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Narrowing expansive horizons: Experiences of first-year medical students and teaching faculty in a new multidirectional digital classroom for 3- and 4-year medical school programs

Kristina Kaljo, Ph.D.; Robert Treat, Ph.D.; Matthew Tews, DO

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Narrowing expansive horizons: Experiences of first-year medical students and teaching faculty in a new multidirectional digital classroom for 3- and 4-year medical school programs

Kristina Kaljo, Ph.D.; Robert Treat, Ph.D.; Matthew Tews, DO

Abstract

Introduction:
To address the country's shortage of primary care physicians and increasing medical student debt, the Medical College of Wisconsin matriculated students into accelerated 3-year campuses in Central City and Packer City, while maintaining its traditional 4-year campus in Brew City, Wisconsin. To ensure consistent content delivery within the basic science curriculum, students at all 3 campuses simultaneously participate in daily learning activities, utilizing distributed learning through a multidirectional digital classroom incorporating video-conferencing and audience response systems.

Methods:
To best uncover and understand the perspectives and attitudes of faculty and medical students, qualitative and quantitative research methods were employed framed within constructivist grounded theory. This framework is rooted in social processes of the participant's lived experiences and views these experiences as paramount to the analysis and presentation. Prospectively, data was acquired regarding individual experiences from first-year medical students and medical school teaching faculty across the 3 campuses. Beginning in the 2015–2016 academic year, 9 semi-structured focus groups were conducted with concluding surveys. These focus groups were separated by campus location: medical students at Brew City, medical students at Packer City, and faculty who taught at either the 3-year regional campus or 4-year campus. In winter 2017, the study expanded including one additional student-centered focus group in Central City. Each focus group was recorded using a hand-held device, transcribed, and analyzed using the constant comparative method. This inductive approach required close examination of the transcriptions and line-by-line analysis to assign codes that captured the emerging themes. To triangulate the data and further understand the medical student and faculty lived experiences, a concluding survey was distributed to participants. This survey included eight 7-point Likert-scale questions to further ascertain experience and overall satisfaction with the new learning environment. Numerical data was analyzed with IBM® SPSS® 24. This study was approved by the institutions review board.

Results:
In 2015–16, Packer City students rated their overall learning experience significantly (d=0.74, p<.050) higher (mean (sd)=7.6 (0.6)) than students in Brew City (6.7; 1.6) and significantly higher (d=1.21, p<.034) than the faculty (6.0 (1.0)). During 2016–17, overall learning experience scores did not differ from those of the previous years for Packer City (Δ=0.0) or Brew City students (Δ=0.0). A comparison of scores across all 3 campuses in 2016–17 yielded a significant change (d=1.28, p<.037) between the Central City campus (mean (sd)=7.8 (1.1)) and the Brew City campus (6.7 (0.5). No significant changes were reported between Packer City and the other 2 campuses. Three overarching themes emerged from both the students and faculty throughout the study: 1) The construction of a knowledge-based community of practice, 2) responsiveness to diverse learning preference, and 3) how participants negotiated teaching and learning within the multidirectional digital classroom.

Conclusion:
These findings have the capacity to provide guidance when re-designing and facilitating medical school curricula and for learners who engage in new multidirectional digital environments. Regardless of teaching site, all educators must be mindful of students' learning needs and recognize how the overall learning experience is influenced by faculty, physical environment, and the ways in which students interact with one another daily.

Introduction

The primary care physician shortage in the United States and the inevitable medical school debt crisis[1-3] has motivated many academic institutions to consider 3-year medical schools as an efficient solution to both problems.[4] As medical schools have transformed their curricula from the traditional Flexnerian 4-year biennial curriculum, 3-year programs have provided shortened academic tracks and reduced the length of medical school by nearly 30%.[5] With support from the Josiah Macy Jr. Foundation, 12 medical schools collectively formed the Consortium of Accelerated Medical Pathway Programs (CAMPP), which enrolls small cohorts of medical students to complete a 3-year curriculum.[4,6] Research reports that graduates from accelerated programs attain comparable

Kristina Kaljo, Ph.D., Assistant Professor, Medical College of Wisconsin
Robert Treat, Ph.D., Associate Professor, Medical College of Wisconsin
Matthew Tews, DO, Professor, Medical College of Georgia

milestones as those from traditional 4-year medical education programs.[1] As a commitment to educational innovation and equitable medical training, these accelerated programs are dedicated to graduating students with equivalent clinical skills and medical knowledge to those of their peers in traditional 4-year medical schools.

