

Exploring Faculty Barriers in a New Active Learning Classroom: A Divide and Conquer Approach to Support

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This qualitative study uses an emergent design to explore the experiences of faculty teaching in a newly renovated, large-capacity Active Learning Classroom (ALC). The present study takes first- and second-order barriers (Ertmer, 1999) into consideration for a specific type of technology-integrated classroom, the ALC, and looks at faculty barriers to implementing active learning and utilizing active learning spaces. By acknowledging barriers and identifying those which are extrinsic and intrinsic, faculty and faculty support staff can begin to address barriers more effectively.

Introduction

Universities are renovating classrooms for active learning and making significant investments in furniture, building infrastructure, and technology. The efforts behind such classroom renovations are significant and require capital investment and cross-unit planning. Building renovations might include the removal and replacement of fixed structures such as existing seating, walls or dividers, and doors. The addition of new classroom technologies may require rewiring of electrical and networking services. Planning for a major classroom renovation is costly and involves coordination and planning in several areas. Technology and furniture vendors, information technology units, facilities management, centers for teaching and learning, planning committees, and faculty and student focus groups often provide input on the redesign of active learning classroom spaces.

Despite extensive planning, faculty may encounter barriers to using these newly renovated classrooms. While the renovation of classrooms often focusses on the physical space and tangible assets, a key component of this planning is often overlooked — faculty development and pedagogical support. Distinct from the training and support provided on how to access and utilize the technology and classroom assets, faculty development and pedagogical support are a vital part of the classroom renovation planning process. Additional planning in areas specific to faculty development and pedagogical support can help to eliminate barriers to utilizing active learning spaces in the way in which they

were intended thus ensuring the capital investment spent on classroom renovation was a good investment.

While any classroom where active learning occurs can be referred to as an “active learning classroom,” this study explores faculty experiences in a newly renovated Active Learning Classroom (ALC). Baepler et al. (2016) define these spaces as follows:

The ALCs typically feature round or curved tables with moveable seating that allow students to face each other and thus support small-group work. The tables are often paired with their own whiteboards for brainstorming and diagramming. Many tables are linked to large LCD displays so students can project their computer screens to the group, and the instructor can choose a table’s work to share with the entire class. (p. 10)

The ALC in the present study has a seating capacity for 140 students. Each of the 16 tables in this ALC has a flat panel monitor allowing student groups to connect their own device as they work together as a team. The instructor can view student monitors from a central technology station and select a specific group’s screen to display on a large-scale projector. Three large-scale projectors display the instructor’s screen with the ability to split between two possible “desktops” allowing the instructor to display, for example, a slideshow on one projector and student work on the other.

As one may imagine, a large, technology-filled space seating over 100 students is bound to introduce some challenges. This qualitative study explores the barriers encountered by faculty teaching in a newly renovated, large-capacity ALC at a public Midwestern university as well as the impact on teaching, faculty development, cross-campus logistics, and faculty support opportunities. Using Ertmer

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(1999) as a conceptual framework, barriers are identified and categorized. Recommendations are made for a divide and conquer approach among campus stakeholders to eliminate or reduce the identified faculty barriers.

Conceptual Framework

Ertmer (1999) classified the barriers faculty encounter as they integrate technology in the classroom as first-order and second-order. First-order, extrinsic barriers are those external factors which faculty have little control over such as equipment, availability of professional development, and time for developing and conducting technology-enhanced student activities. Second-order, intrinsic barriers are “more personal and more deeply ingrained” (p. 51) internal barriers such as motivation to try something new, beliefs about the role of teachers and students, and attitudes toward new pedagogies. First- and second-order barriers to change continue to be used as a framework for exploring faculty technology integration (Alleman et al., 2013; Shi, 2016; Wang, 2017). Ertmer’s (1999) work has since been expanded upon by other scholars. Tsai and Chai (2012) have introduced a third-order barrier, design thinking, to the classification which considers creative problem solving as another barrier in need of being addressed.

