



# A Case Study of Curriculum Co-creation During a Seminar-Style Course for Senior Medical Students

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## Abstract

**Introduction** Opportunities to learn about education theory underpinning medical education are limited in both undergraduate and graduate medical education and predominantly focus on “student as teacher.” Key components of education theory relevant to medical education, including learning theory, curricular design, and assessment design, are rarely included in student-as-teacher training. Opportunities for medical students to co-create curricula with faculty are scarce.

**Methods** We present the case study of a month-long, seminar-style course titled, *Applications and Foundations of Education in Medical Education*. We describe the course, report student feedback, and identify the value of curriculum co-creation expressed in student reflections. The course was designed by a faculty member with formal medical education training; students co-created their own learning outcomes through self-selected articles and personal reflections on the topics: How do people learn; what is the best way to teach; what is a curriculum; and how should students be assessed?

**Results** Forty-seven post-clinical students completed the course; 28 completed course evaluations. They strongly agreed that the class met its stated goals (4.89/5) and that faculty teaching (4.93/5) and supervision (4.93/5) were appropriate. Themes from student reflections expressed that the co-creation process was insightful about the profession itself, from the perspective of their own participation in learning how to become a member of the profession.

**Discussion** This course offered a unique opportunity for medical students to learn medical education beyond the skill of teaching. The course allowed deep immersion into current literature and offered the chance to plan and execute one’s own learning.

**Keywords** Curriculum co-creation · Foundational principles of education · Case study · Seminar pedagogy

## Introduction

Physicians are, by definition, professional students and teachers. A medical career requires ongoing synthesis of a vast and complicated body of information in order to provide optimal patient care. The profession necessitates continued independent learning beyond formal training (i.e., medical school, residency, fellowship) as medical research is continuously updated and health systems constantly evolve. Yet, when it comes to teaching, the profession has been

prone to the longstanding fallacy that an excellent student will instinctively be an excellent teacher. Thus, despite no formal training in teaching, learning, curriculum theory, assessment, or adult learning theory, doctors are expected to be expert learners and efficacious instructors. Familiarity with theories of education or teaching are not explicitly required during undergraduate medical education (UME) by the accrediting body [1].

At some institutions, existing coursework emphasizes “student-as-teacher” or “resident-as-teacher” programs that are geared towards developing the practical skill of delivering instruction [2–7]. Although such courses may introduce the education theory or research underpinning an instructional method, they heavily emphasize implementing and refining the particular skills of lecturing, small group facilitation, or bedside teaching [8, 9]. Some UME programs offer longitudinal medical education tracks which deliver didactics in medical education in conjunction with teaching opportunities and curricular design opportunities [10, 11].

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Although such longitudinal pathways are described as offering core lectures or curricular content on theory, the specifics regarding training in educational theory are rarely disclosed, and these pathways largely emphasize the acquisition of instructional skills [12, 13]. Two such programs reported offering introductions to curricular design; however, the main focus of the intervention was to illustrate converting educational experiences into education scholarship [14, 15]. Formal post-graduate medical education training programs for physicians exist, but they add multiple years to an extensive training path [16]. Focused training on theories associated with medical education during medical school could create more effective teachers and educators [17] while also enhancing students' facility for learning in school as well as throughout their future training and careers.

In this intrinsic case study [18], we present and examine an elective course titled, Applications and Foundations of Education in Medical Education (AFEME) that has been offered to final year students at Emory University School of Medicine (EUSOM). We propose that the seminar style format of the AFEME class, which requires student contributions in order to co-create the course outcomes, embodies curriculum co-creation [19, 20] in multiple aspects. It is worth noting here that when only one student is registered, the syllabus remains the same, but class sessions are tutorial-style. Although tutorials lack peer discussion, the tutees do retain greater influence on the topics discussed and the flow of conversation during sessions. The active, co-creating role that learners take in the course empowers them to understand and engage in adult learning practices and acculturates them to the profession of medicine prior to graduation from medical school. Cook-Sather et al. [20] define curriculum co-creation nicely as, “a collaborative, reciprocal process through which all participants have the opportunity to contribute equally, although not necessarily in the same ways, to curricular or pedagogical conceptualization, decision-making, implementation, investigation, or analysis.”

## Methods

AFEME is an elective course for post-clinical, final year, medical students which offers intensive exposure to educational theory. It is taught in a seminar-style, or tutorial-style when appropriate, as a 1-month long block. We will describe the course itself and student evaluations of the course. At completion of the course, students were asked to fill out a course evaluation to identify course strengths and weaknesses and to describe the educational impact of the course. This evaluation used a standard form for elective courses in the EUSOM program. Students were explicitly asked how well a course met its stated goals, how effective faculty teaching was, and the quality of faculty supervision.