The Medical College of Wisconsin (MCW) is an accredited private institution located in the Midwest. Originally established in 1893, MCW operated as an independent institution since 1967 with the original 4-year campus located in Brew City. MCW recently developed 2 new regional campuses in Packer City and Central City, which offer only an accelerated 3-year medical degree program. In 2015, the Packer City campus matriculated its first class of medical students, and the Central City campus launched its program in 2016. All 3 campuses follow the same basic science curriculum during the first and second years of medical school. These are identical in content and chronology, with the inclusion of a new multidirectional digital learning environment distributing the content across all 3 campuses. Using video conferencing and an audience response system with Desire2Learn (D2L) as the online learning platform, approximately 500 first- and second-year students across all 3 campuses engage simultaneously in one learning environment over the 2-year period. A majority of the MCW teaching faculty are physically located in Brew City, utilizing a video conferencing system to interact with students in Packer City and Central City. Thus, regardless of the students' physical location, they all engage in the same content simultaneously with the same faculty during the first 2 years. The design and implementation of this multidirectional digital learning environment required input from MCW faculty, technology experts, students and staff, as well as colleagues from outside institutions. All faculty teaching in this new learning environment received professional development to effectively engage students with the new audiovisual (AV) equipment, both in person and remotely, and balance the use of asynchronous and synchronous teaching and learning strategies. Faculty development was delivered with in-person demonstrations, online podcasts, and electronic documents that could be accessed independently.

The aim of this research design was to obtain essential and immediate insights from faculty and medical students regarding the ways multidirectional teaching and learning affects the new learning environment for an established 4-year medical school campus and new 3-year regional campuses.

Methodology

The study was designed using a constructivist grounded theory approach[7,8] to provide for an exploratory, inductive approach to collect and analyze qualitative data. This method allows the researchers to genuinely capture the essence of the events taking place over the time of the study with the intention to explore the perceptions of the new learning environment. Initially beginning in the 2015-2016 academic year, students and faculty from Packer City and Brew City were recruited via email; medical students were reminded of the study through in-class announcements provided by a medical student liaison. In the subsequent year, Central City was included in the study during its inaugural year, similarly inviting students and faculty to participate in the research study via email and in-class announcements. The intention was not to compare student and faculty experiences, but to build on the knowledge gained during each participant interaction. The study was approved by MCW's institutional review board and funded by an MCW institutional Learning Resources grant.

Focus groups were selected as the qualitative method to collect rich narratives from students and faculty. All focus groups were conducted by one author (KK), who facilitated the discussion with semi-structured questions to thoughtfully engage each participant and allow emerging perspectives to come forth naturally (Figures 3 and 4, Semi-structured Interview Questions Faculty and Students). This author was not an instructor in the first- or second-year courses, and she had no preexisting relationship with any of the students that would influence the focus group or survey responses. The student focus groups in Brew City met face-to-face with KK, and the focus groups in Packer City and Central City were conducted via videoconferencing, which used a television screen, video cameras, and an audio recording system.

Figure 3. Semi-structured Interview Questions – Faculty

1. Describe your previous experiences with distance education/online learning/hybrid learning.

2. Describe your classroom setting; explain how you plan for and conduct learning experiences for the students.

3. How do you take into consideration the different learning styles among the students in the different campuses?

4. How do you typically communicate with your students before, during, and after the learning experience?

5. Describe the type of feedback you solicit from students during the learning session and, if appropriate, after the learning session?

6. Describe how you prepared to facilitate the learning experiences for the medical students.

7. Explain a time when you felt having students at the distant site detracted/was a distraction from the learning experience.

8. How well do you think this distance learning environment is preparing medical students for their future medical career?

