5-2014

Instructor Perceptions of a Collaborative Learning Classroom at a Midwest University

Bradley S. Severa
University of Nebraska-Lincoln, bsevera@unl.edu

INSTRUCTOR PERCEPTIONS OF A COLLABORATIVE LEARNING CLASSROOM AT A MIDWEST UNIVERSITY

by

Bradley Severa

A THESIS

Presented to the Faculty of

The Graduate College at the University of Nebraska

In Partial Fulfillment of Requirements

For the Degree of Master of Arts

Major: Teaching, Learning and Teacher Education

Under the Supervision of Professor David Brooks

Lincoln, Nebraska

May, 2014

INSTRUCTOR PERCEPTIONS OF A COLLABORATIVE LEARNING CLASSROOM AT A MIDWEST UNIVERSITY

Bradley Severa M.A.

University of Nebraska, 2014

Adviser: David Brooks

There is a growing interest in the use of technology in the classroom in a way that is more interactive and engaging than generally has been a part of traditional college instruction. We see this on campuses worldwide. Research suggests that active learning as demonstrated by student engagement increases student learning. While many studies examine the learning outcomes, much less work has been aimed at asking teachers what they think of these approaches. The goal of this study is to sample some instructor's perceptions of a classroom space designed specifically to utilize technology and to provide a collaborative workspace for both students and teachers. The intent of the study is to help ascertain those features likely to be important creating new spaces for learning. This study explores instructor experiences and perceptions of such a learning space as it was used over the course of an entire semester or longer.

The room technology and design are described in detail. The instructors using the room were interviewed and their perceptions are presented in this case study.

ACKNOWLEDGEMENTS

I would like to thank everyone who offered me support and encouragement over all the years of this long process. It would not have happened without many individuals who were there when I needed the help and encouragement.

First I want to thank my advisor Dr. David Brooks. This would not have been possible without your guidance, patience and prodding. It was a long road and you helped me find a way to finish the journey. Thank you for all your effort and help.

I would like to thank Dr. Allen Steckelberg and Dr. Guy Trainin for serving on my defense committee. Thank you both for helping make a stressful situation an enjoyable process.

I want to thank all my coworkers here at UNL, they have been supportive throughout the whole process. I especially would like to thank Heath Tuttle, Todd Jensen, and Jeremy Van Hof for letting me take time off work and offering their help whenever I asked.

Thank you Toshie for encouraging me all along the way even though it meant many nights and weekends away. I could not have done this without your support.

My parents Dennis and Clara have always been there to support everything I have done in my life and it is their encouragement that gave me the confidence and motivation to pursue this endeavor. Thank you for teaching me how important learning is and for everything you have ever done for me.

Table of Contents

INTRODUCTION **1**
LITERATURE REVIEW **1**
PURPOSE STATEMENT **7**
RESEARCHER ROLE **7**
RESEARCH QUESTIONS **8**
RATIONALE FOR STUDY **8**
DESIGN APPROACH **9**
ETHICAL CONSIDERATIONS **9**
SAMPLE SELECTION **10**
DATA COLLECTION **10**
DATA ANALYSIS **11**
DESCRIPTION OF CLASSROOM: **11**
FINDINGS **13**
PEDAGOGY: 13
FLEXIBILITY OF SPACE: 17
COMFORT OF SPACE: 19
COLLABORATION OF STUDENTS: 22
OTHER COMMON IDEAS: 24
FUTURE DIRECTIONS **25**
SUMMARY **25**
LITERATURE CITED **28**
APPENDIX A. IRB APPROVAL **32**
APPENDIX B. PHOTOS **35**

Introduction

This time of change in higher education may lead to new and exciting possibilities that combine sound teaching methods with new technologies in redesigned classroom spaces. Some studies suggest that these new methods and learning spaces can be effective in creating an improved learning environment. User's perceptions of their experiences in a redesigned classroom can be a valuable tool to help guide the pedagogy of those who are considering methods of incorporating similar new technology. These perceptions can also inform the future development of new classrooms and learning spaces.

Literature Review

With the increasing popularity of non-traditional forms of education such as Khan Academy (Thompson, 2011) and Massive Open Online Courses (MOOCs) (Martin, 2012), it is relevant to examine specific interventions at various colleges and universities. While new approaches may be popular, there are questions as to their efficacy. For example, Khan Academy and MOOCs do not offer accreditation to students and do not lead to certification or a degree. Nevertheless, many traditional institutions feel pressure from these entities that may have an effect on enrollments.

King and Sen (2013) comment on traditional universities; their funding resources are lower in recent years, and their students have many alternatives today through resources such the Kahn Academy.

The size of MOOC courses have raised concerns on how they deal with students of different levels of competency. Martin (2012) asks whether they can address being able

to help students who are falling behind while not engaging more advanced students as well as in a traditional face-to-face course.