An optional narrative comment could be supplied to clarify strengths and weaknesses of the class or facilitator. These student feedback narratives were examined for this case study. More importantly, the researchers used a grounded theory approach to extract themes from student-composed reflection narratives that were assigned for each topic included in the course. These essays were scrutinized to explore how the course design facilitated students' management of their own learning and their experience of curriculum co-creation. The use of these essays for research was approved by the university's IRB #00001157.

## Results

### Case Description

AFEME was designed and implemented by a faculty member (HAS) with a doctorate in education who is specifically trained in medical education. The month-long course was structured specifically for medical students to engage directly with the literature of education and medical education — beyond just instructional interventions. Course topics included education theories related to learning, teaching, curriculum, and assessment. Students began the course by reading *Calls for Reform of Medical Education by the Carnegie Foundation for the Advancement of Teaching: 1910 and 2010* [21]. This paper introduced the history of professional medical education and considered recent advancements. At the first course meeting, the instructor presented the structure of the course and discussed expectations for student participation in co-designing the remaining content. The next four segments of the course focused on specific topics: How do people learn? What is the best way to teach? What is a curriculum? How should students be assessed? A single required reading introduced each of these topics: learning theory, [22] pedagogy, [23] curriculum design, [23] and assessment theory, [24] respectively.

For each topic, students created an annotated bibliography on the given topic and composed a one-page self-reflection to describe what they had learned and how it had impacted their understanding of their own trajectory into the medical profession. For each annotated bibliography, in addition to the aforementioned assigned article, students independently identified five additional sources (e.g., journal articles, legal briefs, reports) on the topic. For each bibliographic entry, students provided the citation, a one paragraph synopsis, and one paragraph describing the piece's importance and application to medical education. These bibliographies were for students to apply broad educational principles to the context or aspects of medical education which interested them, with an emphasis on delineating how medical education differed from broad

educational philosophy and training in other professions or disciplines. The self-reflection essay was completely subjective and divulged the student's thoughts on the topic broadly, the overarching themes in the papers they had selected, and the impact of their work on their own understanding.

Bibliographies and reflections were submitted 24 h prior to each scheduled seminar. The facilitator distributed the student bibliographies and reflections to all students registered for that month's course to prepare them for discussion at the seminar session. Ultimately, the seminar style induced free-flowing discussion between all students and the facilitator about educational principles, personal experiences, and self-reflections. As needed, the course leader would synthesize or pose questions to the students to introduce and inspire discussion of certain issues or viewpoints.

Creation of the annotated bibliography, self-reflection, attendance, and appropriate effort into class discussions at the tutorial made up 50% of the course grade. The culminating assignment, comprising the other 50% of the grade, was a manuscript-style scoping review on a topic of the student's choice within medical education. This literature-based exploration of a specific medical education topic assessed the size and scope of available research literature and the nature of research evidence, including ongoing research, on the specific topic. Students were guided by a journal article "Scoping Studies: Advancing the Methodology" [25] on how to conduct and report the scoping review.

### Course Evaluation Data

AFEME was first offered in July 2017. Since then, 47 fourth-year students have participated in 28 unique cohorts — 16 had only one student, 5 had two students, and 7 had three students. The majority of course instances were taught by one faculty member (HAS) with another (HCG) taking responsibility for 2 of the cohorts. All students passed the course by successfully completing the 4 annotated bibliographies and self-reflections and submitting their scoping review project. Of the 47 enrollees, 28 course evaluations were completed (59.6%). On a rating scale of 1 to 5 (1, strongly disagree; 5, strongly agree), students strongly agreed the learning objectives were met (mean = 4.89), strongly agreed that quality of faculty supervision was appropriate (mean = 4.93), and strongly agreed that the quality of teaching by faculty was appropriate (mean = 4.93).

The collaborative seminar-style of instruction in the elective differed considerably from the more common lecture-based teaching of theory. Requiring students to independently identify and critically review primary sources and then collaboratively discuss their work was projected to be motivational for future engagement in medical education scholarship. The final, manuscript-style project reinforced the awareness that scholarship is the cornerstone of

educational practice. Most significantly, students built an understanding of the values and social functions of the profession they were about to enter by developing a profound understanding of how that profession is taught [23].

Representative comments in the narrative evaluation included the following quotes:

Very well structured and student centered which helped to create a very straightforward and exciting learning environment. [professor] did an excellent job of creating captivating dialogues and challenging students themselves to think deeper on relevant issues. Issues of race and its interplay in education came up often during the course and rather than shying away from the discussion [professor] opened up dialogue to fully appreciate the gravity of the issue.

I appreciated the overall organization of the elective. It allowed for a great deal of exploration and self-reflection by the student, but I felt like I had the guidance that I needed to develop a deeper understanding of various topics within the realm of medical education. I thought the assignments were reasonable and interesting, and I appreciated that so much time was dedicated to candid discussions about medical education.