9. If you could, please rate your overall experience with distance education (scale of 1–9, 1=terrible, 9=excellent).

Figure 4. Semi-structured Interview Questions – Students

1. Describe your previous experiences with distance education/online learning/hybrid learning.

2. Describe your classroom setting; explain how the instructor(s) conduct learning experiences for you and your distance peers.

3. How do the learning experiences meet your specific learning needs/how does this environment accommodate your learning styles/lifestyle?

4. How do you interact with your fellow students (both in the face-to-face environment and distance environment)? Who typically participates and who does not?

5. Explain the type of relationship you have with your fellow student colleagues (both in the face-to-face classroom and online/distance classroom)

6. What have faculty done well to interact with your class and the learning that takes place? How could faculty interact or instruct better with your class? What do teaching faculty expect from you regarding classroom discussion and interaction?

7. Explain a time when you felt having students at the distant site detracted/was a distraction from your learning experience at your respective campus.

8. As the year has progressed, how well do you feel like you have gotten to know the classes/students at the other campuses?

9. How is this/are these learning experience(s) preparing you for your medical career? If you could determine a specialty/area of interest you see yourself in, which would it be?

10. If you could, please rate your overall experience with distance education (scale of 1-9, 1=terrible, 9 = excellent).

All faculty focus groups were conducted separately from the student groups. Faculty attended sessions that utilized both in-person and videoconferencing, dependent on faculty physical location. All focus groups were recorded with a handheld recording device, and each session was transcribed verbatim using TranscribeMe, a transcription service. De-identified focus group transcripts were coded using the constant comparative method, an inductive strategy that fragments data line-by-line and word-by-word to construct a series of related categories or patterns that illustrate both student and faculty perspectives.[8] Upon saturation of data, these categories were organized into overarching themes. For appropriate triangulation and confirmation across multiple data points,[9] faculty and students were asked to complete an anonymous survey at the end of their focus group session (Figures 5 and 6). The survey included 9 items scored on a 7-point Likert scale (1=strongly disagree, 7=strongly agree) and one overall learning experience (OLE) scored on a 10-point scale (10=high). Statistical methods included univariate and Kruskal-Wallis analysis of variance to analyze mean and median differences across the 2 academic years and between campuses, respectively. Cohen's d calculated for effect sizes of mean differences. Relational statistics included Pearson (r) correlations and stepwise multivariate linear regressions to determine the association of survey items. Inter-item reliability was determined with Cronbach alpha, and was used to assess the internal consistency of survey data. Numerical data were analyzed with IBM® SPSS® 24.0.

Figure 5. Student Survey

Initials/DOB month (ex. CR03) _____	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1. During the multidirectional digital classroom experience, the faculty:							
a. Encouraged my participation							
b. Provided time for me to ask my questions during class							
c. Provided supportive feedback							
d. Encouraged discussion with peers							
2. The multidirectional digital classroom provides an adequate physical environment (lighting, images and sound) for faculty-student interactions							
3. I am able to adequately maintain two-way communication with the faculty in the multidirectional classroom environment using the video system							
4. I find the current design of the multidirectional digital classroom is conducive to learning							
5. I enjoyed the experience of learning with multiple sites at one time							
6. I was prepared to learn within a distance education environment							

Global Assessment. Please rate your overall experience teaching in the bidirectional digital classroom (circle one)	1 (lowest)	2	3	4	5	6	7	8	9	10 (highest)

Figure 6. Faculty Survey

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1. During the multidirectional digital classroom experience, the students:							
a. Participate in discussion at all sites							
b. Ask questions when appropriate							
c. Answer my questions promptly							
d. Use their microphones							
e. Seem comfortable with the classroom							
2. The multidirectional digital classroom provides:							
a. Adequate lighting							
b. High quality sound							
c. Clear images							
d. Adequate two-way communication with the students							
3. I find the current design of the multidirectional digital classroom conducive to teaching							
4. I am satisfied with how the multidirectional digital classroom is designed							
5. I enjoyed the experience of teaching students at three sites at one time							

Global Assessment. Please rate your overall experience teaching in the bidirectional digital classroom (circle one)	1 (lowest)	2	3	4	5	6	7	8	9	10 (highest)

Results

Quantitative Analysis, Survey Results

In 2015–16, the first year of the 3-year program in Packer City, students rated their OLE significantly (d=0.74, p<.050) higher (mean (sd)=7.6 (0.6)) than students in the 4-year program in Brew City (6.7 (1.6)) and significantly higher (d=1.21, p<.034) than faculty (6.0 (1.0)), as reported in Table 1. When student OLE scores from both campuses were combined (mean (sd)=7.0 (0.8)) and compared to faculty scores (6.0 (1.0)), there was no significant difference (d=1.10, p<.184).