There now are new higher education options for students to obtain an accredited degree from organizations such as Phoenix and Kaplan. These entities have had high enrollments (over 300,000 and 77,000, respectively, in 2011) (National Center for Education Statistics, 2012) In spite of criticisms concerning similar institution's low placement and graduation rates, enrollments in these and similar schools have more than tripled since 2000 (Barrow, Brock, & Rouse, 2013).

Budget cuts at public institutions in the United States have resulted in tuition increases but lowered enrollments. Most countries in the Organization for Economic Cooperation and Development are taking steps to ensure that their higher education institutions are not in danger of budget cuts due to the world recession (Douglass, 2010).

Lester (2013) argues that a threat to higher education institutions in the United States is competition from foreign institutions that will offer programs online that are accessible from anywhere there is an Internet connection. He goes on to state that eventually traditional universities may not exist due to the threat from online entities providing high quality education at a lower cost to students. He sees this as a positive development for consumers of higher education, but notes that it will be disruptive to educational institutions as they currently exist. This sort of disruption is something that may have a strong impact on how faculty members teach in face-to-face courses.

In a study on environmental interaction of general purpose classrooms, both professors and students felt that standard lecture classrooms were not flexible enough and did not provide a setting conducive to social interactions(Scott-Webber, Marini, & Abraham,

2000). Technology implementation in the classrooms was also criticized for not being well thought out and even becoming a handicap for the users of these spaces.

One study compared active learning pedagogy use in a traditional classroom and one designed to be more collaborative and found that there was no increase in the use of the active learning pedagogies (Beery, Shell, Gillespie, & Werdman, 2012). The authors did note that there may have been some bias present in the team that conducted the analysis for this study. The teachers observed in this current study were also using active learning in the lecture style classroom; this may illustrate that there is still no firm consensus on this type of instruction being better than traditional lecture style.

Faculty and student interaction was discussed by the teachers in this study, and their comments were echoed in another study that used Pod Rooms which incorporated collaborative spaces (Wilson & Randall, 2010). The faculty and students in that study noted that the interaction between students and professors was better due to better communication. They attributed this outcome to the flexibility of the space.

Instructors in this study were willing to try methods that incorporated collaborative instruction in the classroom. Is a collaborative learning space accessible to these instructors? What does it take to adapt pedagogy appropriately?

Some research suggests this is a more effective way to teach. The TEAL Initiative at MIT showed that courses in electricity and magnetism using interactive cooperative learning techniques had higher scores than students who took the same course as a traditional lecture style (Breslow, 2010). Hake (1998) found that Interactive Engagement was more effective in physics courses in an analysis of 6000 students' test data. Peer Instruction was considered to be useful by over 80% of instructors in a survey of 384 instructors using

this method of instruction; data from testing by 108 of these instructors showed increased scores in these courses (Fagan, Crouch, & Mazur, 2002). North Carolina State University implemented the SCALE-UP Project for an introductory physics course and reported the following:

"Our comparison findings can be summarized as the following (Robert J. Beichner et al., 2011):

- Conceptual understanding is increased
- The top third of the class show the greatest improvement in conceptual understanding.
- Ability to solve problems is as good or better
- Attitudes are improved
- Class attendance is higher, typically > 90%
- Failure rates are drastically reduced (typically 50%), especially for women and minorities
- Performance in the second semester physics class is improved, whether taught traditionally or in SCALE-UP
- Failure of at-risk students in a later Engineering Statics class is cut in half "

The reported better attendance and lower failure rates suggest that this type of instruction may lead to increased retention rates. Many college instructors may wish to make changes in the way they approach classroom instruction as a response to technology pressures if this raise enrollments and retention rates.

This kind of large-scale change can be met with resistance, however, and has been a threat to programs that are experimenting with this style of classroom. Resistance to the

TEAL Initiative was reported from both faculty and students at MIT (Breslow, 2010). Approximately half of the faculty present at a meeting discussing the use of TEAL opposed this manner of instruction.

Fagen et al. (2002) also noted that ten percent of faculty reported that their peers were skeptical of moving instruction away from lecture-based models. Students were not initially comfortable with active participation in the classroom, but responded favorably as they became more familiar with the new method. A faculty member adjusting curriculum for a studio space teaching environment noted that previous implementations of similar pedagogic changes resulted in poor course evaluations that were negatively noted in their performance review by their dean (Taylor, 2009).

In flipped instruction, reading and preparation is done prior to class attendance, and class time is devoted to responding to questions and discussion as opposed to traditional lecture followed by outside-of-class study. Students in an engineering course provided feedback on how often to use the flipped classroom model (Zappe, Leicht, Messner, Litzinger, & Lee, 2009). They indicated that "flipped" instruction was used more than needed, and that about 50% of the time in the flipped mode would have been adequate.

Osborne et al. (2011) explained how faculty were frustrated with new technology being implemented in a blended learning environment. Instructors who were more willing to learn about the new technology reported lower levels of frustration with the new equipment.

For technology to be beneficial in a classroom it needs to be implemented properly. In a paper on laptop use at the University of Michigan, researchers noted that the laptop can be an aid to learning as well as a distraction (Zhu, Kaplan, Dershimer, & Bergom, 2011).