The present study takes Ertmer’s first- and second-order barriers into consideration for a specific type of technology-integrated classroom, the ALC, and looks at faculty barriers to implementing active learning and utilizing active learning spaces. Faculty and faculty support staff can begin to address barriers more effectively by acknowledging and identifying those that are first-order and second-order. Ertmer describes a “laundry list” phenomenon among educators where every potential barrier one could encounter is cited as a major obstacle to the technology-integrated classroom. By categorizing these into first-order and second-order, the “laundry list” can be approached as a team effort among campus stakeholders: those who teach, those who support teaching, and those who support ALC spaces and equipment.

Review of the Literature

A review of the literature regarding active learning practices and teaching experiences in ALCs reveals several barriers and practices being noted. These barriers are time, the need for faculty development, and faculty perceptions of their roles and value in such ALC settings. In the literature, time is the most frequently referenced barrier. Time relates to both preparation time for course redevelopment and the duration of a class period not being long enough for students to complete the desired hands-on activities. Faculty development and instructional support for integrating active learning techniques and new technologies intertwine

with faculty’s perceived role and value in the classroom. Shifting from lecturer to facilitator can be challenging for faculty who had become accustomed to traditional, lecture-based pedagogical approaches during their own college experience. Significant, but often overlooked, barriers in need of address are the motivation and incentive for making changes to one’s teaching. Technology considerations were not emphasized in this literature review, but rather teaching and learning were the focus.

Time

Michael (2007) found instructional preparation time was identified as the highest-ranking barrier to active learning by a group of twenty-nine faculty attending his faculty development workshop on active learning. Dancy and Henderson (2010) point out faculty devote a significant amount of time preparing for their lectures; the time involved in preparing PowerPoint slides, notes, and gathering reading materials can add up quickly. Petersen and Gorman (2014) found in their own ALC teaching experiences that making small, incremental changes such as revising lesson plans was more effective than attempting to redesign an entire course at once. Developing a new lesson plan does take time, and faculty do not need to redesign their entire semester around the availability of an ALC. Changes to one’s teaching can and should be incremental, especially when time is seen as a major barrier to change (Dancy & Henderson, 2010; Michael, 2007; Turpen et al., 2016).

Limited class time is certainly a barrier to change. Much of the literature has found active learning activities cannot be completed, or significant student progress cannot be made, in the class time allotted (Michael, 2007; Patrick et al., 2016). Turpen et al. (2016) found barriers to the implementation of peer instruction among university physics faculty. The faculty in their study cited time as a barrier as class time was prioritized for content coverage through a traditional lecture and left no time for active learning activities. The authors suggest “some faculty experience an emotional attachment to particular content” (Turpen et al., p. 9) and cling to the classroom techniques they observed as students.

Faculty Development

Many faculty members have not received appropriate instruction on how to implement active, student-centered instruction in their courses (Addis et al., 2013; Michael, 2007; Turpen et al., 2016). Being assigned to teach in an ALC may motivate faculty to revisit their teaching practices (Alleman et al., 2013). The “one and done” format of faculty workshops, while common in higher education, is not conducive to supporting faculty as they begin to make substantial changes to their teaching (Michael, 2007). Ertmer

(1999) emphasized the need for professional development opportunities that focus on pedagogical development rather than relying heavily on technical skill development.

Universities investing in ALC renovations should plan for on-going professional development opportunities for faculty teaching in these spaces. Faculty need on-going collaboration with peers after receiving professional development. They also need a space to talk with others about their teaching (Ertmer, 1999; Michael, 2007), and a faculty learning community can provide this opportunity (Addis et al., 2013). Without a place to share and discuss, faculty may be under the assumption that no one else is using active learning strategies in their classrooms (Michael, 2007), and this can lead to issues such as lack of motivation and low self-efficacy.

