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The Relationship between Classroom Environment and Student Course Attrition and Perceptions of Engagement

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Determining ways to help retain students in higher education institutions is becoming an issue with greater urgency with each passing year. This study looked at the possibility of learning environments as one way to influence student course attrition and student perception of engagement, using the theoretical lens of sociocultural theory (Vygotsky, 1978) by reviewing data from an institution of higher education in the Northeast of the United States. To that end, data on the number of students enrolled in one semester and correlation between learning environment and course attrition were compared (n=3298). No significant relationship was found with a phi correlation coefficient (ø = .021) between these variables, meaning that any difference between the number of students dropping or remaining in the course were minimal and likely not due to the learning environment. The sample was further investigated with a survey to determine perceptions of higher education students in either traditional or Learning Studio learning environments regarding course attrition. Findings include participant support of Vygotsky's sociocultural theory (1978), in that, participants affirmed the benefit of social interaction with instructors and peers. On the other hand, concerns about instructor competence with technology was noted as a negative aspect of the Learning Studio.

Introduction

In an era when student enrollment and retention are under increased pressure and scrutiny in higher education (Jobe, & Lenio, 2014), analyzing ways to retain the students that are enrolled at an institution of higher education and the reasons why they stay is paramount (Michalski, 2014). Uncovering the mysteries surrounding ways that institutions of higher education can reduce course, program, or institution attrition remains a focus in higher education, with no type of institution immune. When investigating the ways that student attrition decreased, many institutional, instructional, and other supportive practices have been studied, but what about the classroom environment itself? This research focused on the following research questions:

1. What is the relationship between learning environment (traditional and Learning Studio) and course attrition rates? (quantitative)
2. What are the perceptions of higher education students in either traditional or Learning Studio learning environments regarding course attrition? (qualitative)

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Traditional learning environments where students sit in rows and are expected to internalize knowledge that is conveyed by the expert through lecture would be a model often found in higher education settings, but is it the best way to help students learn? While organizing a classroom with desks in rows or tables in formal lines can assist with movement in and out of the space, it can also demonstrate a the philosophy that the instructor is the only expert in the room worthy of attention. In addition, spaces organized in this fashion offer clear sight-lines to the front of the room where information is shared by an instructor, but this format does discourage discussion and collaboration amongst students.

A shift in thinking has taken place in recent decades that while learning is often done in a receptive manner, with the instructor as expert, collaboration and socialization may contribute to the learning process as well (Montgomery, 2008). "Researchers are generally unanimous in agreement: students learn better when they can engage with one another as they learn new concepts" (Young, Young, & Beyer, 2017, p. 80). Additionally, learning environments deemed "New Generation Learning Spaces", where shifts in pedagogy, space, and technology have been implemented, with students and innovative teaching practices are embraced (Jamieson, 2007; & Radcliffe, Wilson, Powell, & Tibbetts,

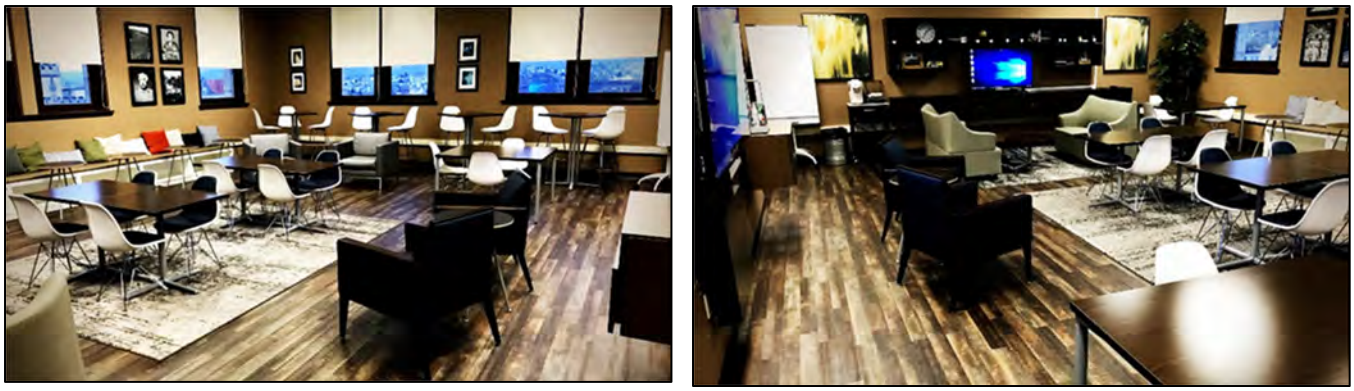

Figure 1. **Learning Studio Classrooms**

2008) have been shown to positively impact student learning outcomes and levels of student engagement (Byers, Imms, & Hartell-Young, 2014).