Table 1. Overall Learning Experience (OLE) Mean Scores across Academic Year (AY) and Campus

Participants	Mean (SD) by AY		Δ (AY)	p (AY)
	2015/16	2016/17		
Central City students	N/A	7.8 (1.1)	N/A	N/A
Packer City students	7.6 (0.6)	7.6 (1.0)	0.0	1.000
Brew City students	6.7 (1.6)	6.7 (0.5)	0.0	1.000
All students combined	7.0 (0.8)	7.2 (1.2)	0.2	.155
All faculty combined	6.0 (1.0)	6.7 (1.1)	0.7	.050
Δ (All students − all faculty)	1.0	0.5		
p (All Students − all faculty)	.184	.132		

During 2016–17, there were no significant changes in mean OLE scores from the previous years for the Packer City

students (Δ=0.0, p=1.000) or the Brew City students (Δ=0.0, p=1.000).

A comparison of mean OLE scores across all 3 campuses from 2016–17 yielded a significant change (d=1.28, p<.037) between the Central City campus (mean (sd)=7.8 (1.1)) and the Brew City campus (6.7 (0.5). No significant changes were reported between Packer City and the other 2 campuses. When student OLE scores from all 3 campuses were combined (mean (sd)=7.2 (1.2)) and compared to faculty scores (6.7 (1.1)), there was no significant difference (d=1.00, p<.132).

Median scores for the individual Likert-scale items reported some differences among campuses (Figure 1). The Brew City students reported the highest median (7.0) scores for faculty providing time to ask questions. The Central City students rated receiving faculty feedback (median=5.5), having an adequate physical environment (6.5), and the current classroom design as conducive to learning (7.0) the highest. They also rated being prepared to learn within a distance education environment significantly (p<.050) higher than the students at the other 2 campuses (7.0). Being encouraged to have discussions with their peers (6.0) ranked higher in Packer City than in Central City and Brew City.

Figure 1. Student Survey Median Scores Split by Campus (2015–16 and 2016–17 Combined)
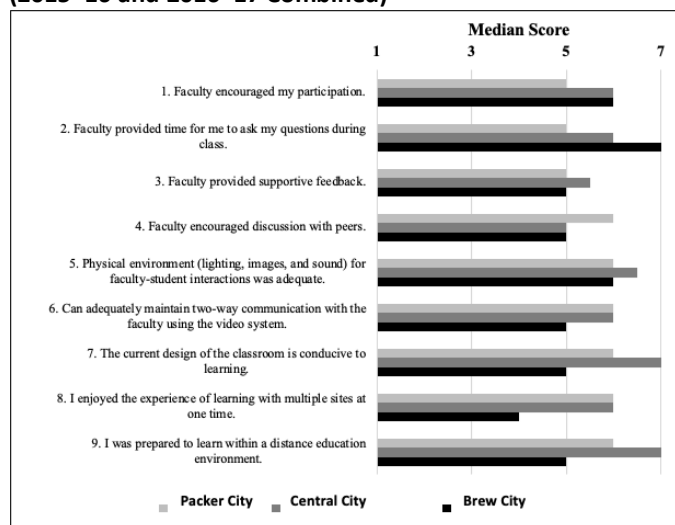
Across both academic years, the best predictor of OLE (R^2=0.64, p<.001) was learning with multiple sites at one time (beta=0.5) followed by classroom design (beta=0.4). Classroom design was rated significantly higher (p<.032) by the Central City students (median (interquartile range) = 7.0 (1.0)) than by the Packer City students (6.0 (1.2)) or the Brew City students (5.0 (1.0)).

The inter-item reliability of all 9 items was alpha = 0.70.