Role and Value

There is a long-held belief that faculty must first prioritize content coverage before engaging students in other learning activities (Turpen et al., 2016). The way faculty choose to teach often mimics the way they were taught as they may have found the traditional lecture effective during their own student career (Addis et al., 2013; Turpen et al., 2016). For many faculty members, instruction in teaching and pedagogical theory has been sparse. Shifting the role of the faculty from lecturer to facilitator can be challenging not only from a pedagogical perspective, but also from the perspective of their own perceived value in the classroom. The tradition of lecturing is one that is hard for faculty to shake, and this is complicated by the fear that their more traditionally-minded faculty peers may judge them for not doing so (Michael, 2007).

Change in culture at the departmental level can have a positive impact on motivation and also begin to shift deeply ingrained ideologies on the role of faculty in the classroom (Dancy & Henderson, 2010; Turpen et al., 2016). New faculty can be paired with a seasoned faculty member who has successfully implemented active learning strategies in their own classroom. Faculty that have previously taught in an ALC can begin the work of “seeding and cultivating” (Turpen et al., 2016, p. 7) more student-centered pedagogies within their department. There must be caution used in how to gauge departmental support. Dancy and Henderson (2010) point out that departments may encourage faculty to use more active learning strategies without an action plan for actually addressing and overcoming barriers these faculty may encounter.

Incentive

With no reward from administration for doing the extra work involved in implementing active learning, faculty may

be unmotivated to put forth additional effort as teaching is not universally recognized as a part of one’s scholarship (Michael, 2007). Faculty may be unwilling and unmotivated to “experiment” and take chances in their teaching (Addis et al., 2013). For some faculty, the risk of poor student evaluations outweighs the benefits of implementing active learning activities (Michael, 2007; Turpen et al., 2013). Given the capital investment being made by universities in ALC renovations, administration should consider ways to incentivize effective utilization of these spaces.

Emphasis on Teaching and Learning, Not Technology

Much like the high price tag and capital investment made towards ALCs today, Ertmer (1999) noted the large amount of money spent on technology equipment in the 1990s and brought attention to a workforce of educators unprepared to teach in technology-integrated classrooms. The technology-integrated classroom can be approached from two standpoints: one seeks equipment and the other seeks opportunities for significant student learning. Ertmer (1999) suggests the success of such classrooms are often measured “by either (a) the amount of equipment that has been purchased or (b) the amount of learning that has occurred” (p. 49). ALCs have the potential to positively impact student learning by serving as a collaborative space, by providing time and place to engage with the instructor, and by changing the dynamic of what a classroom should look like and how it should operate. However, as demonstrated in the analysis of faculty experiences in the present study, faculty may require additional support from other campus units to overcome barriers to teaching in the ALC.

Methods

This qualitative study used an emergent design to explore the experiences of faculty teaching in a newly renovated, large-capacity ALC. The study is situated at a public Midwestern university with an enrollment of approximately 18,000 undergraduates, 3,000 graduate students and 1,000 faculty. A total of seven faculty and three instructional support staff participated in this study.

Faculty participants were identified through the university’s teaching and learning center as having taught in this space. Additional faculty participants were identified through a referral sampling technique of departmental colleagues. Five of the participants were associate professors, one was an assistant professor, and one was an emeritus professor. Though they represented a range of academic programs in the field of communications, all faculty participants came from the same school within the university. Instructional support staff participants were affiliated with the university’s teaching and learning center.

The composition of semi-structured interview questions was informed by an initial classroom observation in the ALC as well as a video recording that featured two faculty participants presenting at a teaching and learning center event. In this video, the faculty shared their experiences teaching in the ALC and discussed successes and challenges within the space. Both of these participants were influenced by Baepler et al. (2016) and had previously participated in a series of on-campus workshops facilitated by the book's authors. As such, they disseminated many of the ideas and methods suggested by the authors which are also reflected in the responses of this study's participants.

Semi-structured interviews lasted approximately one hour. Participant interviews were transcribed and coded for themes using MAXQDA. Faculty participant themes then informed the composition of semi-structured interview questions which were used in interviews with instructional support staff participants. Each participant has been assigned a pseudonym to anonymize their responses.

