The B-TEAM: Curriculum Development through Mutual Mentoring

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Abstract

This paper outlines an approach to department-level curriculum development and restructuring grounded in a mutual mentoring process. The paper discusses the mutual mentoring model, describes the unique institutional characteristics, presents the research methodology for peer-assessment, and concludes with a discussion of the findings and suggestions for curricular restructuring. The paper closes with reflections on the impact of the novel mutual mentoring model for this type of curricular development

Introduction

Curricula in accredited architecture degree programs follow an ever-evolving cycle of change and revision, responding to environmental and social shifts, increasing technological demands, changing professional roles, and accreditation criteria. This is particularly true of building technology curricula where there is rapid change in building technology itself and expectations for technical proficiency in recent graduates, but also a growing shift in the understanding of the role of building technology within a broader architectural education. In this context, building technology is not merely a “technical” subject, but one that must acknowledge and reckon with the energy, resources, and labor required for buildings and the values and cultural conditions inscribed in the way buildings are designed, detailed, and constructed.

To engage these questions, the authors initiated an alternative approach to standard institutional curricular reform processes. Rather than a curriculum committee tasked with studying and proposing changes for faculty to consider, the Building Technology Educators Advancing Mentoring initiative – the so-called B-TEAM – proactively proposed a *mutual mentoring* model to investigate approaches to teaching building technology in advance of necessary departmental restructuring. The team leveraged a mutual mentoring grant to build networks focused on technology pedagogy within and outside of our university while also engaging several questions specific to our institutional context: 1) how to transition our building technology courses from a legacy of cross-department collaborations; 2) how to deliver building technology course sequences with a small design-focused faculty; 3) how to offer technology coursework required for accreditation and add new innovative courses while managing fluctuating M.Arch cohort sizes.

This paper shares the team’s research methods and findings as well as reflections on the mutual mentoring process. By investigating these questions through the novel method of a mentoring grant rather than a service-level curriculum committee, the process aimed for more collective benefit, addressing departmental curricular reform while also supporting the team in establishing and expanding a mentoring network of design and building technology faculty at peer institutions for ongoing dialogue about curricula and careers more broadly.

Background: Institutional Context

The University of Massachusetts Amherst is an R1 university and the flagship campus for the Massachusetts state system. Our department is located within the College of Humanities and Fine Arts, which houses twelve departments ranging from Art to English to Theater. Having first achieved NAAB accreditation for a Master of Architecture in 2007, our Department of Architecture is young and remains a relatively small program despite significant expansion over the past two decades. As the first professional M.Arch program at a public institution in our region, providing an accessible education that prepares students for professional practice in architecture has always been core to our departmental mission.

We offer two pre-professional B.S. degrees, 2- and 3-year M.Arch programs, and multiple MDes programs. We have approximately 150 undergraduate students and approximately 50 graduate students enrolled in 2- or 3-year M.Arch and/or MDes programs. Historically, our case for accreditation was built on strategic relationships with allied departments and programs including, most critically, the Art Department and the Building and Construction Technology program. First year students in the architecture department typically take foundation level art and design studios in the Art Department before transitioning into dedicated architecture studios during their second year. Similarly, for many years, Building and Construction Technology faculty taught the required building technology courses for both the undergraduate pre-professional and graduate professional programs, including courses in materials and methods, structures, and environmental systems.

These strategic partnerships and the ability to leverage expertise in allied departments has been critical for the successful establishment and growth of the Department of Architecture. However, due to unprecedented growth in the last several years, the Building Construction Technology program has outgrown their ability to enroll our students. The need to take over multiple courses almost simultaneously is challenging for the architecture department, but it also presents a unique opportunity to reconsider how we teach building technology in the context of dialogues occurring more broadly in the profession. Building technology courses are often criticized for being insufficiently integrated with core design work, and many programs have been exploring models for productively integrating or linking these courses for mutual benefit.[1] Moreover, the discipline is facing unprecedented rates of technological change as we strive to decarbonize the built environment, and through the rapid evolution of the tools of architectural production such as BIM, building performance modelling, and the introduction of artificial intelligence.[2] Increasingly, students must attain expertise in these areas as a baseline for entering professional practice. With a preponderance of students who are working their way through school while balancing multiple obligations, we feel pressed to achieve a curriculum that can innovatively and efficiently deliver a strong building technology pedagogy.