Students felt it aided in their learning when appropriate learning tools were used by the instructor in the classroom. The paper suggested various guidelines be used for laptops in these classrooms.

It is necessary to consider the costs involved in the set up of this type of classroom. Increasing efficiency by utilizing better diagnostic tools and standardizing hardware and software are ways to lower costs for these spaces was suggested by Johnson at Arizona State University (Oblinger, 2006).

One study (Miller-Cochran & Gierdowski, 2013) in which four different types of classrooms were created for a writing program showed that, in rooms with flexible designs, students would provide their own computers and this was less expensive than a room designed with provided desktop computers. The long-term costs were considerably lower due to not having to upgrade computers every few years. In an environment of shrinking budgets, transferring some costs to students (laptops, tablets, smart phones) while using institutional resources to maintain technology in classrooms may become an attractive alternative to providing all of the needed hardware.

Research indicates that the environment of the classroom can have an effect on the students' interactions with one another. A study on design studio classrooms states that some layouts were more conducive to social interactions between students than others (Obeidat & Al-Share, 2012). Furniture was a major factor when considering a studio design in which group and individual workspaces were dependent on amount of space and type of furniture used (Osborne, Franz, Savage, & Crowther, 2011).

One benefit to this type of instruction in the SCALE-UP model was that the layout of the room allowed for more interaction between instructors and students, specifically noting

that students could not “hide” in the middle of a lecture hall row of seats (Beichner & Saul, 2003).

Cornell (2002) makes a case for requiring different approaches to instructional design in which furniture should be considered with four things in mind: functionality, comfort, safety, and health. Architecture and technology combine with these factors to become a critical part of the educational process to prepare students for the new knowledge economy.

Purpose Statement

The purpose of this case study is to describe and better understand instructor perceptions after using a test classroom designed around collaboration and practical integration of technology. This study is a bounded system of a particular test classroom at one Midwest University over the course of one semester. The instructors were practicing faculty at the University who volunteered to teach in the classroom. They were provided any technical and instructional support needed and encouraged to use the room in any way they desired.

Researcher Role

The researcher is employed by the Information Technology Services Department at that University. A part of his job was to manage and schedule this learning space. He was "the gatekeeper" of this area since he scheduled all the faculty included in this study. As a result, the researcher already had a working relationship with the instructors who used the room. One of the three instructors was teaching in an older design of the room prior to

this study. The other two instructors started after the room was redesigned. The researcher was present in all of the instructor's courses from time to time due to being the main contact person for this room. He helped provide technical support when needed. Materials produced by students in these courses were observed directly by the researcher.

Research Questions

How do technology and classroom design affect instructor perception?

- What was instructor perception of instructional methods affected by using this classroom?
- What were the instructor's perceptions of the technology used in this room?
- What were the instructor's perceptions of the design choices made for this classroom?
- Why did the instructor want to teach in this classroom?

Rationale for Study

This study was conducted in a classroom that was designed by the Information Technology Services Department with some input from one instructor who had taught in that room prior to the remodel. This study dealt with one semester after a full year of use. The intent was to discover how the instructors using the classroom perceived the design of the space and the technology being incorporated into the space.

There are studies that discuss this kind of environment from the student point of view. Few have discussed the instructor's point of view, however. Understanding instructor's

motivations for teaching in a space such as this will be useful information that may be applied to future classroom designs.

A qualitative study was well suited to this goal; it provides guidelines for generating a conversation with instructors about their perceptions both physical and technological aspects of the learning space environment.

Instructor perceptions about teaching spaces are important. What motivates instructors to want to teach in such a classroom in the first place? Determining what makes instructors most comfortable when incorporating technology with classroom design can lead to creation of more effective classrooms for instruction.

Design Approach

Since only one particular classroom design was set up to service academic teaching, a collective case study was determined to be the best approach to studying teacher perceptions. Three instructors were scheduled into the room for a semester. Their technology use was supported as much as was required; learning new technology was *not* an issue for them. They could use the room and explore any options they wished.

We can gain a better and more in depth understanding of what it is like to use such space as in college teaching by examining the three resulting teaching experiences.

Ethical Considerations

Ethical considerations are minimal in this case. The three instructors were willing participants and their anonymity was maintained. Students were not interviewed; this

case study focused only on the instructor's perceptions. The labels Professor 1, Professor 2, and Professor 3 are being used when referring to the instructors in this study. General questions were asked about the instructor's experience of teaching in the classroom. IRB approval is displayed in Appendix A.

Since the researcher has a working relationship with all three instructors, there is some concern on keeping their identity confidential. All three instructors were informed that their identities would remain confidential.

Sample Selection

A convenience sample of three was chosen because only one specially designed and equipped classroom was available.