Qualitative Analysis, Focus Group Results

From the wealth of data acquired, all delineated codes were subsequently assembled into overarching themes. Three themes emerged from both student and faculty focus groups: 1) the construction of a knowledge-based community of practice, 2) responsiveness to diverse learning preferences, and 3) negotiating teaching and learning in a multidirectional digital classroom (Table 2. Qualitative Results – Code Book).

Table 2. Qualitative Results - Code Book

Participants		
Students		**Faculty**
Overarching Themes		
Constructing a knowledge-based community of practice	Responding to diverse learning preferences	Negotiating teaching and learning in a multidirectional digital classroom
Supporting Codes		
• Inclusion of students • Travel to and teach in GB • Develop a community of learners • Desire for mentors, upperclassmen, guidance, advisors • Bring MKE, GB, and CW physically together • Students utilize problem-solving skills in wake of challenges • Respect for learning needs • Learning together to address a physician shortage	• Expand one's own teaching pedagogy • Unique schedules, lived experiences – work/life balance • Personalized learning, tailor learning to individual • Use technology to engage/reach all learners • Methods to communicate objectives/goals • Encourage collaboration to address learners' needs • Awareness of changing learning styles	• Professional development (planning, collaboration, grades, advising, technology, communication) • Implementing a new pedagogical practice • Improve communication • Technological barriers (power outages, computer issues, sound quality, delay in sound, noise distractions) • Designing equitable learning experiences • Awareness of assumptions and perceptions/misperceptions • Varying length of time to solve technological issues • Access to content/information • Lack of face-to-face interaction with educators and students • Complexity of different schedules • Interacting with passive learners
Conclusions		
Overall barriers in the multidirectional online classroom • Technological challenges • "No name, no face" – difficult to make connections with each individual student from a distance, which may lead to isolation • Time management – anticipating lags in communication	Overall facilitators of the multidirectional online classroom • Work/life balance – flexibility to address personal needs • Being a member of a community of like-minded learners • Educators acquire unique pedagogical skills advancing into the next generation of teaching • Instilling the principle of becoming a master adaptive learner	

Theme 1. Construction of a knowledge-based community of practice. Communities of practice are defined as "groups of people who share a concern, a passion about a topic, and who deepen their knowledge and expertise by interacting on an ongoing basis."[9,10] When this characterization was bridged with the students' desire to acquire knowledge and advance in a clinical practice, the notion of a *knowledge*-based community of practice emerged as an overarching theme for both students and faculty. Intertwined in this framework is the notion of self-efficacy, or the ability to succeed in specific situations due to a positive learning environment and seeing others being successful.[11] As the students in Packer City and Central City were the first matriculating class during their respective first year, they revealed how building a knowledge-based community of learners was imperative to their own success:

"...if we have a question, we'll talk among ourselves before we truly go to anybody else to ask it, which is a lot nicer. I like the small classroom atmosphere. And again, it makes for a lot more intimate setting between the students and how we're able to work together as a team and really work on our

problem-solving skills from day one." (Packer City student, 2015)

One Brew City student explained that having another campus learning simultaneously reduced some of the academic pressure:

"I enjoyed when the professor was being more inclusive with the Packer City class, because I forget they're there all the time. Because we don't see them. And it's a nice little surprise when he calls on the [Packer City students] instead of us. It's like the spotlight's not on you. You're like, 'Oh yeah, Packer City is there, awesome. Somebody else can answer the question.'" (Brew City student, 2015)

Furthermore, a student from Central City appreciated that some faculty diligently included students from the other campuses to encourage active learning:

"One professor in particular was really good about getting us involved. There were specific questions that [the professor] would pose to us in [Central City] and call us out based on what we were wearing. [This professor] was able to involve us, which I found super helpful with how I learned the material." (Central City student, 2016)

Of note, 'community' was actively sought out by students who were eager to learn from one another and address questions in a lower-stakes environment.

