree	Agree	Strongly Agree	Strongly Disagree	Disagree	Agree	Strongly Agree
	1	2	3	4	1	2	3	4
Create an effective learning environment	1	2	3	4	1	2	3	4
Give effective feedback	1	2	3	4	1	2	3	4
Create effective teaching scripts	1	2	3	4	1	2	3	4
Organize chalk talks around key points utilizing strategies for learning and retention	1	2	3	4	1	2	3	4
Teach efficiently at the patient's bedside	1	2	3	4	1	2	3	4
Ask questions that promote learning	1	2	3	4	1	2	3	4
Find fulfillment in my role as an educator	1	2	3	4	1	2	3	4
Feel confident in my role as an educator	1	2	3	4	1	2	3	4
Demonstrate enthusiasm for teaching and the practice of medicine that motivates and inspires learners	1	2	3	4	1	2	3	4

Adapted from the retrospective pre-post evaluation instrument developed by Patrician Mullan, former MESP Director, UMMS



Michael J. Englesbe, M.D.
Professor of Surgery

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October 15, 2019

CRLT Faculty Development Fund grant
Letter of support for Daniel Cronin

Dear Committee:

I am delighted to support the CRLT Faculty Development Fund grant application of Daniel Cronin. He is an exceptional candidate.

I direct the 3rd and 4th year curriculum. Dan was a stand-out educator as a medical trainee and we recruited him onto the faculty with a focus on clinical care and teaching. Since joining the faculty, he has been committed to developing new curriculum that integrate into the busy life of a clinical student and faculty. The grant is a natural continuation of this work, and will allow for rigorous assessment of his pilot work and career development.

The MENTOR series fills a needed gap in our curriculum. Most of our teaching occurs “ad hoc” during clinical work. These countless, informal educational interactions are unstructured and vary in quality. If we can teach our students to teach *before* they become front-line educators as residents, we can potentially improve the overall teaching quality for these interactions. Dan and the MENTOR team are creating a promising resource to do just that, and we are excited for this great idea. We think our students will benefit greatly.

Dan is a future educational leader. As a young faculty member, he has had a deep impact on our medical school curriculum. As he continues to develop as a key member of our teaching faculty, this grant will provide an excellent opportunity. I enthusiastically support this work and pledge to integrate his MENTOR series into our medical school curriculum to the best of my abilities.

Respectfully,

A handwritten signature in purple ink, appearing to read 'M. Englesbe'.

Michael J. Englesbe, MD
Cyrenus G. Darling Sr. &
Cyrenus G. Darling Jr. Professor of Surgery

Michelle Daniel, MD, MHPE, FACEP
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October 22, 2019

Center for Research on Learning and Teaching (CRLT)
Faculty Development Fund Grant
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RE: MENTOR Series - Letter of Support

I am writing to enthusiastically endorse the MENTOR Series (**M**edical **E**ducators **N**ovel **T**eaching **O**n-demand **R**esource) for the CRLT Faculty Development Fund. Dr. Dan Cronin is one of the most talented junior educators I have had the pleasure of working with. He is passionate about teaching teachers evidence-based educational practices and he “walks the walk”, i.e. he exemplifies the best teaching practices in his own teaching, as evidenced by his outstanding clinical and classroom teaching evaluations! Of note, Dan has been successfully co-directing the Empowering Educators elective for senior medical students for the past 2 years. He was recently hired to co-lead the Scholarship of Learning and Teaching Path of Excellence. These leadership roles will facilitate the proposed implementation and evaluation of the MENTOR Series.

Dan has the requisite knowledge, skills and abilities to successfully complete the proposed project and he has assembled a fantastic team of senior educators to support him in achieving his goals. The team has already received funding to develop the MENTOR Series for resident educators through the University of Michigan GME Innovations Grant. CRLT funding would allow this work to reach another important cadre of future educators – medical students.

Medical students begin to teach as near-peers while in medical school. They then go on to become residents, fellows, and attendings teaching the next generation of students, serving as the pipeline for educators in academic medical centers. I believe it's critical to support curricular efforts focused on teaching medical trainees evidence-based teaching practices *early* in their development. The MENTOR Series project answers this call. Each of the 12 modules will address a foundational education topic, covering both theory and practical applications (e.g., the module on *Presentation Best Practices and Graphic Design* will use Mayer's Multimedia Learning Principles to guide effective slide design). By creating a central repository that can be accessed “on-demand”, the MENTOR Series capitalizes on several principles of adult learning theory: flexible, self-directed learning of content when it meets the immediate needs of the learner (e.g., a senior student can review best practices on *Clinical Preceptorship* just proximal to a specific teaching-learning interaction with junior medical students on their clinical team.)

As the Assistant Dean for Curriculum, I believe we must invest in programs that support the professional development of our students. I look forward to the results of this work and the

subsequent growth of our learners as empowered educators. If you have any questions, please do not hesitate to contact me directly.

Sincerely,

A handwritten signature in black ink, appearing to read "Michelle Daniel". The signature is fluid and cursive, with a large initial "M" and a long, sweeping tail.

Michelle Daniel, MD, MHPE, FACEP