Mutual Mentoring Model

Successful mentoring is well established as an important component of professional success across career phases.[3] In the academy, mentoring provides an effective method for improving understanding of organizational culture and values, boosting productivity, supporting effective teaching, providing social and emotional support, and increasing workplace satisfaction; it is cited as being particularly important for early-career and underrepresented faculty.[4] While traditional mentoring relationships were conceived as top-down, one-on-one relationships, newer, more flexible and mutually beneficial networked models have emerged to support a more diverse faculty with increasing and varied needs.[5]

At UMass Amherst, the Office of Faculty Development provides infrastructure to facilitate Mutual Mentoring projects designed around a theme or challenge. The mutual mentoring model distinguishes itself from traditional mentoring relationships by providing resources to cultivate non-hierarchical networks of mentors who share knowledge and experiences in targeted areas of academic life such as understanding academic culture, understanding tenure and evaluation, creating work-life balance, excelling at teaching and research, and developing professional networks.

The B-Team's Mutual Mentoring Grant Application identified project objectives centered on the target area "Excelling at Teaching".[6] These described both individual and departmental priorities such as supporting new faculty in developing their teaching talents and skills, outlining possible curriculum restructuring to better support the teaching of building technology, and identifying and charting new areas for faculty hiring. However, these teaching-related objectives were nested in a series of broader goals centered on developing both internal and external professional networks including

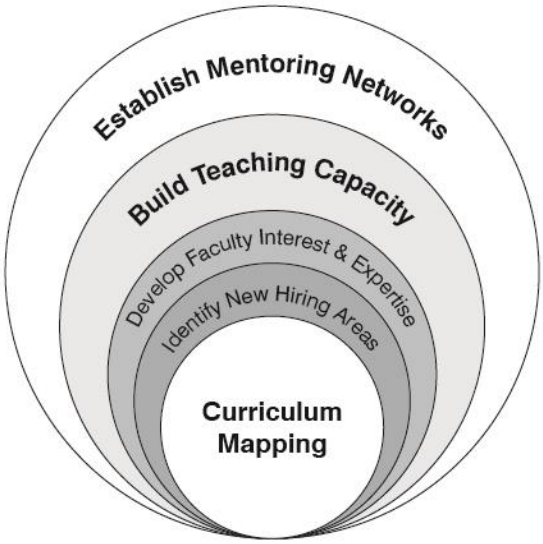

Figure 1. Mutual Mentoring Project Goals

establishing a mentoring network of design and building technology faculty at peer institutions for ongoing dialogue and identifying mentors who could support the development of individual faculty expertise and opportunities.

Methodology

The mutual mentoring model facilitated a constellation of activities to support the project goals outlined above. This stands in contrast to a more normative curriculum committee which may be narrowly focused on responding to short- or near-term needs within immediate faculty and budgetary constraints. As illustrated in Figure 2, our team engaged in a variety of activities over the course of two years, including internal team meetings, presentations to our faculty, a literature review, peer assessment of a series of peer and near-peer institutions, structured interviews with faculty at other programs, unstructured conversations with faculty at other programs, and on-campus visits.