The three instructors have the same basic view of the room and had previously expressed intent to continue using the space. One of the instructors did express a concern that they might not be able to take full advantage of the room and were worried that they would not know how to use it. This was someone who was comfortable with technology but was changing his pedagogy to accommodate a new environment. The three instructors were familiar with the majority of the technology used so this was not a major issue. Finally, support staff occupied an adjacent room so, when problems arose, instructors were able to find help immediately.

Data Collection

The principal method of this study was interview. Three professors who have used the classroom over a semester of the last academic year were interviewed. One full time staff member who was an adjunct instructor in the classroom also was interviewed. His was a

pilot interview that was used to fine-tune the questions to help gain a better understanding of what the instructor's experiences were over the course of the semester.

The site of this case study was chosen based on its design as a collaborative learning classroom. Only three professors have conducted classes in this space; for this reason, they were asked to participate in the study.

Data Analysis

Interviews with the three professors were the principal source of data. The taped interviews were transcribed manually using *Express Scribe*, an audio player software which aids the transcriber with transcription. They were coded for common themes using *MaxQDA*, a qualitative data analysis software, which was then used to analyze the data. Questions considered while preforming the analysis were: What were the similarities and differences in each teacher's experience? What were common themes to all teachers? Was there a perceived advantage to this particular learning space for teachers? Did issues emerge that were likely to help create better classrooms for other instructors?

Description of Classroom:

The technology utilized within this classroom learning space includes four projectors (Appendix B, Photo 1) that can present the instructor's computer, a guest laptop, and a document camera to one or all screens. These operations are manipulated from a control panel (Appendix B, Photo 2) on a wheeled instructor podium that can be moved around the front and middle area of the room on an umbilical (Appendix B, Photo 3). The podium also has a *MacMini* computer (Appendix B, Photo 4) capable of booting in either *Mac OS* or *Windows*, with a LCD monitor attached to a swivel arm, a laptop platform

also on a swivel arm, and a document camera (Appendix B, Photo 5). Each device can also be displayed individually on any of the four screens. One *Apple TV* (Appendix B, Photo 6) is connected to each of the projectors in the room and content can be streamed wirelessly to them via *iPad2's* (Appendix B, Photo 7) that are available to professors and students during the semester. There are also *iPad1's* (Appendix B, Photo 8) available for checkout to students for the semester. Instructors can also use *iClickers* (Appendix B, Photo 9), a student response system available for use in the classroom. The furniture in the room consists of 20 chairs on wheels that also fold up for temporary storage (Appendix B, Photo 10), 4 red cushioned wheeled chairs with swivel desk platform (Appendix B, Photo 11), and four kidney shaped wheeled tables (Appendix B, Photo 12) with power strips attached (Appendix B, Photo 13).

There are nine floor plates (Appendix B, Photo 14) that contain 8 ethernet connections, two three-prong electrical outlets, and a port for projector hookup on four of the corner plates each corresponding to the nearest projection screen. There are also two mobile white boards available for use in the classroom (Appendix B, Photo 15).

There is also a laptop cart (Appendix B, Photo 16) that contains 15 *Mac Book Pro* computers (Appendix B, Photo 17) that are dual boot to *Mac OS* or *Windows*. They are loaded with the standard Internet browsers: *Firefox*, *Chrome*, *Safari*, and *Internet Explorer.* Other software installed include: *Adobe Creative Suite*, *Apple iWork*s (applications for creating and editing presentations, publications and spreadsheets), and *iLife,* (applications for editing photos, movies, and music); as well as the *MS Office* package. If special software is needed for a course, it can be installed for the semester in most cases.

The room also has wireless Internet access and can handle all the laptops and other mobile devices being used at the same time without loss of connection. The room has been set up in various configurations during the course of this study. Tables were most often set up in a group formation (Appendix B, Photo 18). Chairs were also set up in the round for discussion sessions (Appendix B, Photo 19). Tables can be pulled aside and the chairs can be moved into a more traditional row set up (Appendix B, Photo 20).

Findings

The three instructors each discussed various aspects of the course they conducted while teaching in the collaborative learning space classroom. Professor 1 instructed an honors music course, Professor 2 a digital humanities computer programing course, and Professor 3 an English writing course. The professor's genders are not noted and are referred to as male to aid in keeping identities anonymous, quotes were not altered. Four themes that emerged during the coding process, which all three professors discussed in their interviews were: pedagogy, flexibility of space, comfort of space, and collaboration of students.

Pedagogy:

When instructors in this study were asked about their pedagogy in this classroom environment, a theme that was common to all three was that this space allows for increased engagement of both faculty-to-student and student-to-student interactions. They attributed this increase to both the ability to reconfigure the furnishings, and the ease of the instructor to move around within the space.

Professor 1 commented that it was an easy space to move around which allowed him to more effectively facilitate group projects with students as they were working during class.

Professor 2 noted that the layout of the room contributed such that students were more willing to show when they were confused and to ask for help:

> *I think one thing every professor wants is that they really, really do want their student to ask questions when they are confused.*

Students used laptops in this classroom; this made it easier for students to see one another. Instructors believed this allowed for more student-student and student-instructor interaction. Professor 2 noted that this was not a particular change in how he taught; it simply worked better in this space.