While the concept of enrolling, engaging, and retaining more students is paramount in this age of the diminishing population of traditional college students (Jobe & Lenio, 2014), one college in Northeastern Pennsylvania is currently focusing time, energy and resources to investigate student achievement and course attrition through the invention of classroom environments. To that end, they have partnered with the Herman Miller Company to create two Learning Studios that offer a creative, innovative and technology rich environment for student learning through active engagement. Learning Studios, according to Herman Miller (2018), are adaptable, encourage social interaction, stimulating, resourceful, and sustainable. Seating options are varied and flexible in a Learning Studio and can be arranged and rearranged according to need. In addition, spaces are furnished with varied seating options, such as softer couches, pub-style tables with chairs, traditional tables with chairs, bench-style flexible seating, desk-sized tables that can be rolled together in various designs, and the like are components of the space at this institution of higher education. Because of the flexibility and comfort provided by these new seating options, social interaction, collaboration, and learning facilitation become a focus during class time (Herman Miller, 2008) rather than a "filling of the minds" as might be perceived in a traditional setting.

Three courses at the research site offer sections in the Learning Studio environment and also offer additional sections in a traditional classroom environment. The total number of students participating in all sections of each of these three courses is 695. All of these students were invited to participate in the study. All students were included in the attrition data collection, and a sample of those who complete and those who leave the courses prior to completion were solicited for qualitative purposes. The number of students who participated in the qualitative survey was 80. Of those surveyed, 11% of the total potential sample of students meeting the criteria of taking course in both Learning Studio and traditional classroom environments at this institution participated.

The Herman Miller Company associates have conducted research at several of their sites to investigate the impact of their classroom design on student engagement and learning (Herman Miller, 2008; Herman Miller, 2009; Herman Miller 2015). In this current study, researchers investigated the impact of the Learning Studio on attrition and student engagement through both quantitative analysis of attrition, and qualitative investigation of student perception.

The literature surrounding this topic has said that traditional learning environments where students sit in rows and are expected to internalize knowledge that is conveyed by the expert through lecture would be a model often found in higher education settings, but this concept has been challenged in recent decades (Montgomery, 2008). Learning is static and rigid when learning spaces are structured in similar ways (Oblinger, 2006). In contrast to allegiance to the traditional classroom environment of desks in rows, "Researchers are generally unanimous in agreement: students learn better when they can engage with one another as they learn new concepts" (Young, K., Young, C. & Beyer, A., 2017, p. 80). With these concepts in mind, exploring various types of learning environments and studying the relationship between environment and the student is one of ongoing inquiry (Montgomery, 2008).

Theoretical Framework

The theoretical framework for this study lies in the work of Vygotsky and Sociocultural Theory (1978). Vygotsky believed that knowledge is culturally constructed through interaction with materials as well as social interaction with peers and instructors (Shabani, 2016, Vygotsky, 1978). Because the learning studio environment is different from traditional classrooms in seating arrangement, flexibility in

Figure 2. **Traditional Classrooms**

such arrangements, and inherent encouragement of student and instructor
interaction (Herman Miller, 2008), the framework of social learning is a representative framework. In addition, the design promotes problem solving, collaboration, and teamwork through organization of space in spatial arrangements instead of in rows (Herman Miller, 2008), all components that are considered vital in constructing learning in a social setting. Vygotsky (1978) himself stated that "The basic characteristic of human behavior in general is that humans personally influence their relations with the environment and through that environment personally change their behavior, subjugating it to their control" (p. 51). Additionally, Coates (2005) has supported the framework of Vygotsky's work in higher education, stating that the student engagement is foundational to the assumption of constructivism and the influence of individuals co-constructing knowledge together in activities that are purposeful, active, and collaborative.