Findings

All participants indicated that they enjoy teaching in the ALC and would like to be assigned to teach in the room again. In analyzing the barriers to teaching in the ALC, several common themes emerged which are discussed. When compared to a traditional, large capacity lecture hall, the classroom and classroom management techniques require adjustment. The ALC faculty participants were eager to share their ideas and techniques on tackling the ALC. After being assigned to teach in the ALC, several participants indicated that they pushed themselves out of their comfort zone with regard to modifying their teaching activities and teaching persona. There were, however, barriers that emerged which were out of the control of faculty, such as unmet equipment needs, technical support, and campus logistics.

Classroom

The amount of technology in the ALC may seem overwhelming for some faculty; others, however, attempt to plan their lessons around its use. Professor Cutler and Professor Baker did not place a great deal of emphasis on the technology in the room though they each utilized it during their teaching. Professor Cutler has found that when the flat panel monitors at each table are not being used, students should be instructed to turn them off: "don't overuse the monitors for the sake of using them." She also suggested visiting the ALC with a colleague and practicing with the technology ahead of time and to always have a backup plan if the technology does not work that day.

Professor Baker believes that setting realistic expectations for yourself as an instructor teaching in this room is also

important. He pointed out: "The technology is amazing. You won't use it in every single class. It's great to think you will and you're in this room and you feel obligated, and you want to, but you won't... Don't try to force it." Petersen and Gorman (2014) also noted a similar attitude toward technology; faculty should not feel pressured to use all available technologies in an ALC.

Professor Baker recommended that faculty must put their expectations aside and approach the classroom differently. For example, he points out the whiteboards in the room are not for the faculty's use. He explains: "I'm a whiteboard guy... here you don't have that option." The size and layout of the room makes it impossible to read a whiteboard if you are sitting on the opposite side of the ALC. During an observation of Professor Baker's class, a student brought up a topic regarding how to market the university's meal plan. Professor Baker naturally approached a whiteboard. Acknowledging that most of the class is unable to see what he was diagramming to answer the student's question, he talked through what he was drawing so the other students could hear.

Classroom Management

Group work and collaboration with those seated at the same table is a big component of the ALC, as this provides time and space to work together during class rather than counting on students to fulfill these responsibilities outside of class (Van Horne & Murniati, 2016). Professor Cutler allowed her students to choose who they sat with on the first day of class and they were told this would be the group they would be working in for the duration of the semester. Students were later asked if they were happy with their table and wanted to stay, and only a few students requested to be moved to another group. She made four or five adjustments during the semester after observing some tables were simply not working well together.

Professor Wilson, who found herself teaching in the ALC for the first time, attempted to assign groups several weeks after the semester had started. Students returned to class each day and sat in their preferred seats, but were instructed to get up and move once the day's activities were assigned. Professor Wilson found the uneven distribution of groups to be a challenge, as some tables were nearly full and others only had two or three students. Assigning an equal number of students to each table during the first week of class is a change she plans to make should she be assigned to teach in the ALC in the future.

Ideally, the instructor should approach every table at least once during the class period (Baepler et al., 2016). While faculty may perceive large enrollments as a major barrier (Addis et al., 2013; Michaels, 2007), Professor Cutler found ways to overcome hurdles presented by large enrollments in

the ALC. For example, she wanted to be personable when teaching in the space, but it was nearly impossible to learn everyone's name. To overcome this barrier, she would approach a table and ask what the group thought rather than calling on an individual. While teaching in the ALC requires a big personality to fill the space and maintain engaging momentum, sometimes we need to "get small" with a cluster of students. Much like Professor Cutler, Professor Wolfe also came to recognize the need for such balance in a large space.

[The ALC] is sort of a mix between the big lecture and the small discussion group. I have to be somewhere in between, but bigger and louder... When I'm lecturing in a fixed seat classroom, I move around a lot... but a lot of times I will sit down and just talk to them. And I feel like sometimes [the fixed seat classroom] allows us to have more personable conversations. Because it's just like we're sitting there and having a chat. And feel like I can't really do that in [the ALC] because there's nowhere for me to sit.