> *Now is that a change in what I was doing? Um, no I don't think it was it was just that now it works.*
>
> *I just think it makes for a nicer rapport and again I'll say I think in this room it just it's just easier, you know because it's just more intimate.*

Professor 3 felt that the ability to move around the space more easily than in other classrooms had the benefit of his being able to better adjust his lesson plan based on increased interaction with student conversations.

> *the room and the technology means that I can change it, in the moment or in the three minutes before classes I'm listening to them talking and I can hear what they're worried about or thinking about, um you know I can instantly create like, oh, I can tell the problem to the reading and with a quick reading quiz and I can create that in two minutes using a Google survey*

The instructors liked having moveable furnishings that aided with group work on projects and classroom management. They utilized the mobile white boards in the space to create dividers between working groups as needed.

Each instructor also discussed, to varying degrees, the integration of technology into their pedagogy while teaching in this classroom.

Professor 1 spent much of the discussion concerning pedagogy talking about how technology was utilized in the classroom space. They saw an advantage to having the same software platform available to all students in their class. In this case it was the fact that all the students had an *iPad* checked out to them for the semester and also had access to use a *Macintosh* laptop in the classroom whenever needed. This allowed the professor to create an interactive textbook for the course using *Apple's* eBook publishing software *iBooks*. This book was distributed to the class through the checked out *iPads*. Professor 1 was also able to distribute class presentations using the *iPads* so that his students could view it during the presentation.

Professor 1 liked having the freedom to try new technology. He expressed the notion faculty may require a certain textbook for a class but that this approach allows any technology platform that the students bring in and does not require that *iPads* be used.

Professor 2 noted that having laptops available was an advantage students did not have to worry about owning a laptop. This allowed him to plan for a class where everyone would have access to the appropriate technology required to implement his lesson plan.

Professor 3 commented that the technology in the classroom did not get in the way of classroom activities. He also noted that the particular technology students used in class could be a distraction. He had to manage that; he felt that there was a time to use the

technology and a time to have open discussions instead. This was something they believed was easier to evaluate in this space due to being able to interact more closely with the students.

> *I'm still learning about how to observe and watch for signals and like you know I think maybe you guys should sit and talk*
> *… it's all just the usual assortment of getting to know and, engaging with students but I think the movement in the space made a huge difference.*

Professor 3 was able to incorporate more collaborative activities into his pedagogy as a result of teaching in this space. One such activity was creating *Google* documents on one screen in which student groups participated in an interactive discussion of a video being displayed on the other screen. This professor felt this was a very good way to get immediate feedback from the students and allowed for a different way of approaching an activity.

In another activity, Professor 3 used shared documents again to have students work together to create a video for a group assignment. Professor 3 expressed the view that this strategy worked very well in this case and that his students seemed to enjoy working on the project while producing high quality work.

> *And that again was, those probably for this group the most successful that they really enjoyed it they came together and they worked really hard*
> *one day of discussion then the next week two class periods putting it together and they were done. And they were good; yeah they were really pretty good*

The next time he utilized this approach but while using a slide presentation assignment, but this time he felt the presentations were of a low quality.

> *then the second remediation was they had written an argument um, proposing sort of a public policy change and then they had to present it in the slide presentation and those were horrible.*

Professor 3 thought this might have to do with students being more comfortable and familiar with the medium of video than slide presentations. He also noted that the technology used is not the only factor in making a new method successful, and that instructor interaction may have been a contributing factor.

Flexibility of Space:

The flexibility of the classroom space was the second most discussed theme among all three instructors. They spoke about how the ability to move around the room with more ease than within a traditional classroom made a noticeable change in their interactions with the students.

Professor 1 liked having the flexibility of being able to reconfigure the chairs and tables in this space. He noted that the students would self organize in this space unlike other classrooms they have taught in.

Professor 2 took advantage of the mobility of the furniture to conduct multiple types of classroom sessions. Once a week he would hold a seminar session where everyone would sit arranged in a circle to discuss a selected topic.

Professor 3 felt that the ease of movement around the room made a big difference in creating more engagement with students. The instructor was able to better position

themselves in the classroom where needed to either keep students on track or to encourage them to participate more in the discussion.

All three instructors mentioned having four screens available in the space. They all felt that the screens created a better viewing experience for everyone in the classroom. Professor 1 used the multiple screens to display different content simultaneously, with one screen showing notes and the other showing a demonstration on an *iPad*.

> *I've started doing using both screens with different content on the two screens, so because I have that ability I started doing that so I'll have a laptop, slides or maybe the* Blackboard *rendition of the course, syllabus something I am pointing to or reading on one screen and then I'll put my* iPad *display on the other screen to have, you know, multiple things that can go back and forth rather quickly."*

Professor 2 commented on how the screens position in the space worked well for him.