Attrition

Attrition is difficult to measure due to the varying definitions (Ascend Learning, LLC, 2012**),** making it difficult to analyze. Another of the issues in measuring attrition is the difficulty in identifying the reasons that students leave a course, program or institution. Historically, student attrition has been defined as "a longitudinal process of interactions between the individual and the academic and social systems of the college during which a person's experiences in those systems…continually modify his goals and institutional commitments in ways which lead to persistence and/or to varying forms of dropout" (Tinto, 1975, p. 94).). Tinto's definition demonstrates how student attrition can involve many interrelated factors and studying those factors that lead to attrition can be a complex process.

While attrition is the withdrawal of students from a course, program, or institution (Ramist, 1981), retention is the conglomerate of practices that contribute to students persisting in the course, program, or institution (Mason & Matas, 2015). Several studies have been done with regard to student attrition, noting various trends and supports that can have an impact for students and institutions. Maher and Macallister (2013) reported on a study conducted in Australia where strategies were identified that increase retention of students in higher education programs. Retention of students in higher education is of utmost importance and scrutiny in recent years. Of particular interest could be conclusions from a study by Maher and MacAllister (2013) in which students inquired about the structure of classes and benefits of learning from one another in class through discussions and presentations. Additionally, course design and class environmental structure have been found to be substantial factors in determining student access, engagement and success (Errey & Wood, 2011; Kift, Nelson, & Clarke, 2010). Providing students with the opportunity to interact with peers and instructors were identified as significant factors for student achievement and retention and support the constructs of social constructivism, a component of Vygotsky's sociocultural theory (1978).

Student Engagement

Interaction with peers and instructors also lends itself to engagement of students in the class. Trowler (2010) conducted a review of the student engagement literature and identified a definition of student engagement that is prevalent in the literature as follows:

> Student engagement is concerned with the interaction between the time, effort, and other relevant resources invested by both students and their institutions intended to optimize the student experience and

> enhance the learning outcomes and development of students and the performance, and reputation of the institution. (p. 2)

Student engagement includes several components: "student feedback, student representation, student approaches to learning, institutional organization, learning spaces, architectural design and learning development" (Trowler, 2010, p. 2).

The Higher Education Funding Council for England (HEFCE) places the responsibility for engaging on students in the institution, whereas others (Krause & Coates, 2008) suggest that the responsibility for engagement lies in the effort of individual students. In combination of the two views, Kuh (2009) places the responsibility for student engagement on "the time and effort students devote to activities that are empirically linked to desired outcomes of college and what institutions do to induce students to participate in these activities" (p. 683).

According to Trowler (2010), several attempts have been implemented to increase student engagement. One such attempt is the inclusion of surveys to find out effectiveness of student engagement strategies. The act of surveying students has received support, in particular, to accommodate and encourage students who tend to be hesitant to engage actively to give authentic feedback. Although this may have a positive impact for some, this strategy does not promote social engagement with others and interaction which, according to Vygotsky, is critical for achievement (Coates, 2005; Shabani, 2016).

Classroom Environment

One method for increasing student engagement in the classroom is to develop learning communities, where students are engaged in "educationally purposeful activities inside and outside of the classroom" to increase student learning and personal development as well as "an indicator if educational effectiveness" (Zhao & Kuh, 2004). Learning communities are just one strategy for increasing student engagement. Other strategies are often directly related to the design of the classroom itself such as architecture and learning spaces (Trowler, 2010).

Young, Young, and Beyer (2017) compared a traditional classroom environment with classes taught in an auditorium. Students had difficulty hearing their peers in the larger setting and were not engaged with peers when in an auditorium, which is often used for a traditional learning environment (Young, Young & Beyer, 2017). When small groups were assigned, students were dissatisfied with the amount of time and effort it took to organize into these groups, and working with partners, where students was challenging, with an awkwardness in engaging with a partner in the auditorium environment (Young, et al., 2017). Students indicated that they preferred the smaller class environment which was noted to be more intimate and allowed for stronger focus and comprehension of the content (Young et al., 2017). Finally, the authors concluded that, although the environment alone did not have a measurable quantitative impact, the qualitative impact is more worthy of more in-depth study and examination (Young, et.al, 2017), perpetuating the need for the current study.