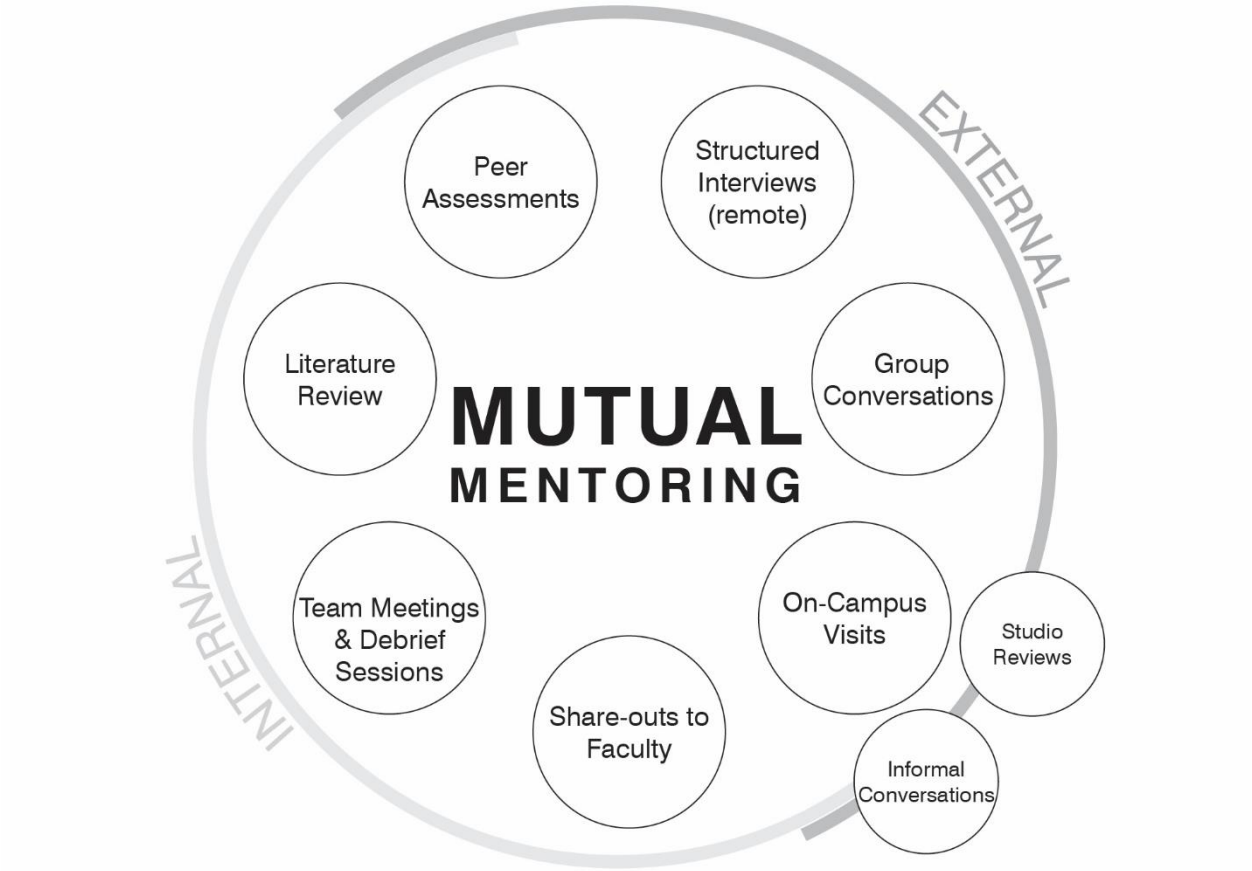

Figure 2. Scope of activities supported by mutual mentoring project.

Curricular Review Process and Findings

We began by conducting a series of peer assessments of peer and near-peer programs and departments. We identified eight programs across the country that exhibited key overlaps with one or more characteristics of our program. This included programs of similar size at R1 universities and programs with similar degree paths and student populations. We also included a few near-peer programs with particularly interesting approaches to building technology pedagogy and/or that had recently undertaken curricular restructuring.

We then reviewed and assessed the eight programs across a series of categories, including program size, degree programs, faculty size and composition, undergraduate level building technology course requirements and sequence, and graduate level building technology courses requirements and sequencing. For each program we mapped their curriculum chart in a consistent format so that we could assess similarities and differences between these programs and our own curriculum (see Figure 3). While we assessed the undergraduate curriculum at each program, we focused primarily on the professional M.Arch programs and on required coursework necessary for NAAB accreditation. We paid particular attention to the sequencing of building technology and the relationship between technical courses and studio design courses, to the extent possible from publicly accessible curriculum charts and information.

Following this assessment, we identified four programs for further investigation and conducted in-depth interviews with faculty members who teach in various

parts of their program's building technology sequence. The four programs we interviewed were all located in public [R1] institutions: one program was a similar size, one was much larger, one is more heavily resourced, and one has a smaller full-time faculty with instructors drawn from local professionals.

Interviews were conducted via Zoom and lasted approximately 90 minutes. In advance of interviews, participants were asked to share documentation such as curriculum maps, faculty publications related to teaching building technology, and any other program documents, such as syllabi, that would facilitate the conversation. An outline of questions was shared with participants in advance. This template provided a structure for data collection but allowed for unstructured conversation to evolve in response to participants' responses. Key questions included prompts concerning the overall program vision and how the thinking concerning the building technology sequence interacts and reinforces larger program goals. Questions were also asked about recent curriculum redesigns as well as the precipitating drivers and resultant outcomes. Practical questions addressed the level of integration among courses and with studio sequence, differences between the undergraduate and the graduate programs, and associated overlaps and efficiencies in coursework. Finally, we asked participants to reflect on the strengths and weaknesses of their building technology curriculum, the most innovative things they believe they are doing, what they wish they could do, the barriers they encounter, and what it would take to achieve these goals. Conversation transcripts and meeting notes provided material for analysis that followed.

