Identifying Faculty Development Needs of Basic Science and Clinical Faculty in Preparation for Curriculum Change

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ABSTRACT

Introduction: Curriculum design is an iterative process that medical schools undertake to assess, adapt, and improve existing curricula. Need assessments are a foundational component in this process because they help identify concerns requiring attention. However, needs assessments historically have focused on students, with minimal emphasis on faculty needs. During our institution's curricular design process, faculty participated in listening sessions that identified their concerns.

Methods: Participants were recruited to participate in semistructured interviews via Zoom. Inductive and deductive processes were used to identify key thematic codes based on interview responses. Codes were then stratified to identify representative quotations within each theme.

Results: Twenty-four faculty members participated – 8 basic science faculty and 16 clinical faculty. Most expressed excitement about the potential of the new curriculum but also shared concerns about implementation. Time was the most significant concern, with faculty citing current workloads as a primary challenge. Uncertainty regarding roles and the implementation timeline was another concern. Other frequently discussed themes included clinical reasoning, critical thinking skills, facilitator availability, and experience with new teaching techniques.

Conclusions: Semistructured interviews were effective for identifying faculty concerns that can inform future faculty development programs. Not surprisingly, concerns about time – particularly time for required faculty development – and uncertainty about roles were most prominent. These findings enabled the curricular leadership team to prioritize the development of efficient and targeted faculty development programs.

INTRODUCTION

Curriculum design is an iterative process that medical schools routinely undertake to assess, adapt, and improve existing curricula.[1] The traditional medical school model consists of two preclinical years of didactic courses and two clinical years of clerkships. Many medical schools have transitioned to a model that reduces time spent in didactic preclinical courses and instead emphasizes integrated content to maximize clinical learning.[2] Frequent adjustments and reorganization of courses or entire curricular blocks are common in order to keep pace with innovations in health care, teaching techniques, and technology.[3] Further, medical schools across the United States (US) generally share similar overarching goals for their new curricula when undergoing curricular change.[4,5] For instance, many have increased efforts to shift from primarily passive didactic sessions to offering more opportunities for self-directed learning.[6] Institutions have also implemented new models for how coursework is structured. Finally, some have suggested that additional integration could allow for reducing the total time spent in medical training, with a vision for combined undergraduate and graduate level medical education.[7]

Our medical school embarked on the challenging task of developing a new curriculum that better integrated content and maximized clinical experiences. In designing the curriculum, efforts were made to create a "clinically applicable, fully integrated basic science teaching"[3] using "active, small-group, and inquiry-based learning methods; patient care and health care team experiences; and individualized, differentiated training."[3]

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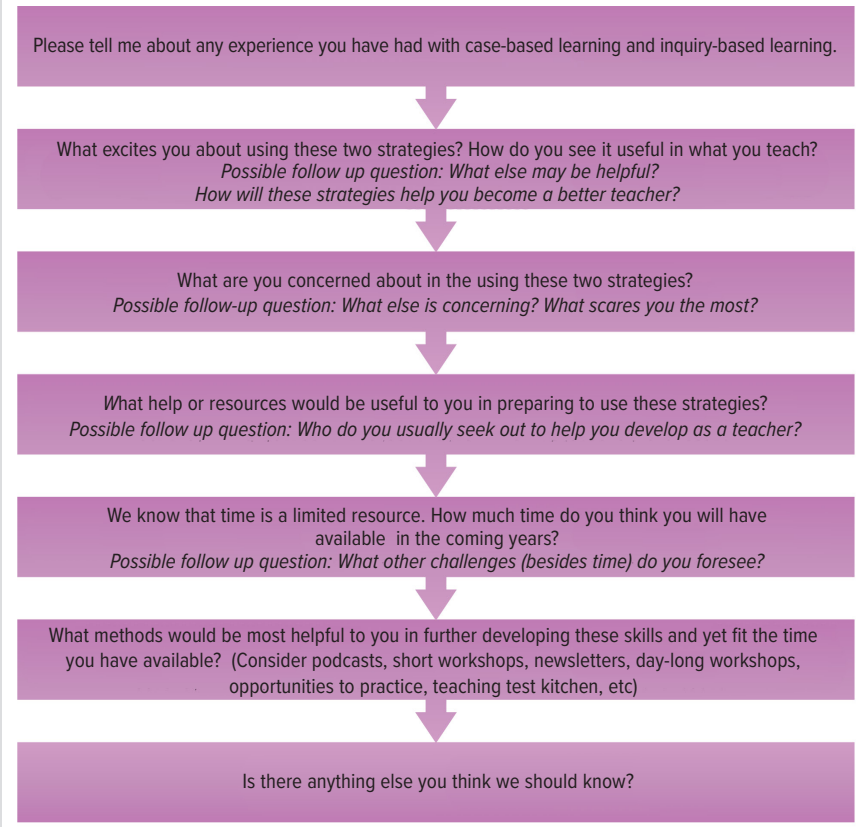
Stated goals included:

- To produce competent, well-rounded physicians who will be excellent clinicians in any specialty.
- To prepare graduates "to practice in the rapidly evolving future health care environment and to become lifelong learners."[3]
- To provide students with opportunities to develop skills for specific career goals.[3]

These goals highlight the curriculum development team's commitment to creating a student-centered curriculum that integrates concepts across all experiences.

Given the significant changes to content formatting as well as the need for faculty to employ active learning strategies, understanding faculty concerns and training needs is vital. Needs assessments are a foundational component of curriculum innovation because they help identify concerns that must be addressed. However, needs assessments have historically focused largely on students and their learning needs[8] with minimal emphasis on faculty needs. Faculty are often resistant to dramatic curricular changes,[9] particularly early in the process, due to a desire for stability and a belief in the current system.[10] Resistance to curricular change can be linked to faculty members' identities as educators.[11] This resistance can arise when expert teachers feel they are returning to a novice state in response to institutionally imposed changes.[11] Thus, including faculty throughout the design process is critical for overcoming such resistance.

Figure. Semistructured Interview Questions



In this vein, the Medical College of Wisconsin's new curriculum raised concerns among faculty. Curriculum developers partnered with human-centered design (HCD) experts in an educational research institute within the university to assist with identifying faculty concerns through a targeted needs assessment.[1] HCD facilitates educational innovation through design thinking, with a focus on empathy and curiosity.[12,13] It also takes a people-centered approach by engaging stakeholders and fostering creativity.[14] Applying this approach was critical in identifying faculty concerns and highlighting opportunities for improvement during curricular design. Because the success of the new curriculum relied heavily on faculty involvement and support, it was important that curricular designers created a product that faculty would be enthusiastic about delivering to students.

With these principles in mind, the HCD experts conducted a series of listening sessions to explore faculty perceptions of and concerns about the proposed curriculum. The listening sessions revealed that faculty were concerned about their ability to provide the necessary content within the new curricular format, how they would manage new expectations alongside existing responsibilities, and what types of preparation the new format would require. However, specific details of these concerns remained unclear. Therefore, this project was proposed to collect additional information to better inform the curriculum development team regarding faculty needs across educational settings and to gather information about potential strategies to mitigate concerns such as time constraints.