Classrooms that are designed to "encourage student interaction and facilitate active or team-based collaborative learning by including features such as round tables, movable chairs, student laptop connections for sharing work on overhead projectors and tableside whiteboards" (Cotner, Loper, Walker, & Brooks, 2013, p. 82) have been cited as innovative and meeting student need. Students who were assigned to the active learning classrooms (ALCs) performed to a higher level academically than those who were assigned to traditional classrooms (Cotner, et al, 2013). In addition, The ALCs facilitated more group interaction and placed less weight on the role of the instructor and the conclusion revealed that the investment in ALCs was worthwhile (Cotner, et al., 2013).

Herman Miller Associates, in an effort to increase student engagement and thus improve student performance, has created and marketed classroom arrangements designed to this end. Using concepts such as innovation, collaboration, and mobility as foundations to their work, classroom spaces are designed to enhance opportunities for students to engage in discussion about what they are learning, relate the content to personal experience and apply the new information to their lives (Herman Miller, 2008). In this design, furniture is easily mobile and technology is richly available in the environment to enable students more freedom of interaction (Herman Miller, 2008). Many components serve multiple purposes in this environment, for example, large white boards are used as space dividers as well as their intended function (Herman Miller, 2008). Results of one faculty and student survey revealed that faculty "rated highly the ability of the space to teach students to take learning into their own hands. Teachers and students alike have a hand in shaping the learning environment" (Herman Miller, 2008, p. 4). Additionally, students reported that the "furnishings and environment communicated to them a level of professionalism, trust, and value that traditional classrooms did not" (Herman Miller, 2008, p. 5).

Students reported the feeling of a more supportive environment with greater and more immediate access to the instructor and their peers in Learning Studio classrooms (Herman Miller, 2009). Faculty have reflected on an increase in student participation and stronger relationships with students and reported that students seemed more likely to establish friendships with their peers and therefore, offer

assistance to others (Herman Miller, 2009). Finally, the availability and mobility of technology also enhanced the learning opportunities, by ensuring that students are more engaged and stimulated academically with products in the Learning Studio environment than in a traditional classroom (Herman Miller, 2009). These studies and resulting attributes led to an exploration regarding the relationship between the learning environment and course attrition, as well as perceptions of students about the learning environment on factors impacting this attrition.

Design

In this study, researchers investigated the impact of the Learning Studio on attrition and student engagement through both quantitative analysis and qualitative investigation of student perception. The research questions for the study are:

1. What is the relationship between learning environment (traditional and Learning Studio) and course attrition? (Quantitative)
2. What are the perceptions of higher education students in either traditional or Learning Studio learning environments regarding course attrition? (Qualitative)

The hypothesis for the quantitative research question is:

H1: There is a relationship between learning environment (traditional and Learning Studio) and course attrition.

The quantitative piece was ex-post facto in design, using existing data from the Fall 2017 semester, and participants were not directly be recruited. The data sample included existing data of students who were enrolled in courses that met in learning studio classrooms and students that were enrolled in the same courses in a traditional environment. A phi correlation coefficient was calculated between the nominal variables of learning environment (traditional and Learning Studio) and attrition in the course.

For the qualitative portion of the study, participants were identified from the same time frame, contacted by administrators of the institution's registrar's office and invited to participate anonymously through a Survey Monkey survey.

The study is important because the institution where the research is being conducted is considering committing funding to building additional Learning Studio spaces and would want to know if these spaces are meaningful and helpful to supporting students. In addition, the company that has designed Learning Studios can use the outcomes of this research to further investigate ways that their product can support students. The outcomes of this study are helpful to higher education institutions to find ways to potentially impact student course attrition rates and learn more about the perceptions of students in their classroom experiences.

Results

Quantitative Sample

The data set for student enrollment for this study included information on 3298 students. Please see Table 1 to review the number of students in either the traditional classroom and learning studio classroom.

Table 1. **Participant Learning Environment**		
Category	**Frequency**	**Percent**
Traditional Classroom	2276	69.0
Learning Studio	1022	31.0
Total	3298	100

Additionally, please see Table 2 to see the number of students who persisted in the course and those who dropped the course. The evaluation of relationship between learning environment and course attrition was the focus of the quantitative analysis.