Theme 2. Responsiveness to diverse learning preferences.
Faculty and students acknowledged the wide variety of learning preferences that spanned the 3 campuses and existed within individual student groups at each campus. For one student, learning preference became intertwined as work/life balance, appreciating the flexibility of multidirectional online learning,

"I've got a 2-year-old at home, and just the flexibility of the schedule makes medical school and the demands more tolerable and possible. Having everything [lectures] recorded is nice where I'm not necessarily having to plan school around my life." (Packer City Student, 2016)

Similarly, a student from Brew City also related work/life balance with their preferred learning modality:

"Sometimes I will not go [to class] because I'll just live-stream it. So, I'm literally watching at the same time as everyone else at the same speed, but I just didn't want to wake up earlier to get ready. Some Fridays, we'll just have eight-to-noon lecture and then nothing. So, there'd be no other reason for me to be here. It's just more comfortable being at home and relaxing and watching. If anything, I'm more focused." (Brew City student, 2016)

The idea of learning preferences emerged across 2 separate interpretations. One that seemed popular with students was the ability to live-stream their class and watch from home or wherever they preferred. Not every student wants to physically sit within the confines of the traditional classroom. As the curriculum integrated a system to live-stream content, anyone with access to the classroom link could watch lectures from any desired location. However, various students from all 3 campuses said they preferred to physically attend classes and interact with classmates and professors. Thus, it is significant to acknowledge that physical presence and interaction in a common space contribute to satisfaction of a learning environment.

Theme 3. Teaching and learning in a multidirectional learning environment
Even before the new campuses opened, there was trepidation about preparedness for teaching with new technology and with more variables to consider during a lecture. One common concern was that a technical problem might disrupt a faculty member's teaching rhythm and concentration, requiring them to stop and try to troubleshoot the problem. However, measures were put in place to make the experience as seamless and supportive as possible and, in retrospect, there were very few technological glitches. The faculty reflected on this in their focus groups and noted that teaching in this environment was not as intimidating as they thought it would be. They even identified this new teaching environment as a unique opportunity to improve their own pedagogical practices.

"I think how to acknowledge that you're being broadcast somewhere else is a unique skill. It's to recognize that students are at a distance and then to make sure you don't walk out of camera view and still be focused on those who are physically in the classroom where you're teaching." (Faculty, 2015).

Furthermore, as the faculty gained experience with the environment, they acknowledged a desire to supplement student learning by including additional resources to make their time more interactive: "I also think we could better use the D2L (Desire2Learn) discussion board." (Faculty, 2015). Other faculty saw teaching within this space as fairly easy, without needing to substantially change their delivery methods.

"I don't—again, I think I've said this before—I don't think the burden is there. It's pretty seamless, [teaching this way] is so easy. You just show up and do your thing and look at a screen and you acknowledge the people. I've talked to a few people who forget those students are on the screen. Just try to remember they're there." (Faculty, 2016).

Encouraging faculty to reimagine their traditional or common practice into a new multidirectional environment has the capacity to promote professional development and explore new strategies to engage students situated in different spaces.

Discussion
The literature has reported the benefits of 3-year accelerated medical student curricula, which our study supports,[2–7] By closely examining the intricate perceptions and lived experiences of medical students and teaching faculty in this new multidirectional classroom that supports the 3-year accelerated campuses, we add to this existing literature.

Extensive research and planning went into designing the multidirectional classrooms at each campus, but the development of the physical classroom space to support the multidirectional digital design was based on each campus's unique needs. For example, the Brew City classrooms had to fit the digital layout and equipment into a preexisting lecture space. Packer City remodeled existing space and incorporated distance technology and layout. Central City had the ability to build an entirely new space, integrating best practices and early lessons learned from Packer City's multidirectional digital classroom remodel. As a result, the Central City students gave significantly higher ratings to their physical environment and classroom design being conducive to learning than did the Packer City or Brew City students. The same held true for the OLE ratings. The importance of designing a classroom specifically to accommodate multidirectional digital learning was important to both learners and faculty, as demonstrated by classroom design being the second-best predictor of OLE (topped only by learning at multiple sites). The practical significance of the layout and design of a multidirectional digital classroom was clearly demonstrated between the 3 different approaches to creating the classroom for learning purposes.