Furthermore, understanding faculty needs and constraints was necessary for the curriculum development team, instructional designers, and other faculty developers within our system to create faculty development offerings. Completing this needs assessment would help these groups craft efficient and effective interventions aligned with the institutional context and content. Prior experience at our institution and others has demonstrated that failing to identify such issues can challenge implementation of a new curriculum and may adversely influence both faculty well-being and student learning.[15,16]

This study aimed to gather in-depth needs assessment data through qualitative interviews with basic science and clinical fac-

Table 1A. Themes, Definitions, Frequencies, and Sample Quotations

Subtheme	Definition	No. Who Discussed Theme	Frequency of Code	Participant Quote
Theme: Preparation for the new curriculum				
Faculty development	Modalities (podcast, video with commentary, hands-on with expert support, coaching, guiding framework), timeline of faculty development, material preparation	23	146	"I think it might sort of depend on the topic a bit. Some of it might do well with asynchronous. So, something like how do you edit videos. That could easily be a video that I watch on my own time to learn how to edit the videos. An overview of all the technology we have available to us as [our institution's] faculty or employees. I could watch a video of that on my own. Things like small group facilitation, growth mindset I feel should be in person, or not in person but synchronous (in person or virtual). So, when I was thinking about how much time I would be able to have to take these courses I was thinking of them as being…1- to 2-hour workshops that are in person or virtual. So, my answer would be the same for that. As far as asynchronous, I think if I had a half-hour video to watch every week that would be very easy to fit into my schedule. But I guess it varies from person to person."
Time	Lack of time, protection of time, payment for time, prioritization of time (educational vs clinical vs research), volunteer time issues, time for faculty development	22	119	"I think one of the challenges with getting people ready will be that the old curriculum will still be ongoing. So, a lot of us have things that we have commitments with the old curriculum — we can't just not do them. So, that's one of their competing concerns."
Understanding	Participant's understanding or knowledge about case-based learning and inquiry-based education	15	24	"Since I teach in a medical college, I think it will be incredibly useful because we are going to be focusing on cases, and training future clinicians to receive information in the way that they will receive it… – in a stepwise manner, not getting all of the facts at once – I think is important. And I also think it can correlate really well – as they are learning clinical reasoning skills, it can really be incorporated into the case. So that is why I am a big fan of case-based learning, especially in medical education."
Theme: Feelings about implementing a new curriculum				
Uncertainty	Role, timing, what is needed for success, timeline for product development, resources while providing 2 curriculums simultaneously	19	86	"On the flip side of that, we are wondering if we will be overwhelmed in our work, that there won't be enough manpower to go around because we'll be asked to teach throughout all 3 phases of the curriculum and will be expected to be in two places at once."
Experience	Participant discusses or describes their experience with case-based learning and inquiry-based education	20	68	"You know, in my teaching experience I wouldn't say that I have formally used either of those. I think more that principles within those probably have been part of the various teaching that I've done."
Partnerships	Build on strengths, fill in gaps, excitement working with others	15	60	"I think we have to partner with our basic scientists and our clinicians to ensure that we're all speaking, number 1, the same language, we all have a shared understanding of the vision that we want for each of our curriculum [sic]. But, again, I can't emphasize the language piece enough because the minute we miscommunicate, that's when I think the students are going to get turned off, faculty might get frustrated, coaching might go astray, feedback may be misdirected."

ulty to identify opportunities for improvement in the curriculum's design and to support the creation of efficient and effective faculty development interventions. The research questions guiding this study were: "What aspects of the new curriculum are faculty most excited and most apprehensive about implementing?" and "What types of support and faculty development offerings are necessary to prepare faculty to be successful in delivering the new curriculum?"

METHODS

The Medical College of Wisconsin, the site of this study, is a private health professions graduate-level university located in a midwestern US city, with two regional satellite campuses located in other areas of the state. It is one of two medical schools in the state. Semistructured interviews were conducted with basic science and clinical faculty members from November 2021 through April 2022. Any basic science or clinical faculty member actively involved in the medical student curriculum was eligible to participate (approximately 39 faculty members). Basic science and clinical faculty who had minimal (<4 hours per academic year) or no contact with medical students were not eligible. The MCW Institutional Review Board determined the project was not human subjects research in January 2022.