Outcomes: Curriculum Design

Not surprisingly, the structure and delivery of technical content varies considerably across architectural programs, reflecting different pedagogical and programmatic priorities. Three key themes emerged from our peer assessments and interviews. First, programs exhibit diverse approaches regarding the timing of core technical preparation. Some require extensive undergraduate preparation; others concentrate technical material into the first year of their two-year programs; and others bookend technical materials or position it in the final year of graduate education.

Second, the degree of integrated technical coursework varies across programs but also within programs, and many programs employ standalone and integrated coursework at different points in their curriculum. Standalone courses offer certain advantages, including efficient faculty allocation, combined undergraduate and graduate courses, and general flexibility. In contrast, integrating technical coursework with studio design provides greater opportunity for application of knowledge in design contexts and improved student outcomes, but requires intensive faculty engagement and coordination.

Third, the structure of academic terms, particularly the balance between more fixed versus more flexible semesters, varies in response to specific program identities and strategic priorities. Often programs configure their course sequences to accommodate various educational objectives and student needs. For instance, some departments book-end required coursework to allow design-build or study-abroad experiences mid-program. Others frontload technical coursework to allow thesis, research, or topical studios.

Identifying these key themes has shaped our process for revising our curriculum in a series of important ways. For instance, we are looking for opportunities to share building technology coursework between the undergraduate and graduate programs. This will allow us to increase the technical foundation for undergraduate students to be comparable with peer institutions,

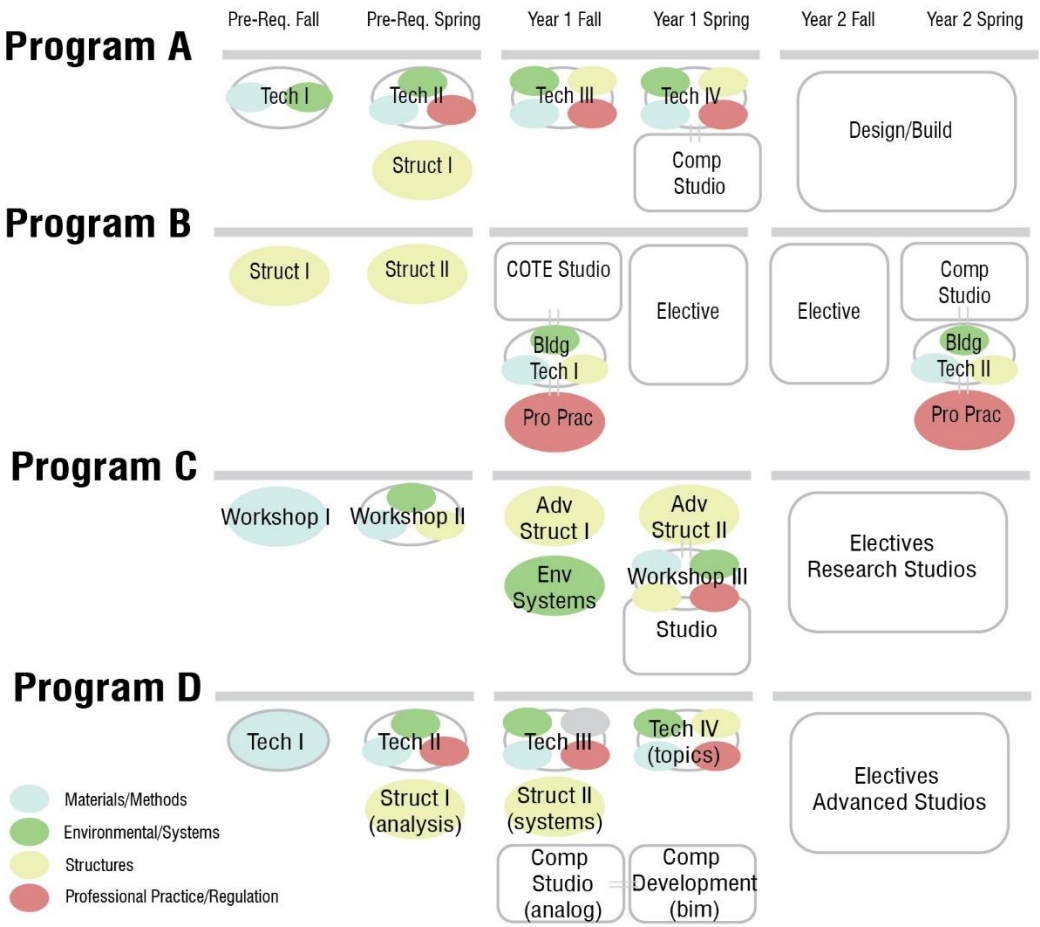

Figure 3. Analysis of programs & course sequences.