As medical education continues to evolve due to diversity of learners, individuals must acquire and recognize traits that naturally help them become *master adaptive learners.*[11,12] This concept of adaptive expertise seeks to "balance the efficiency of routine expertise with more effortful learning and innovative problem-solving skills."[12] We discovered that after students and faculty were placed within the new multidirectional digital environment, both groups became adept at using various online tools to communicate with peers and faculty across campuses. This provided the ability to acquire and convey required knowledge, and recognize preferences for communication, teaching, and overall learning. In this study, students were cognizant that they must take responsibility and ownership for their learning, and educators were conscious of the need to advance or alter their own pedagogical practices. Learners and faculty had to actively couple previously acquired knowledge and skills with innovation while 'negotiating' competing demands to become master adaptive learners (Figure 2). These experiences structured the resulting overarching qualitative themes: constructing a knowledge-based community of practice, responsiveness to diverse learning preferences, and teaching and learning in a multidirectional learning environment.

Figure 2. Negotiating the Complexities of a Multidirectional Digital Classroom

Furthermore, the correlations between the students' and faculty survey ratings appears to reinforce the focus groups' findings about developing a knowledge-based community of practice. The characteristics of the adaptive learner were embodied by students at both regional campuses, who rated their overall experience significantly higher than the Brew City students. This difference may have resulted from the development of a knowledge-based community of practice for regional campus students who adapted to the new environment and worked closely with each other to learn on their respective campuses. Based on the survey data and focus group discussions, the physical absence of faculty teaching in Packer City encouraged students to develop their own community of learners to navigate the complex environment of medical school. Therefore, the overall positive experience of the multidirectional digital classroom reported by Packer City and Central City students could have resulted from the opportunity to learn in smaller, more cohesive cohorts of peers. The Brew City students, on the other hand, highly valued their interactions with on-campus faculty and being able to ask questions—alluding to the faculty members' ability to respond to diverse learning preferences. Yet all the students valued the ability to interact with the other groups of students, regardless of campus. MCW's multidirectional digital classroom and the existence of both 3- and 4-year degree programs provide a unique setting in medical education and a rare opportunity to evaluate their impact on students and faculty. This study identifies many important findings, but we must acknowledge its limitations as well. First, it is critical to recognize the small sample size. While the opportunity to participate in focus groups was advertised to all first-year medical students at all 3 campuses and to all basic science faculty teaching these students, only a few chose to participate, resulting in the potential of self-selection bias. Finally, due to the availability of individual participants, there was natural variance in participation among focus groups and between the study's first year and its second. A consideration for the future would be to longitudinally follow students from the first to second year to determine whether perspectives change and what further insights can be obtained regarding the learning environment. The reinforced use of best pedagogical practices requires the utilization of pertinent strategies for teaching in a multidirectional digital environment. The increasing interest in 3-year medical school programs and the combined use of synchronous and asynchronous learning makes it imperative that education programs evaluate not only traditional measures of success (student exams and course evaluations) but also diligently and longitudinally analyze perspectives of students and faculty through interviews and focus groups. These real-time data will best identify possible barriers and facilitators within any learning environment.
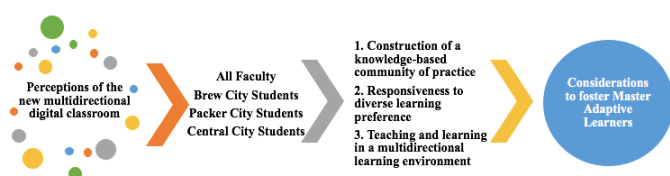
Conclusion

Our findings can provide guidance for those who design and facilitate curricula as well as for learners who engage in increasingly new multidirectional digital environments. Educators must be mindful of students and their learning needs at all sites, while students need to demonstrate a commitment to lifelong learning with the capacity to successfully navigate complex environments. By mindfully designing this study with qualitative and quantitative methods, including triangulation of various data points, and by ensuring adequate breadth and depth of data analysis, we obtained valuable insights from learners and faculty about this new multidirectional digital classroom in medical education at MCW. This allowed the research team to address the complexity of the overarching research question by obtaining insights from faculty and medical students regarding the multidirectional digital learning classroom, whereas utilizing only qualitative or quantitative methods would have limited our findings.

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