Table 2. **Course Persistence/Attrition**		
Category	**Frequency**	**Percent**
Persist	2018	61.2
Dropped	1280	38.8
Total	3298	100

Because the variables of learning environment and course attrition were both categorical variables, a Phi correlation coefficient was calculated. The correlation coefficient value for the relationship between learning environment and course attrition (n=3298) was ø= .021, which does not demonstrate significance. This outcome indicates that any difference between the number of students dropping or remaining in the course (attrition differences) were minimal and likely not due to the learning environment. According to these results, the research hypothesis of a relationship between learning environment and course attrition must be rejected.

Qualitative Survey Sample

Of the 695 students who received the email request to participate in the qualitative component of the study, approximately 11% (n=80) students agreed to participate in the survey. However, of that total, seven individuals were disqualified because they were under age 18 and not of the age of legal consent. That resulted in 72 participants who were eligible to complete the survey and 50% (n=36) responded to all questions. Ten respondents reflected on their experience in a traditional classroom setting, while the remaining 26 reflected from their experience in a learning studio.

Outcomes

Quantitative

There is very little relationship between learning environment and course attrition according to the results of this study. The inference from this outcome would be that students are not likely to remain in a course or drop a course based on the learning environment alone. The implication of this could be that institutions should consider Learning Studios for various reasons, but combating student attrition in courses is not one of them, based on this sample of students in higher education. Young et al. (2017) stated that learning environment may have a qualitative impact on engagement of students in classrooms, so exploration of qualitative outcomes is necessary for a more comprehensive overview of the experiences students had and their perceptions of engagement.

Qualitative

Quality of Instruction

Students who responded from a traditional perspective reported that the quality of instruction they received was very good (55%) or good (45%). This compares with students who reported based on experience in the learning studio who indicated that the quality of instruction was very good (68%), good (20%) and adequate (12%).

Sense of belonging

When asked to rate the sense of belonging, 58.33% (*n*=21) of all participants responded that they felt they belonged to a great extent. Another 33.33% (*n*=12) indicated they felt a sense of belonging to some extent and the remaining 8.33% (*n*=3) reported a small sense of belonging. Exploring the Learning Studio responses compared with the Traditional setting responses, approximately 58% (n=15) respondents indicated they felt they belonged to a great extent, while those in the traditional setting responded feeling a sense of belonging were very comparable 60% (n=6).

Aspects of Learning Studio supporting educational experience

One participant commented that "After the novelty of the first class or two there was no real difference." However, the majority of respondents provided positive comments. Support of instruction within the learning studios was indicated by participants as evidenced by the following comments:

- "The environment of the classroom and instructor presenting. Made me, and others, comfortable and did not feel like your typical 'classroom'."
- "The learning studio provides an atmosphere that makes learning feel less intimidating. These studios make classes more enjoyable because they are more laid back and tend to make the students feel more comfortable in their learning environment."
- "It was a comfortable learning environment where I felt relaxed and not too bored like in a traditional classroom setting, and focused better."
- "It was a much more comfortable environment. You see a lot less students sitting on their cell phones or laptops in these classrooms because they're more flexible and engaging. The seating arrangements helped spice things up, as opposed to coming in and sitting in the same seat behind or in front of the same person daily. Obviously, the couches and chairs were way more comfortable than traditional desks as well, and during long classes that helps tremendously. I loved these classrooms and hopefully there are more in the future."
- "The opportunity to discuss topics as a group and work together. Positive experience interacting with classmates and instructor."
- "More space, more relaxing and less stressful environment"

Aspects of Learning Studio that DID NOT support educational experience

Participants made several comments (positive and negative) regarding the aspects of the classroom environment that distracted from their learning. For example, one participant stated that "The room is so bright from all of the windows and natural sunlight coming through... for those with less pigment in our eyes, it BURNSSSS." Another participant concurred by indicating "annoying light through windows." A third participant, considering a different aspect, indicated that "At times the technology in the room was faulty and did not allow for the teacher to give comprehensive lessons." Other comments worthy of note include:

> Not enough professors know how to use the school's technology. The smart boards are a huge waste of money when all but one or two of my professors just use them to project PowerPoints. [Room] 201 also has had issues with playing sound in several of my classes, and the internet connection at the school regularly makes it hard for videos to stream. I have never been in a class that made use of all the assets the learning studios have to offer. I'd also like to specify that the lack of technology training goes far beyond the learning studios, as many of my professors don't know how to properly use the portal, the emails from LC are a mess of attachments and poorly sized or broken images, and the options for the next question on this survey aren't set up correctly (they allow one answer per column AND row instead of only one per row). Some professors do not even let us know when class is cancelled.