Teaching Persona

Many of the participants acknowledged their "Sage on the Stage" teaching persona in a traditional classroom carried over into the ALC but, as described by Professors Wolfe and Baker, much bigger and more boisterous. Professor Baker, for example, is someone who has the right personality to fill this large space. In the ALC, he can call upon the sage on the stage role of his teaching persona, which appears to be very important in keeping a large class engaged while being spread out across the entire room. After observing his class, I inquired how his teaching persona in a traditional classroom compared to his persona in the ALC. Did he need to boost his energy level when teaching in this space?

Oh, my goodness, yes. Absolutely. So, I call this 'the jumbo.' In my normal classroom it's a little bit more reserved. I don't have to keep drawing them back in nearly as much. If you saw today, there was at least ten times I was like 'hey folks we're not done yet' so I have to do a lot more of that. The big thing is I can't get frustrated because, just based on the room layout, it's very difficult to connect with everybody because at any given time there's a third of them that have their backs to you. So, it's something that, in this classroom, you have to focus on and make sure that you're keeping the energy up, keeping them engaged, and really moving at a quick pace as well.

Professor Ellis, however, was one participant who described himself as much more reserved in his typical classroom and labs, but transformed his teaching persona in the ALC.

When I do public speaking of any kind, I'm kind of a nervous public speaker. I don't like to stand behind something, I like to walk around. And [in the ALC], when I'm talking, I walk up and down the middle and around, so the students are pretty used to me engaging and I'm watching what they're doing... so that aspect of it I kind of like.

Teaching

Professor Wolfe shared that, while some days she would like to come to class and lecture, the ALC pushes her to rethink each day's activities:

It's important to say that I actually really enjoy teaching in there and I think it's really fun to have them doing activities. Sometimes I feel pressured to do an activity because we're in there, and there are some lectures where I just want to 'Sage on the Stage this'. And it pushes me to do new things, which can be good and kind of frustrating because you want to make sure it's something that's meaningful to the students and not just something that you're doing.

It can be difficult to make a conscious decision to lecture less, even for seasoned faculty who have had more experience teaching in the ALC. As was recognized by Turpen et al. (2016), faculty become attached to the content they have curated over their many years of teaching. Professor Blackburn shared this attachment to her course materials, but quickly realized the need to scale back on content delivery in the ALC and shift her role in the classroom.

I've probably cut down to about a third of what I usually cover. I still don't always cut my lectures down enough... So, when I first started teaching in here, I was like this is great we can do more discussion questions. And what I discovered very quickly, is that first of all, the Monday, Wednesday, Friday 55 minute [section] was not a good format... I would have to cut down on the number of topics that I would touch base on... because I was constantly running out of time [for the students] to share out. The second year that I taught in here, I cut my lectures down to less than a half an hour. Then gave [the students] the rest of the time.... Let them find [the content] out for themselves, find examples, or find the application for themselves. Which means that I have to give them more time for that. Because it's really important to have [the students] come back together to share.

Professor Blackburn found success in asking her students to go online and uncover the material themselves through

group exercises. By taking one or two of the central themes of the day's lecture, these themes can be transitioned into an interactive exercise. While it takes students longer to uncover something, compared to listening to a lecture, the students are no longer passive consumers of course content.

Small changes can be made to the course each time it is taught (Peterson & Gorman, 2014). There was very little preparation the first time Professor Blackburn taught in the ALC because the building that housed the ALC opened just prior to the first day of classes. Professor Blackburn recalls her first semester preparation as nonexistent: "I couldn't [prepare] because I didn't know what to expect, I didn't know how long anything was going to take, I just knew that it was going to be better having them interact in smaller groups." That first semester did go well for Professor Blackburn, despite some hiccups which may not have been obvious to her students. For example, she candidly shared: "The technology didn't always work... I'm surprised honestly that students didn't just kill me in evaluations."

Unmet Needs

While the ALC may be considered technology heavy, not everyone who teaches there will find the technology meets their needs. One such example, shared in an interview with instructional support staff, refers to a course in database design that required a great deal of sketching and revision on a whiteboard. Much like the observation shared by Professor Baker, the whiteboards in this space were not intended for the instructor and student visibility is an issue. A document camera on a cart was arranged for the database design faculty to sketch her database designs on paper and project the image in the classroom. While not ideal, the teaching and learning center was able to support this faculty in her teaching.