Potential participants were contacted via email by a study team member; those who elected to participate were scheduled for a 30- to 60-minute interview. Interviews were conducted and recorded on the Zoom platform; Zoom-generated transcripts were downloaded, cleaned, deidentified, and labeled basic science or clinical faculty. The list of semistructured interview questions is provided in the Figure. Questions focused on the participants'

Table 1B. Themes, Definitions, Frequencies, and Sample Quotations

Subtheme	Definition	No. That Discused Theme	Code Frequency	Participant Quote
Theme: Inputs for curricular development and design				
Facilitators	Number, role, preparation, volunteer issues, departmental or leadership support	16	57	"The concept of instead of a lecture…where you have 1 instructor teaching 200 students, you're going to have 1 facilitator, with a group of 10 to 12 to 14 students means that you need to have 20 times the number of facilitators…I know that's part of the plan, but I don't think anybody has explained to us how we're going to magically get 20 times the number of instructors for our students."
Development of materials	Synchronous vs asynchronous, active with expert guidance, timing, depth of materials	18	53	"Practical tools that will help faculty do these skills, so, for instance, if there's a template to follow, make that available. if there's a toolbox of, you know, how do you structure a case appropriately, make that available. Those are by far very practical approaches and that doesn't require a whole lot of time. Talking at faculty about concepts that they may or may not implement in the given course that they teach is probably going to be less helpful."
Skills	Mentions abilities to create or design cases, lead case discussions, facilitate implementation of case-based learning or inquiry-based education	14	31	"I routinely use cases in my teaching already. Most of my colleagues do as well, whether it is a formal case or sprinkled in throughout large reflectors does not matter, case-based is something I have long incorporated into existing teaching."
Support staff	Need additional staff (departments), Office of Educational Improvement's role	11	33	"I feel isolated or like in a silo. It's like, you go ahead, you are a block director, design your curriculum, design your instructional methods. It would be helpful or reassuring to feel that there is some support for that or some sort of training."
Educational theory	Describes or mentions the use of educational theory, such as adult learning theory. Or describes the benefits of case-based learning and inquiry-based education	11	29	"That active learning is a richer, deeper way to learn than didactic lecture, that decreases achievement gaps between groups of students, that ensures long-term retention of the material and applicability to real world experiences. I'm thrilled that [our institution] is moving towards active learning strategies – which I should clarify is sort of an umbrella term for inquiry-based in case-based– both of those are different forms of active learning you get into, you know, team-based learning, problem-based learning, case-based learning, etc."
Feedback	Students: giving AND receiving Faculty: giving feedback to students, co-facilitators, and leadership	9	25	"But you know I don't always know that the student response to my teaching is the only perspective I should be getting in terms of faculty development and feedback. So, I think at some point…there needs to be a loop back where it's like OK, you did this for this last year – again, the same thing here's what you did well, here's what you need to do better, here's what you just need to stop there, just don't do this any more."

experiences with implementing specific teaching strategies, perceptions of the new curriculum, and potential faculty development strategies. Objectives included identifying components of the proposed curriculum that participants found exciting, worrisome, anxiety-provoking, or challenging, as well as identifying useful faculty development methods that would align with the time available during curriculum redesign and implementation and support skill acquisition.

After all interviews were completed, transcribed, and cleaned, transcripts were coded using a shared codebook developed by the study team through an inductive and deductive process. The study team included 2 medical students, an experienced medical educator and physician, and a medical education researcher. The team coded 1 clinical and 1 basic science faculty transcript independently and then met to discuss the codes generated. This initial codebook was then applied to 2 additional transcripts, after which the team met again to discuss coding, any new codes created, and discrepancies. Once consistency was achieved, the remaining transcripts were assigned to the team. Each transcript was coded by at least 2 study team members using NVivo qualitative data analysis software (Lumivero). Intercoder reliability was assessed via Nvivo's Coding Comparison Query feature for each transcript. Average intercoder reliability was 92%. The final thematic codebook consisted of 5 major themes and 21 subthemes (Table). After all transcripts were coded, frequencies of themes and subthemes were tallied, and the number of interviewees addressing each theme or subtheme was determined. Data were stratified by specific codes to identify representative quotations within each theme and subtheme.