I loved this class- it was a super interesting topic, I enjoyed being able to have freeform discussion, and doing our own independent article searches allowed you to customize to papers you were interested in.

### Student Scholarship

Students were invited by the instructor to enhance their scoping review work and submit it for publication or presentation in scholarly venues. As of 2023, seven of the scoping reviews had been elaborated into publishable work: two were accepted as manuscripts for journal publication, and five have been presented at national medical education conferences.

### Student Reflection Data

The seminars, in which students were expected to seek, comprehend, and synthesize their own sources within the literature for class discussion, differed markedly from most medical school courses [7] in that the students became "co-creators" [19, 26] of their own curriculum. Student reflective essays were examined for examples of perceptions that expressed an experience of curriculum co-creation. Characteristics of co-creation, as described in educational literature [20, 27, 28] were used by the authors to recognize the instances when students had participated in co-creation. These co-creation characteristics are shown in Table 1. Although AFEME students were not explicitly introduced

**Table 1** Selected quotes from student composed reflection essays that illustrate key characteristics of curriculum co-creation. Co-creation characteristics were extracted from the following frameworks: Bovill C. Students and staff co-creating curricula: A new trend or an old idea we never got around to implementing? In: Rust C, ed. *Improving Student Learning Through Research and Scholarship: 20 Years of ISL*. Oxford, UK: Oxford Centre for Staff and Learning Development; 2013:96–108. [https://www.research.ed.ac.uk/en/publications/students-and-staff-co-](https://www.research.ed.ac.uk/en/publications/students-and-staff-co-creating-curricula-a-new-trend-or-an-old-idea)

[creating-curricula-a-new-trend-or-an-old-idea](#). Bovill C, Cook-Sather A, Felten P, Millard L, Moore-Cherry N. Addressing potential challenges in co-creating learning and teaching: Overcoming resistance, navigating institutional norms and ensuring inclusivity in student–staff partnerships. *Higher Education*. 2016;71(2):195–208. Cook-Sather A, Bovill C, Felten P. *Engaging students as partners in learning and teaching: A guide for faculty*. San Francisco: Jossey Bass; 2014

Co-creation characteristic	Representative quote from student reflections
Greater RESPONSIBILITY for their own learning	The papers addressing teaching complex tasks and using visualizations to teach anatomy both led me to consider how I have directed my own self-study of both anatomical topics and other non-anatomical ones, and provided me with some ideas of how I could be more efficient in doing so. This is especially true as it relates to how I set up my studying in terms of breaking up topics to study, how and when to implement repetition and quizzing, and how to best visually organize material. I also feel that I am able to better analyze resources that I am considering to use for study, and will be able to make a more informed decision on which are superior with some knowledge of these cognitive theories and qualities that promote and detract from learning. [171802_2]
META-COGNITIVE awareness of their learning process	Learning has always felt like a natural process. Even when learning difficult material, I never stopped to consider how I was learning, or what steps were involved in the learning process. I did not even consider if I was approaching the material effectively for my personal learning style; I just tried to take in, synthesize, understand, and then remember the information I was provided. My readings this week forced me to take a step back and be thoughtful about the process of learning. [192003_1]
Enhanced ENGAGEMENT, MOTIVATION for teaching and learning	The final reading inspired me to practice teaching as much as possible now, as a medical student, through peer teaching and outreach programs. I'm now even more excited about a new teaching project we are starting in which we plan to teach health-related topics to elementary-aged children. [192003_2].
Enhanced student–staff RELATIONSHIPS	However, sometimes, it may be difficult for teachers to reflect without student feedback. In medical education, this has been a tricky area because of the fact that students and teachers work so closely together. As mentioned above, the individual training and the ability to work one-on-one with our teachers makes learning more engaging and accountable. [192001_2]
Curriculum is NOT 'OWNED' by institution	Learners need to feel like their feedback is being heard. In addition, learners should likely have some say in the curriculum, as that is an important activity for self-reflection. What do they wish to learn from the educational experience? How will this serve them in the future? Only by considering and practicing material in an active and realistic environment, can students be well trained for their future endeavors. [202104_3]
CHALLENGE existing views of the world	Foremost among them for me is the idea that we do not in fact want “perfect” education. [Skinner] states that if everything written down on a syllabus is learned perfectly with no variation by every student, then that is tantamount to brainwashing. This point resonated with me... that variance in absorption of information and subsequent opinions on a subject (while troublesome for testing) may in fact be healthy for a field (and society) even when there are universal standards to be adhered to. [192002_2]

to language of co-creation and it was not described in the syllabus, many of their reflective essays revealed that they had, nonetheless, experienced the phenomenon during the course when provided the right conditions.