In another case of the ALC's technology not meeting the needs of faculty, a lecturer who was unable to speak loudly enough for students to hear her in the space brought a portable P.A. system to class with her. Her departmental colleagues, who typically teach in another building, also requested similar units from their department so they, too, could walk around the ALC with their P.A. and microphone in-hand. A wireless lapel microphone and audio system were later installed in the ALC to meet the needs of these faculty.

Faculty Development

The authors of *A Guide to Teaching in the Active Learning Classroom: History, Research and Practice* (Baepler et al., 2016) facilitated a one-day series of workshops on campus to showcase the opening of the newly renovated ALC. Baepler, Petersen, and Walker shared their ALC research and

teaching experiences with approximately 75 faculty attendees. Several subsequent faculty development workshops were held in the ALC, but eventually these workshops were producing low attendance and, on occasion, no attendees at all. Instructional support staff suggested the attendance dwindled because those assigned to teach in the room got what they needed in the initial workshop sessions.

An instructional support staff participant disclosed in an interview that, after the fanfare of scholars and discussion panels, the campus information technology (I.T.) department was tasked with offering faculty training on teaching in the ALC. Campus I.T. staff were not necessarily meeting the hands-on training needs of the faculty teaching in this space, taking too much time on tasks such as adjusting the classroom lighting. This finding was not surprising as campus I.T. staff are neither instructional designers nor faculty developers. The campus I.T. department was eventually asked to partner with the teaching and learning center for workshops on teaching in the ALC.

Faculty enjoy learning from other faculty as they share ideas from their own teaching (Addis et al., 2013). Turpen et al. (2016) suggests "[f]aculty may be more open to hearing someone they associate with or consider 'like them' (i.e., not an educational researcher) [who can] reassure and support them through their concerns" (p. 12). Several faculty participants eluded to this as well with Professor Ewing describing his preference for learning from other faculty rather than instructional support staff.

One year I won university professor and as a result of that I was in a workshop where they paired university professors with rising stars that were untenured. And they gave us a lot of different books and had lots of workshops for a whole year. There was a whole group of... kind of the all-star team of teachers at the university... it felt like I was surrounded by the elite. Where it was the best of the best and I learned so much from them.

A faculty learning community may be more appealing than a typical faculty development workshop for those who are intimidated by the implementation of active learning (Addis et al., 2013). Working with peer faculty (Turpen et al., 2016) and cross-disciplinary faculty (Addis et al., 2013) provides a space for idea sharing and support for overcoming barriers regarding role and value in the classroom. Workshops led by ALC faculty champions may create a more motivating environment as the implementation of active learning may appear more tangible and the results realistic and attainable.

For teaching and learning centers, positioning faculty development as a worthwhile and valuable use of faculty's

time is almost an art form. Building rapport and designing engaging faculty development curriculum is only half the battle. Professor Ewing provided a clever analogy, referring to faculty development as exercise, saying, “Once you start doing it, you’re glad you did it, you know? But until you start doing it, you’re like I don’t have time for this in my schedule. What would get me going?” Faculty development should be continuous and on-going with time and place for modeling, reflection, feedback, and support (Ertmer, 1999). Effective faculty development should, by design, address as many first- and second-order barriers as possible.

Peer Support

A common theme identified within the interviews of faculty participants was the camaraderie among those who teach in the ALC. Professor Wilson describes a class where, despite her repeated efforts, she could not get the projector to turn on. After noticing another ALC faculty walking down the hall, she called out to this colleague for assistance. The colleague knew of a special “trick” to get the projector up and running. Professor Wilson, teaching in the ALC for the first time, described the support from her colleagues as a vital part of teaching in the ALC. Professor Wolfe, who has become one of the ALC gurus in her department, describes this reciprocity of support:

The person I had connected with the most with about [the ALC] was Professor Cutler because we’ve taught the same class... and then my TA that I had once also taught in there... she had a model and everything for how to do it... so a lot of my actions in this sort of [teaching] network have been informal like that. Or I’ll be teaching class, and I’ll finish, and someone else will walk in to use the classroom next and I’ll see their eyes go ‘oh my God what do I do with this’ and I’ll say do you need help?