> *this room has a, screens everywhere, there's actually no bad sight angle in the whole room, right? That's great!*

Professor 3 taught a writing course and also found the placement of the screens useful for students while they were viewing text being presented.

> *I didn't use all four all of the time but, but I, I would often put them all up because, um since I teach writing and there is so much text it is really hard to see a page of text from even this close a distance and so having it all around made it a lot easier for everybody to see what we're doing*

All three commented on the sound system in the room. Professors 2 and 3 both felt the sound worked well and enhanced their activities. Professor 1 felt the sound was not adequate for his course. This may be due to the fact that Professor 1 often conducted

student presentations using a single projector, and this caused the sound to route through the sound system of a that lone projector rather than the higher quality room-wide sound. All three commented on the benefits of having laptops available but for different reasons. Professor 1 talked about how having a single software platform on the laptops available to students in the classroom was easier to manage than having each student bring their own computer to class. This professor also used his own *iBooks* textbook on *iPads* for most of the coursework in this class.

Professor 2 discussed the issue of being able to have computers available for all students regardless of them owning their own and bringing them to class. This enabled the professor to plan course work that required each student to have a laptop to work on without having to make bringing a laptop to class a course requirement.

Professor 3 noted how easy it was for students to work on the laptops in the classroom and then transition quickly to a discussion.

> *I love that everybody has laptops rather than desktops I think that you know it's just so much more flexible and, and, easy.*

Comfort of Space:

Professor 1 talked about how the classroom was a pleasing and pleasant space to be in; he felt that the size of the space and the way it is organized were both contributing factors.

> *You know you walk in you have a sense that it's going to be a comfortable space, you also have a sense that you don't all have to be doing the same thing at the same time.*

He also commented that the layout of the room gave the impression that this is "not your normal classroom" and a person should be able to be more independent.

Professor 1 noted two negative aspects of the comfort of this space: It is not conveniently located on campus (not easy for students to access); and the hallway to the room has poor lighting.

Professor 2 discussed the comfort in relation to the course he was teaching in the space. This was a programing course for non-computer majors, and Professor 2 felt that this is perceived as an intimidating subject for most students. He believed that the way the room was set up helped the students calm down and become more open to the subject.

> *I think it just turns off a lot of their automatic reactions to, or automatic associations with school, that's hard and you know all that kind of stuff and they, and they just, they just calm down*

He went on to talk about how students seem more open to asking for help possibly due to the space being different from other classrooms.

> *I think they are more open to being confused, think they are more open to saying I don't, I'm not, I'm not following this or I'm not getting this, I mean so and now is that because some of the chairs are red or is that because it's sort of octagonal, or sitting you know, I mean I don't know?*

Based on his observations of how students react to this space compared to a traditional lecture hall, Professor 2 noted that he now has a different opinion of how the layout and colors of a space can affect the occupants.

> *it makes me want to give more credence to, you know when people who do, ah, industrial design and interior design … I mean it really does change the way people talk and move in the space when you change the, the simple things like the colors and the furniture*

He discussed how the coat racks in the space might remind students of home or elementary school and contribute to an atmosphere of creating a feeling of fun and that learning is fun in this space. They also commented on the coatrack making students feel at home.

> *the act of taking coats off sort of means you're welcome and you're home*

Professor 2 talked about how the comfort of the space affects the relationship he has with students in this space compared to more traditional classrooms. He believed that the space aids in creating better rapport with students, which is something he feels is a positive aspect of his interactions with their class.

> *I just think that like education probably goes better when the professor and the students aren't totally, uh, cut off from one another … I think in this room it just it's just easier, you know because it's just more intimate.*

He went on to discuss how he observed that student's behavior was changed in this space by their actions before and after the class was officially out of session. He noted how students don't leave immediately after the class session is over.

> *people linger almost always you know isn't that, funny, I mean ah, ah I mean it's not a bar, you know, … let's not get carried away here, I mean but, but, you know something makes people want to, what to hang out, I mean that's good. It's really good.*

He also talked about how he made himself available before the start of the class session and how student behavior compares:

> *If you're in a class with rows, man, you can sit there all day right, no one is going to come in, they might but only if they have a problem. Whereas here I come in, and man, they are, they are, we're just, you know, I have to stop, guys we have to have class*

Professor 2 talked about how much he liked the technology in the room but felt that the layout of the space was more desirable to them:

> *I would rather have the tech not work, than have than have a place that, that just seems like a lecture hall, I really would, I would, I would rather have tech breaking than, than be in this what seems to be just a really unfriendly environment.*

Professor 3 talked about how he felt comfortable with how the technology worked in the space so well that it was not in the way for him. He briefly discussed how they are comfortable in this space to the point of being fearful of losing access to this classroom:

> *I can't imagine not being in a classroom like this and in fact I'm terrified about losing this space and losing access to it*

Professor 2 also commented on the possibility of not having access to this classroom:

> *I just love it, it, it, it fits, uh I've grown very, I mean I, I despair of having to go back to a, to a class with, would, to either a class with rows or a class where the tech doesn't work*

Collaboration of Students:

Professor 1 had incorporated collaborative assignments in his courses prior to teaching in the new classroom. He indicated that the space provided a greater ability to engage in collaborative and group work and he increased these sorts of assignments after teaching in the space.