strengthen the 4+2 program in our department, and better manage fluctuating graduate enrollment. Similarly, we are looking for strategic opportunities to maintain standalone building technology courses while also identifying opportunities to integrate select building technology courses with graduate level studios. This is motivated by an assessment framework that maps course content to NAAB criteria through an iterative process: key technology concepts are *introduced* in standalone courses during undergraduate and prerequisite years, *applied* through integrated coursework during the middle of the program, and *reinforced* though partially integrated courses in the final semesters. Rather than a fixed set of suggested curricular reforms, the research supported by the mutual mentoring model facilitated the development of a flexible framework that can be adapted to changing departmental needs and constraints

Outcomes: Mentoring Networks

While the specific curricular analysis and recommendations are one of the important outcomes from this process, innovative use of the mutual mentoring model facilitated a host of activities over two years that supported our expanded goals beyond just making recommendations for curricular redesign. In addition to the peer-assessments and structured interviews, we held multiple internal “debrief” sessions, shared findings with our faculty, hosted three unstructured conversations via

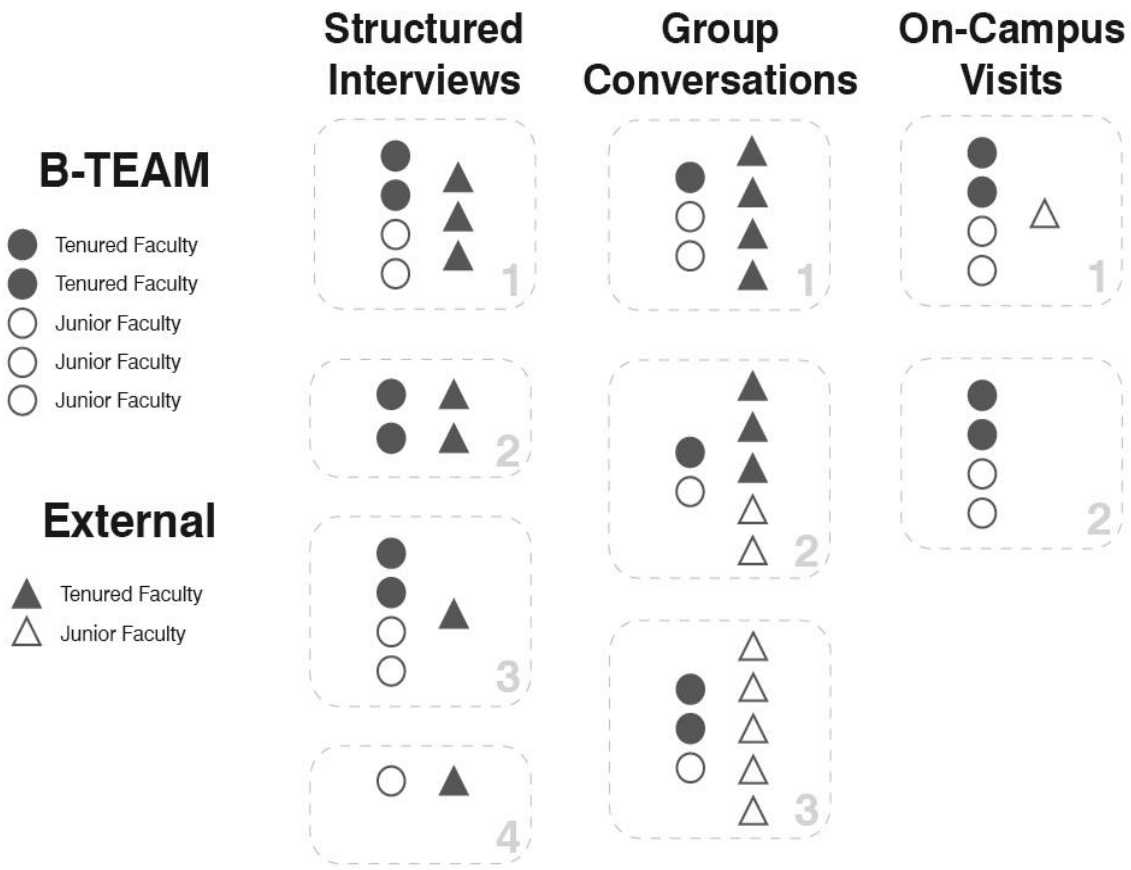

Figure 4. Activities and participants.