Perhaps key to the success of the faculty participants was their willingness to share what they do with others. The climate within these academic departments appeared to be one of trust and support from those within departmental leadership to those who teach in the classroom.

Campus Logistics

One of the more frustrating aspects of the ALC is knowing that faculty want to teach in this room but aren’t being assigned to it. Nearly all of the participants interviewed stated the ALC is no different than any other classroom on campus from the registrar’s point of view, meaning that any

course with an enrollment of over 80 students could be assigned to this space. Several faculty were assigned to teach in the ALC despite their protests, while faculty who invested time in designing their course for teaching in the ALC could not be guaranteed a room assignment. Even if a faculty managed to secure their spot to teach in the ALC, the next barrier they encountered was schedule placement: Monday/Wednesday/Friday courses run for 50 minutes; whereas Tuesday/Thursday courses run for 75 minutes. Professor Wolfe was placed on the M/W/F schedule the first two semesters she was assigned to teach in the ALC.

The biggest barrier is a Monday / Wednesday / Friday class. You cannot do anything in that class on a 50-minute schedule. You cannot use that class to its full capacity. This is the first semester I’ve gotten to teach in it as a Tuesday / Thursday and it’s been magical. I can just do so much more. Everyday I’m able to do an activity and a lecture, whereas previously if I did a lecture and an activity there was absolutely no coming back together to talk about it at the end... I just could not get it to work. So, I’ve been campaigning that if you’re going to teach in [the ALC and] use this class to the fullest extent of its powers, it needs to be a Tuesday / Thursday. You’ve got to have that time. It’s a centrally scheduled [classroom]. We don’t control it.

At the department level, an attempt is made to fit the faculty who have designed their course for the ALC into the registrar’s schedule. Even then, there’s no guarantee. Professor Wilson tries her best to communicate these needs to the campus registrar saying, “The learning curve now is... remembering which ones have been designed for that room and we’ve got to put them in there, and then you also have to factor in which ones are designed [for 75 minutes on] Tuesday / Thursday.”

Beyond scheduling logistics, central ownership of and responsibility for the ALC has become a barrier. The ALC does not belong to the school which hosts the space, but rather the university. Maintenance was described by several participants as irregular, and equipment and supplies—once staples of the space—have since disappeared. This has caused some of the faculty, who are new to the ALC, to become skeptical of its much-touted technical capabilities and pedagogical possibilities. Professor Ellis described the complexity of the ALC’s ownership and its implications on usability:

Table 1. Support Opportunities for Addressing First- and Second-Order Barriers			
	First-Order Barrier	Second-Order Barrier	Support Opportunity
Classroom	Unmet needs	Supportive culture when declaring unmet needs	Academic Department IT Department TLC
	Regular upkeep and/or replacement of supplies		Academic Department IT Department
	Ideas for classroom management	Motivation to change classroom management	Faculty Peers / TLC
		Role of faculty in the classroom	Faculty Peers / TLC
		Role of content in the classroom	Faculty Peers / TLC
		Breaking old habits - i.e. reliance on whiteboards; standing at front of room	Faculty Peers / TLC
Faculty Development	Lack of development opportunities	Don't see value in development opportunities	Academic Department Faculty Peers / TLC
Technology	Ideas and training for use in teaching	Low technology self-efficacy	Faculty Peers / TLC
		Motivation to implement technologies	Faculty Peers / TLC
	Tech Support		IT Department
Time	Time for redesigning the course		Academic Department TLC
	Room assignment on day/time of class		Academic Department
Abbreviations: TLC (teaching and learning center). IT (information technology) Department.			