One example Professor 1 cited was a group project assignment where the students previously organized themselves into groups based on the subject they were interested in; in the new space, they organized themselves based on where they had already worked as determined by the tables they had been sitting together at during the course of the semester.

> *This time they all grouped themselves based on where they sit in the class … they actually formed the groups first not based on the topic at all*

Professor 1 noted that the class started off quietly but, as things moved on, student interactions with one another other increased:

> *they get pretty interactive and there's enough, they stay on task and a lot of the things happen that way.*

Professor 1 created more directed practice and group work in his course. This enabled students to do more hands on work. It was not difficult to manage because the classroom size was around 20 students. He noted that having groups doing their own thing is challenging for the instructor.

Professor 2 discussed how the comfort and intimacy of the space allowed for better collaboration, to such a degree that students started interacting before class started and the instructor would have to interrupt to begin the class.

Professor 3 commented on how effective the tables were when being utilized to incorporate work on laptops with discussion activities.

> *being on the computers and then engaging in conversation or activity and then back on the computers and that could happen seamlessly in*

> *a moment, it was huge just how that really made the classroom so much easier*

He also felt that the ease of having mobile furniture and white boards was very conducive to collaboration and class management. He utilized the white boards at times to create barriers between groups to help keep students on task.

The mobile red chairs were not perceived by the professor to be as effective as the tables were to collaboration. He felt that the red chairs did not let the students engage with each other as effectively as the other furnishings.

> *they can't even lean into each other well in those chairs and that I think it's an impediment. And it signals when kids sit in those chairs like I'm not here I'm not fully a member*

Other common ideas:

Professor 1 expressed the sense that *Airplay*, a wireless streaming protocol for Apple devices, was a big plus but brought up an issue of new technology being used in this space. Utilizing *iPads* to create content which then needed to be turned in for an assignment created an issue of how to collect those assignments. The *iPad* platform had no easy way to share the content with the instructor through *Blackboard* and they had to go from student to student and connect the *iPad* to their computer directly to copy the assignment for grading.

> *students had to turn in a* Garage Band *thing they wrote, I literally had to go around to 22 students with my laptop, plug in a cable and download it that way.*

Professor 1 also noted that having staff support in the next room was a benefit.

Professor 2 wondered if the things he felt were positive aspects to the space would be scalable to a larger classroom.

Professor 3 noted that the moveable podium was a positive feature of this space and he felt more part of the class by being able to position it out of the way more easily.

Future Directions

All three instructors in this study were advocates of this type of classroom and the methods implemented during the courses taught during the study. They used interactive pedagogy before teaching in this classroom and requested teaching in this space after learning of its existence.

It would be useful to conduct a similar study with instructors who might not have as favorable a view of this type of space to see how their opinion might or might not change after teaching in it for a semester.

To determine if smaller class size was a factor in how these professors perceived the space it would be valuable to study a larger learning space of this design with more students to determine whether the positive aspects would are scalable to larger classrooms.

Summary

Three instructor's perceptions of a learning space designed to be flexible and to support technology was explored in this study. Two things stand out from the interviews.

1) Instructors were able to implement more collaborative assignments and activities.
2) Communications between the instructors and their students were improved due to the room design.

Both of these were important to the instructors and were already part of their pedagogy. All three believed that the room allowed their approaches to be more effective than they had been in traditional lecture halls. While they liked what technology was used and that it worked well, they seemed more impacted by the layout and flexibility of the room itself together with its mobile furnishings. They all valued the ability to easily reconfigure the room, and that it was a very open and comfortable space for teaching and interacting with students.

All three instructors in this study clearly had a very positive perception of this classroom environment to the point of being fearful of not having access to a similar space in the future. Professor 1 successfully lobbied his department to create a similar classroom in its building because of the experiences he had in the specially designed space. The other two instructors are advocating to have spaces like this installed in their respective departments.

Since the instructors in this study were all comfortable using technology and were open if not eager to try new methods, it is difficult to know how other faculty who might not be as comfortable with these methods will react to this kind of teaching space. Professor 1 noted that, with new technology, there are faculty who don't even know what questions they need to ask about it.

> *a lot of times faculty don't even know what they want. They know what they want the outcome to be, but I know they don't know how to get there. … that's tricky to get that,*

Even Professor 3, comfortable with new technology and methods, started off a little unsure of what to do.

> *I loved this space immediately but I also wasn't sure if my pedagogy would be, would, would really take full advantage of it …*
> *I was afraid that I wouldn't make good enough use of it, um so once I sort of got in and was really thinking about the difference it was phenomenal.*

One of the goals of this study is to identify possible issues for instructors. This points out a potential problem for faculty who might be resistant to using a classroom of this kind and shows a possible way to deal with that uncertainty. They can see what was done before and that others worked through this very easily. This may ease any trepidation. Professor 3 pointed out that technology doesn't solve everything.