RESULTS

Interviews were conducted with 8 basic science faculty and 16 clinical science faculty, for a 61.5% response rate. The major themes were: (1) preparation for the new curriculum, (2) faculty feelings about curricular implementation, (3) inputs for curricular development, and (4) concerns focused on students, along with several minor subthemes. Key subthemes– faculty development, time, and uncertainty – were prominent, with faculty raising these issues 4 to 5 times on average per interview. Other common subthemes included facilitators, skills, and partnerships. The Table displays

Table 1C. Themes, Definitions, Frequencies, and Sample Quotations

Subtheme	Definition	No. That Discused Theme	Code Frequency	Participant Quote
Theme: Concerns surrounding students				
Clinical reasoning	Students start earlier, "mimic" steps in real world, ultimate goal is patient care, enhanced integration of basic and clinical science, enhances value of basic science in clinical medicine	23	44	"You know, helping them to take the initiative to think through what they would do and whether there's certain curveballs thrown in a case, of thinking through when things don't go as straightforward as you'd like them to… there's often other obstacles and things that you have to consider in a treatment plan, and so I think there's a lot of value to thinking through not only the medicine – this is what the textbook would say we need to do – but then also taking into account the resources available and, again, obstacles that families may have to a follow-up plan, and those kinds of things I think can be incorporated really well in case-based learning."
Outcomes	Residency choice, residency attainment, Step 1 and Step 2 scores, evidence-based teaching use, increased curiosity, collaborations between faculty	15	42	"We have to realize too…that, you know, preparing them for the practice and then also making them as appealing…an applicant for residency as possible, and so the thing we have to be careful about in this is that there's a lot of moving pieces right now."
Knowledge retention	Apply knowledge consistently, recognize value of basic science	15	32	"That active learning is a richer deeper way to learn than didactic lecture, that decreases achievement gaps between groups of students, that ensures long-term retention of the material and applicability to real world experiences."
Critical thinking	Describes the need to move beyond memorization or presentation of facts. Acknowledges that students need to ask questions, be equipped with necessary problem-solving skills to be successful	13	30	"And so, teaching students how to inquire, how to critically think, is the most important skill that we teach them. So, that's really exciting, and that's what we're trying to get them to do because we deal with people and not with diseases and people's diseases don't present like they do in textbooks. They do a little bit, but not completely."
Increased student engagement	Attendance, active participation, communication with peers/instructors	12	23	"…that is usually what students find much more engaging, this is the 'Why do I have to bother learning this.' Cases demonstrate that in a very active way, as far as inquiry -based."
Student preparation	Acknowledges that students will need support in preparing and participating in case-based learning and inquiry-based education. Students may be used to more traditional teaching methods, and they will need to be able to self-direct their own learning.	10	21	"There's this really weird thing we're at in medicine right now, where there's this crisis of trust, where we will tell students to study things, give them really robust materials. Then they'll not do any of the prework that we tell them to do. Instead, they'll do their own stuff up but they maybe – sometimes rightly so, sometimes not rightly so – they have their own materials that they're able to resource so, if you flip that and just say OK, well we're going to give you the questions and the case, like you do the research, that's actually more realistic to how real physicians work and then it solves the problem of academic trust. You're not just teaching off this one textbook anymore, you're letting the students kind of find their own answers."
Prepare students for Step 1	Insufficient exposure to basic science and multitude of clinical cases, cost of review materials, need for students to prepare outside of curriculum, cases too artificial (to include all components)	8	14	"Like we just said, really it's the application of the knowledge, so that's where it's the most useful because…we're going beyond just teaching these students for Step 1… which is not all memorization but a lot of it, and then into their clinical years where they have to apply it, you know, so it's kind of that stepping stone, if you will."
Professional identity development	Students: professional identity formation, self-direction skills, buy-in; Faculty: addressing change issues	4	13	"I feel like the reason why people go to school, particularly professional schools, is they want to flourish as a professional and want to find that career that rewards and motivates them. And I think as educators, when I find myself flourishing most is when I get to have dynamic growing relationships with my learners."
Theme: Miscellaneous minor themes				
Regional campus	An issue is raised specifically about 1 or both regional campuses and their unique needs	2	6	"In the regional campus, we're already so bare bones – like, you know, during COVID when we lost a couple of people and then we couldn't bring in people from the outside, we had to 'hunker down folks, we got to do this teaching' – so I'm the course director for the LIC, which means that I'm essentially managing 7 clerkships by myself."