Exemplars of student writing for each characteristic of co-creation are listed in Table 1. Of the 88 essays examined, 31% of the essays referred to the co-creation characteristic of “responsibility for own learning,” 26% mentioned “meta-cognitive awareness, 16% expressed enhanced engagement and motivation,” and 34% proposed to “challenge existing

views.” Less frequently mentioned characteristics were 7% who reflected on “student–staff relationships” and 3% who alluded to “ownership of the curriculum.”

## Discussion

Learning about and then employing the educational theories that underpin teaching and learning empowered students to regulate with their own learning, to consider

how they should design their own educational process in their careers, and to appraise the roles of existing social and educational institutions. Although there are multiple courses teaching students how to teach [2–8, 10–13], student have very limited opportunities to learn about the broader education principles and theories underling the structures of medical education. From our case study, we believe that the AFEME course provided a template for critically introducing knowledge of education theory and for engaging students in co-creating curriculum. This course format is likely applicable at other medical schools or during residency/fellowship programs to allow learners to develop their understanding of their own learning and to prepare for medical education as a possible career. The AFEME course is complimentary to “student-as-teacher” courses designed to develop instructional skills, which is itself a discrete skill set. Our curriculum co-creation approach [28] to medical education provided students with a profound understanding into personal learning, curriculum development, and assessment deployment during ongoing training. It also provided a steppingstone to pursue continued learning of education theory and scholarly work that will improve and enrich the systems of medical training.

AFEME course instructors at EUSOM hold an advanced degree in education (HAS) or have had considerable experience in the discipline related to curriculum, teaching, and assessment (HCG). Although the course was designed by an expert who holds a Ph.D. in curriculum and assessment, the essence of the course lay in the partnership with students to co-create the curriculum. Students selected their own articles to read and summarize for their annotated bibliographies and to analyze in the scoping review, so the faculty leader’s role was to react, ask probing questions, and engage in discussion from the perspective of an instructor and former student. Based on the course syllabus, which presents the outline of assigned topics and limited required readings, an experienced and well-versed medical educator can effectively co-create the course as a facilitator and co-learner with the students. Some knowledge and experience with educational theory was necessary to lead the course, as was a willingness to allow students latitude in their learning. Expertise in medical education theory, although beneficial, was not a pre-requisite for instructors.

In addition to the formal curriculum of the course, since 2020 many of the discussions and selected articles have delved into the concepts of “hidden curriculum” and “implicit bias.” The structure of the course lends itself to exploring all issues that are pertinent to medical students — rather than just those determined by the faculty. One student stated that the seminars were, “The first time that I felt ‘heard’ in medical school.” This is a unique space in

medical education for investigation and candid discussion of the sociological factors the permeate medical education, the medical profession, and healthcare in general. Students and faculty have both benefited from the opportunity to discern meaning in their work and reinforce the value of their daily tasks. The ultimate year of medical school is pivotal in a medical student’s career trajectory, which has accentuated the value of the course emphasis on situating medical education within the larger contexts of the medical profession, healthcare systems, and society.

Implementing this course at other institutions may be limited by the faculty member’s experience and comfort in discussing open-ended principles of education. Additionally, our institution has an extended period following required core clerkships which allows students flexibility to take non-required courses. Incorporating an AFEME-type course could be difficult in curricula that include less elective flexibility. A crucial caveat is that the value of AFEME is contingent on student participation, as almost all of the content in the class is generated by the student’s review of the literature, development of written components, participation in class-discussion, and topic of the final scoping review. As expected, there have been variable levels of student engagement with the material; however, students reap the benefits in proportion to their own effort and engagement. All students successfully completed the coursework and demonstrated achievement of the objectives, yet a few extended beyond the course to produce published manuscripts, posters, and conference presentations based on their work.

Despite these stipulations, this course could be successfully implemented at most schools during their post-clinical phase. Student interest in the course at our school has remained consistent, which may be incentivized by the educational credit offered or the flexible schedule during the month in which they are enrolled. Although it may be possible to implement this course at different point of the medical school curriculum, prior to the intensive clinical exposure during required clerkships students’ understanding of the practice and culture of medicine is limited. AFEME offers a model, not a template, for other medical schools to develop a course suited to their own context.

## Conclusion

We believe the AFEME course described here offers a unique design that presents core tenets of medical education theory and requires students to independently grapple with the primary literature in order to co-create the course content and outcomes. Requiring this level of student commitment differs from traditional lecture-based teaching and improves student engagement. Taking ownership of course content, as described by students themselves, increased awareness of



personal learning and kickstarted an interest in medical education scholarship and careers. Experiences of co-creation align well with effective adult learning and role modeling this approach to learners who are simultaneously learning about education principles cements its efficacy.

## Declarations

**Conflict of Interest** The authors declare no competing interests.

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