Another technology-related concern expressed was "Lack of electrical outlets (Room 317). I have a laptop that I used for my studies (online book, notes, etc.) and my laptop ran out of power and I was unable to use it because there were only 2 outlets in the room and they were either covered or being used."

Several other participants reinforced previous comments that there were no negative aspects of the learning studio environment. For example, one participant indicated that "There wasn't anything about it that didn't support my learning experience. I would've fallen asleep, sometimes, if it wasn't for how not boring the atmosphere of the learning studios are." Another supported this perspective by stating that "The televisions hooked up to the computers allowed for better reading than traditional projectors. The only negative is going from these learning studios back to a normal classroom."

Room configuration related to classroom discussions

Twenty-seven respondents indicated that the configuration of the classroom facilitated classroom discussion. One participant indicated that "They absolutely do because you're more face to face with your peers and professors as opposed to looking at the back of heads." Another concurred, stating "The way our room was set up supported class discussions, for sure. It wasn't your conventional everyone-facing-forward boring class set up. The ambiance of the room encouraged open discussion." Yet another reported "The studio setting makes the class feel more like a group conversation or meeting rather than a traditional class where students typically sit silent and listen to lecture. It helps students become more engaged with both their studies as well as their peers."

Only one of the participants who responded negatively elaborated, indicating that the room configuration was less significant than the instructor: "it all depends on how the teacher handles his/her classroom."

Participation

When asked if they participated in group activities in their classroom environment, more students indicated that they did so in the Learning Studio than in the traditional classroom. In the traditional classroom environment, only two indicated that group activities were used, and one mentioned that group activities were used the same in both settings. The respondents from the Learning Studio mentioned that most classes were group activities and that "the room was spacious enough to comfortably work in groups without feeling crowed by other groups and over-hearing there conversations and allowed us to work in groups more efficiently and effectively". Another student indicated that "I participated more because it was an environment I felt comfortable in to be vocal about my opinions." One final survey answer of note was one student's evaluation of the Learning Studio with regard to group activities and student engagement.

> Absolutely, in these classes the level of engagement was so much higher. My first experience in a learning studio was an 8am class, where usually everyone is lethargic. This allowed a new talking about and immediately made everyone more comfortable in the classroom. I love debating and discussing opinions, and these learning studios provided the best environment to do so. I think we learn as much from debates and discussions as we do from lectures, possibly even more.

Rapport with Instructor

Overall, responses were favorable to the question regarding instructor rapport. For example, one respondent indicated that "the instructor can move more freely around the room instead of feeling as if they have to stay directly in front of the room the room is set up to wear they can move around and when they give intersection, or lecture I feel they are more involved, and feel they are addressing each person individually." Another commented that "The learning space made the instructor get more work done if that makes sense. In a traditional classroom, some instructors rush with the information they're teaching while in the learning studios they take their time and details with whatever we are being taught."

A few responses were more neutral or negative. For example, one participant indicated that it "depends on the instructor, the room itself doesn't make a huge difference."

Discussion and Summary

While the learning environment itself did not have a strong direct relationship with student attrition in one semester in a higher education institution, students articulated various themes that did seem to impact their engagement in the course as well as their student experience, in general.

Qualitative themes and discussion

Sense of belonging

Overall, students in each setting reported feeling a sense of belonging. Students in the Learning Studio reflected more positively on the classroom environment, as a contributor to the sense of belonging while students from the traditional setting indicated that the sense of belonging was not directly related to the classroom configuration, but rather, was dependent upon the instructor and the students in the class.

Room configuration

Students in the Learning Studio reported feeling comfortable and more relaxed in this environment compared with traditional settings. Some logistical issues were identified and should be considered. These include the lack of access to power for technology, the lighting in the

Learning Studio (e.g. glare from the windows reflecting on computer screens), and the apparent lack of technology training for instructors.