the coded themes and subthemes, their definitions, frequencies, and representative quotations.

The theme of preparation for the new curriculum focused on faculty members' preparation needs and their perception of others' needs related to designing and implementing the curriculum. The theme included three subthemes: faculty development, time, and understanding of new pedagogical practices. Faculty expressed excitement about the new curriculum but also voiced concerns regarding their own and others' preparedness to implement it. Time was a major concern, although discussion varied. For example, several faculty noted the lack of a clear timeline for developing course sessions. One faculty member said:

> *"I haven't seen a timeline for the curriculum … except that we know it is going to start in July 2023… I know it's going to be that foundations course, but I don't know if I am going to be teaching in that."*

Faculty were also concerned about the time required for faculty development activities and whether such activities would fit within their existing schedules. When asked how much time they could devote to faculty development, one faculty member said, *"Probably 1 hour a month would be a reasonable guess, and I'd probably miss, you know, a handful of those on busy months."*

Another preparation-related concern involved scheduling faculty development, such as facilitator training sessions, prior to teaching. One faculty member said, *"Trying to find a time that works for reviewing materials with facilitators is very challenging because… invariably people have other commitments and… I don't know that I have a good solution."*

Faculty also expressed concerns about balancing time commitments during the transitional period when the institution would run two curricula simultaneously:

> *"I think I will have the same amount of time for education that I do now. It's just that you're going to ask me to do two things at the same time. Right, you're going to ask me to run my clerkship as best I can and make meaningful improvements and you're going to ask me to develop new curriculum at the same time."*

The faculty development subtheme extended beyond discussions of time. Several faculty described faculty development as an opportunity to enhance teaching skills. One stated, *"I always love hands-on practice [faculty development]. A big pet peeve of mine is didactic lectures about active learning… I can't get over the hypocrisy there."*

The second major theme centered on faculty feelings about the creation and implementation of the new curriculum. Faculty expressed mixed emotions – ranging from excitement to concern – with uncertainty being the most prominent subtheme. Much of uncertainty stemmed from the lack of a detailed map for the new curriculum. As a faculty member explained, *"I guess what I am a little bit unsure of, and I think we'll have a better idea once we map some of the curriculum … how do you decide what are going to be important concepts."* Another said, *"we haven't figured out the specific content needs … so that's another worry."*

A second area of uncertainty involved delivering the curriculum through small groups, particularly given the shift in teaching strategies. A basic science faculty member said:

> *"You're worried about the students getting all the base knowledge that they need to get, you're worried about some students dominating the process, whereas other personalities may not be involved and will step back. It's hard, you have to really do it [small group facilitation] effectively."*

Despite this uncertainty, many faculty expressed enthusiasm for the new curriculum. A faculty member commented:

> *"The fact that the literature supports it being beneficial to the learners and supports retention of material with these methods, I think that's going to be really important as we are training new clinicians. So, that is exciting, and I also think it is more enjoyable for the learners and it is a way to reach a lot more different learning styles. And I think that is really great because we can achieve more equity in the classroom as well."*

Another said, *"I'm thrilled because it's just better education, the student outcomes are so appreciably greater across so many different disciplines, and the pedagogy literature really supports them."*

Faculty also discussed inputs for curricular development and design, focusing on the practical requirements for implementation. Key subthemes included developing curricular materials, faculty skill in creating such materials, educational theory supporting the design, and the personnel needed for implementation (ie, facilitators, support staff).