Here's the thing to be honest about the room. I think it looks impressive, but I think it has some weaknesses that I found when I taught in it. One of the things is, that the technology in it, ... I don't think [the I.T. Department is] making sure that it's up to date in a lot of different ways... And I think part of it is, because it's a university classroom, no one is really coming to check on it. Whereas [the school] is checking in on all of the other classrooms in this building.

While the equipment in the ALC is up and running, computer hardware has changed significantly in the four years since the ALC was renovated. Students arrive to campus with a wide range of laptops which may require an adapter to connect to the provided HDMI or VGA cables,

such as Mini Display Port or USB-C. Professor Ellis has resigned to purchasing adapters for his class: "That's not cheap, they're like 30 dollars apiece... I think the university should be paying for that [rather than my budget]. If the technology isn't working in that classroom it's just a big room with tables."

Beyond technology equipment, general supplies for the ALC have not been addressed on a regular basis. Several participants shared that there are no markers for the dry erase boards meaning spontaneous collaboration among groups can't necessarily occur. Each table in the classroom was numbered with a table marker, similar to what one might see in a banquet hall, but these numbers have since gone missing. Each monitor was also labeled with a corresponding number at one time, so the faculty could call

up a student's monitor to the large-scale projector. A request to campus I.T. was made at the beginning of the semester to have each monitor re-identified and re-numbered at each table.

Discussion

The barriers observed in the teaching experiences of ALC faculty are summarized in Table 1 as first-order or second-order barriers, with an accompanying recommendation for faculty support opportunities. While departmental structures vary across universities, this list divides responsibilities and support opportunities among academic departments, faculty peers and/or a teaching and learning center, and the I.T. Department. Academic departments are chairs, deans, and/or those who can bring about culture change with regards to teaching norms and institutional values, and incentivize changes faculty have made to their teaching. Faculty peers and/or a teaching and learning center can provide one-to-one peer support, facilitate a faculty learning community, and provide advocacy and support. I.T. departments, or an information technology unit, would be responsible for technology acquisition, upkeep, and assessment of campus technology needs.

ALCs are designed to provide all of the classroom equipment and technology tools needed for active learning strategies; however, there are also the less tangible tools required for faculty success: professional development, a supportive community, time and place to discuss teaching, and incentives for faculty to reevaluate what they believe already works in their classrooms. Providing ALCs, though it theoretically addresses Ertmer's (1999) first-order barrier regarding equipment, is not enough to ensure faculty will use these spaces for their intended purpose—active, student-centered learning. Capital investments in new ALCs, with sleek mobile furniture and sophisticated technology hubs, are not necessarily enough to ignite reforms in traditional pedagogies and influence faculty transition to active learning in these new spaces. As demonstrated by faculty participants in the present study, even those who do wish to make changes to their teaching will continue to encounter barriers.

Categorizing faculty barriers to ALCs into first-order or second-order barriers, and identifying them as such, can provide clarity with regard to the roles and responsibility of other campus units: I.T., teaching and learning center, academic support staff, faculty, deans and chairs, and administration. A divide and conquer approach among stakeholders can be used to address these barriers rather than leaving faculty to contend with barriers themselves. However, it is important that these efforts are continuous and on-going, as Ertmer (1999) cautions "barriers may never

be eliminated completely but rather they will continue to ebb and flow" (p. 52).

Conclusion

Faculty teaching experiences in the ALC were positive and many of the barriers encountered were overcome by working with peer faculty and other support units on campus. However, the participants' experiences were certainly frustrating at times. The faculty participants were willing to share, discuss, and work with one another to make the ALC successful, and their attitudes and collegial nature likely led to the positive impact on these teaching experiences. Faculty encounter pedagogical, technical, and logistical barriers to teaching in an ALC. The identification of faculty barriers as first-order or second-order barriers, coupled with a divide and conquer approach to addressing those barriers, can begin to provide a better faculty support system for the appropriate utilization of ALC spaces. By using ALCs in the way their design was intended, aligned with appropriate pedagogical techniques, universities can rest assured that their investment in ALCs are a good use of capital funds.

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