Participation

Participants in the Learning Studios reportedly were more engaged in the learning process and provided more opportunities for positive interaction between peers and with the instructor. Only 53% (n=19) of participants responded to the questions asking for reflection on student engagement in the learning process. Responses indicating strong agreement from those in the Learning Studio (37%) was slightly higher than those in the traditional setting (26%). Students from the Learning Studio did indicate that they were much more comfortable offering opinions and felt more "part" of the class than their experiences in traditional settings.

Rapport with instructor

Students in the Learning Studio felt more comfortable overall with the instructor, especially when the instructor "takes a seat among us for group discussions." In addition, students expressed appreciation that the instructors freely moved about the space and students felt less intimidated by the course content in this more comfortable and relaxed environment. Others appreciated the different modes of providing instruction rather than solely focusing on lecture. Students in the traditional setting did not express specific comments regarding rapport with the instructor with the exception of a few who commented that establishing rapport is dependent upon the instructor and not the learning environment.

Based on these results, there are many positive aspects of the Learning Studio compared with traditional settings. However, areas of concern are noted by students that interfere with the benefits of the environment. For the most part, students who participated in the survey were more comfortable and expressed a higher level of learning due to the opportunities to interact more frequently and more freely with peers and instructors in the Learning Studios.

Connection to Theoretical Framework

The theoretical framework for this study was sociocultural theory by Lev Vygotsky (1978). In this theory, Vygotsky (1978) claimed that learning can only happen within the context of social interaction and with respect to the learner's culture. Students are highly social and are seeking to replicate that in their classroom experiences (Oblinger, 2006). Additionally, the current culture of undergraduate students fosters collaboration and social interaction (Chang & Baldwin, 2007) above being mere "consumers" of information (Ramsden, 2003), which is often the philosophical view of traditional classroom layouts. With trends for innovating in classroom environments to help foster these social needs, shifting from auditoriums and desks placed in rows and bolted to the floor have been abandoned for a more collaborative seating arrangement as well as other innovations in learning spaces. In the current study, student responses of the survey indicated that the Learning Studio allowed for a more open dialogue, fostering the ability to share opinions and collaborate with others, helping to build the case for increases in social connections to learning, a key component of Vygotsky's sociocultural learning theory (1978).

Implications and recommendations for future research

Students did not indicate that the physical environment of the classroom directly affected their course attrition, but qualitative themes did indicate student satisfaction with engagement and interaction in the Learning Studio. Although not overwhelmingly, higher percentages of participants in Learning Studios also noted more opportunities to participate and stronger feelings of comfort in the Learning Studio due to the relaxed nature of the room configuration as opposed to traditional classrooms. Additional exploration of the Learning Studio environment would be worthwhile, especially if the areas of concern noted by students can be addressed satisfactorily. The social connections between students and instructors as well as the relationships among students and instructors were areas that are strong factors supporting the development of Learning Studios as an option to traditional classrooms based on the findings of this study, since student comments included themes about interactivity and social interaction, which may inform inclusion of classroom environments that foster such layouts.

Finally, the comments from students regarding instructor efficacy with use of technology and innovative strategies would be worthy of further study, considering that perhaps the relationship and classroom culture could have an impact on student engagement, resulting in possible effects on student course attrition rates. Because of these comments and implication, studying the style of instruction and the impact various teaching practices have on student course attrition and perception of student engagement could be a worthy venture. Since instructors in various classroom environments can implement teaching strategies that are not necessarily congruent with the learning space, looking at pedagogical practices demonstrates potential for study.

Conclusion

Learning studios did not have a direct significant relationship with student attrition in courses at an undergraduate institution of higher education in the

Northeastern portion of the United States. Student feedback, while qualitatively analyzed, did produce themes of increased student sense of belonging, relaxed room configuration, engaged participation and collaboration, and rapport with instructor as benefits of learning studios. Additionally, modes of course delivery other than lecture were more likely to take place in a learning studio and were preferred to students in this study. Practices that promote interaction and engagement, such as collaboration and faculty-student interaction, that were notably present in learning studios have been known to positively impact student personal and academic development (Thompson, Gorin, Obediat, & Chen, 2006). Some of the challenges noted with learning studio classrooms were the learning curve for faculty with enhanced technology options, lighting, and electrical outlet availability. Further study of innovation in learning environment, methods of instruction, and student engagement with regard to student course attrition are needed.

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