The final major theme involved concern for students, particularly regarding student outcomes and how faculty could ensure student success. Faculty noted that students' preparation for case-based and inquiry-based learning might vary and that additional support could be needed. They also expressed concern about how effectively the new curriculum would engage students and ensure that they achieved the key milestones, such as the United States Medical Licensing Examination (USMLE) Step 1 exam. Additional subthemes are described in the Table.

DISCUSSION

Obtaining faculty perceptions through human-centered design interviews is an effective way to learn about faculty needs. Faculty members interviewed offered rich perspectives and candidly discussed concerns about the new curriculum and their roles within it. Follow-up questions were rarely needed to prompt replies and were most helpful for exploring details related to previously raised concerns. The needs assessment revealed that faculty had significant concerns regarding time, faculty development offerings, and uncertainty about details of the new curriculum. Moreover, concerns within each theme often differed and overlapped with other themes. For example, concerns about time included balancing responsibilities in two curricula simultaneously, finding time for faculty development, and feeling uncertain about the curriculum's overall timeline.

Faculty needs assessments such as this are essential to ensuring new curricula are implemented smoothly and with appropriate supports in place to help both faculty and students succeed. As a result of better understanding faculty concerns, the curriculum leadership team was able to adjust plans, including reducing the number of faculty facilitators needed and incorporating near-peer teaching by fourth-year medical students. Additionally, the new curriculum includes numerous paid faculty positions for the facilitator roles, creating full-time equivalent roles that emphasize the value of faculty time and the importance of teaching students. These changes reduced the burden on already busy faculty and created opportunities for increased interaction between the incoming students and senior medical students. Studies have demonstrated the benefits of near-peer teaching for both learners and peer teach-

ers, including increased networking, greater comfort in asking questions, and enhanced confidence and skill mastery among peer teachers.[17] Furthermore, students taught by both faculty and peer teachers have comparable academic outcomes, making near-peer teaching a viable approach to supporting overextended faculty.[18]

The curriculum leadership team also addressed faculty uncertainty by introducing a monthly institution-wide newsletter, quarterly retreats, and a dedicated webpage to increase transparency regarding curriculum design and implementation.[3] The monthly newsletter provided brief updates and key information about curriculum development, while the quarterly retreats offered more detailed updates and consolidated faculty development opportunities, with designated tracks tailored to specific curriculum roles. Additionally, the intranet site served as a central repository for all information regarding the new curriculum for faculty or students who desired to learn more. Although some degree of uncertainty is inherent in any curriculum change, these efforts helped faculty gain a clearer understanding of the curriculum's goals and their roles within it.

Limitations

This study focused on one institution undergoing curricular change, which may not reflect faculty concerns at other institutions. Additionally, only faculty who were highly involved in teaching were interviewed, as the goal was to understand the concerns of those most affected by and most engaged in the new curriculum. Consequently, the perspectives of faculty with infrequent teaching roles are not represented. Further, the sample included twice as many clinical faculty as basic science faculty, which may have influenced the distribution of concerns expressed. Next steps include conducting follow-up interviews with the original 24 participants after the first year of the curriculum implementation to evaluate whether needs were met and to explore new or emerging challenges.

CONCLUSIONS

Findings from this needs assessment enabled curriculum designers to refine curricular plans and associated faculty development offerings in ways that better engage faculty and promote buy-in and support for the new curriculum. Similar human-centered needs assessments will likely be essential components of future curricular innovations at our institution and at other medical schools. Faculty play a critical role in medical education, and their comfort and excitement are vital to ensuring that students succeed in medical school and beyond.

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