group dinners at national conferences, two on-campus visits from outside faculty members, and the preparation of a paper for presentation at a national conference (Figure 4). As noted, a key feature of the mentoring model is encouraging non-hierarchical mentoring relationships between faculty members at different stages in their careers. As Figure 4 illustrates, our team members were able to build relationships with a wide range of faculty members outside of our institution and at different points in their careers.

It's also worth noting the extent of the individual networks developed during the course of this project. For instance, our team members each had the opportunity to build relationships with over a dozen faculty and potential mentors outside of our institution (Figure 5). As an institution, we engaged with approximately sixteen other programs geographically distributed across the country.

Discussion

There are two broad observations that emerged from this project that we think are unique outcomes of the mutual mentoring process and the set of activities that we pursued.

First is that the extensive formal and informal conversations encouraged a greater degree of self-reflection on our program. Through these conversations we gained more detailed insight into other programs' evolution, challenges, and particular approaches to pedagogical design than would have been impossible to glean from document review alone. In particular, we noticed that many schools have specific institutional

priorities or a departmental ethos that compels them to structure their curriculum in a particular way. For example, one program prioritized students participating in faculty-led research, and the M.Arch curriculum was structured to accommodate this, while others prioritized a semester focused on a design-build project or a semester at a remote campus. Noticing the importance of these varied institutional ethos' allowed us to turn the question back on ourselves to reflect on our priorities and values as a department, and to be intentional about how this is reflected in our curriculum in the future. This realization was only possible through the interactive, qualitative activities/methods. The collective dialogue fostered self-reflection concerning our own maturing departmental vision.

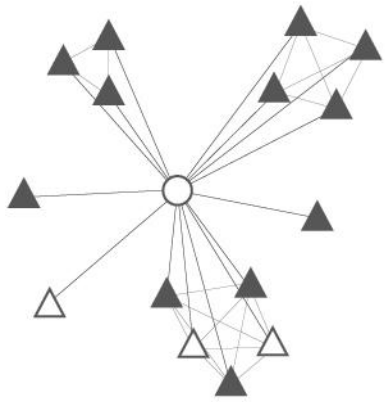

Figure 5. Mutual Mentoring Network Diagram

Second, the mutual mentoring model enabled us to build departmental, individual, and what we came to call "collective" capacity. At a departmental level, we have outlined a set of near-term and long-term priorities and curricular goals while identifying key areas for future hiring. At an individual level, we have extended our personal networks, developed a mentoring network and on-going dialogue to support our own teaching, and, critically, countered the tendency towards faculty burnout through a process that offers individual benefit and growth. The mutual mentoring model enables the sharing of knowledge in a non-hierarchical fashion such that knowledge became "more distributed than concentrated"[7]. Finally, we built a collective capacity that exists between the individual and the departmental levels. By working as a team that represented a significant contingent of the department's faculty, including both junior and senior members, this work was inherently collective. We each brought our unique perspectives to the conversations and evaluations of each program. The collective nature of this process facilitated the process of identifying key overlaps and synergies in these perspectives, moving us towards a more collective vision. Furthermore, this collectivity has been instrumental in coalescing the group as a core set of stakeholders as shepherds of the ongoing and anticipated curriculum development and hiring processes, which often take extended periods of time.

Implementing a mutual mentoring model for curricular redesign as outlined in this paper offers several advantages over conventional service-based curriculum committees. This project positioned us to create a set of short-term and long-term curricular goals within a flexible framework for curricular remapping while identifying key areas for future faculty appointments. Crucially, the mutual mentoring model allowed the narrow focus on curricular restructuring to be expanded to include a host of mutually supporting goals that benefit the department while supporting individual faculty growth. This is particularly valuable for early-career and pre-tenure faculty because it facilitated the growth of a broad, diverse network of potential mentors to support excellence in teaching and professional growth.

Notes:

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7 J.H. Yun, B. Baldi, & M.D. Sorcinelli, “Mutual Mentoring”.