> *I think the technology it, it kind of showed me that it's not just the magic of the technology. That there is also an energy that I think has to originate in the instructor that there's got to be some give back too, to make it work"*

Even in a room that motivates the instructor, some instructional problems remained in spite of the flexible design and abundant technology.

Literature Cited

Barrow, L., Brock, T., & Rouse, C. E. (2013). Postsecondary Education in the United States: Introducing the Issue. *The Future of Children*, *23*(1), 3–16.

Beery, T. A., Shell, D., Gillespie, G., & Werdman, E. (2012). The impact of learning space on teaching behaviors. *Nurse Education in Practice*. doi:10.1016/j.nepr.2012.11.001

Beichner, R. J., & Saul, J. M. (2003). Introduction to the SCALE-UP (student-centered activities for large enrollment undergraduate programs) project. *Proceedings of the International School of Physics "'Enrico Fermi,'"Varenna, Italy. Http://www. Ncsu. Edu/per/scaleup. Html (accessed 7 June 2005)*. Retrieved from http://www.ncsu.edu/PER/Articles/Varenna_SCALEUP_Paper.pdf

Beichner, R. J., Saul, J. M., Abbott, D. S., Morse, J. J., Deardorff, D. L., Allain, R. J., … Risley, J. S. (2011). The Student-Centered Active Learning Environment for Undergraduate Programs (SCALE-UP) Project. In *Bulletin of the American Physical Society* (Vol. Volume 56, Number 2). American Physical Society. Retrieved from http://meetings.aps.org/link/BAPS.2011.NES.G1.1

Breslow, L. (2010). Wrestling with Pedagogical Change: The TEAL Initiative at MIT. *Change*, *42*(5), 23–29.

Cornell, P. (2002). The impact of changes in teaching and learning on furniture and the learning environment. *New Directions for Teaching and Learning*, *2002*(92), 33–42. doi:10.1002/tl.77

Douglass, J. A. (2010). HIGHER EDUCATION BUDGETS AND THE GLOBAL RECESSION: Tracking Varied National Responses and Their Consequences. Retrieved from http://escholarship.org/uc/item/44m4p8r4#page-10

Fagan, A. P., Crouch, C. H., & Mazur, E. (2002). Peer Instruction: Results from a Range of Classrooms. *The Physics Teacher*, *40*(4), 206. doi:10.1119/1.1474140

Hake, R. R. (1998). Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses. *American Journal of Physics*, *66*(1), 64. doi:10.1119/1.18809

King, G., & Sen, M. (2013). The Troubled Future of Colleges and Universities. *PS: Political Science & Politics*, *46*(01), 83–89. doi:10.1017/S1049096512001606

Lester, S. (2013, January 31). Liberalizing Cross-Border Trade in Higher Education: The Coming Revolution of Online Universities. *Cato Institute*. Text. Retrieved September 15, 2013, from http://www.cato.org/publications/policy-analysis/liberalizing-cross-border-trade-higher-education-coming-revolution

Martin, F. G. (2012). Will massive open online courses change how we teach? *Commun. ACM*, *55*(8), 26–28. doi:10.1145/2240236.2240246

Miller-Cochran, S., & Gierdowski, D. (2013). Making Peace with the Rising Costs of Writing Technologies: Flexible Classroom Design as a Sustainable Solution. *Computers and Composition*, *30*(1), 50–60. doi:10.1016/j.compcom.2012.12.002

National Center for Education Statistics. (2012). National Center for Education Statistics. Retrieved July 19, 2013, from http://nces.ed.gov/fastfacts/display.asp?id=74

Obeidat, A., & Al-Share, R. (2012). Quality Learning Environments: Design-Studio Classroom. *Asian Culture and History*, *4*(2), p165. doi:10.5539/ach.v4n2p165

Oblinger, D. (Ed.). (2006). *Learning Spaces*. Educause. Retrieved from www.educause.edu/learningspaces

Osborne, L., Franz, J. M., Savage, S. M., & Crowther, P. (2011). Dichotomy in the design studio : adapting to new blended learning environments. In *ICERI2011 Proceedings CD* (pp. 5579–5588). Madrid, Spain: IATED. Retrieved from http://www.iated.org/iceri2011/

Scott-Webber, L., Marini, M., & Abraham, J. (2000). Higher Education Classroom Fail to Meet Needs of Faculty and Students. *Journal of Interior Design*, *26*(2), 16–34. doi:10.1111/j.1939-1668.2000.tb00356.x

Taylor, S. S. (2009). Effects of Studio Space on Teaching and Learning: Preliminary Findings from Two Case Studies. *Innovative Higher Education*, *33*(4), 217–228. doi:10.1007/s10755-008-9079-7

Thompson, C. (2011, August). How Khan Academy is changing the rules of education. *Wired Magazine*, *19*(08). Retrieved from http://www.wired.com/magazine/2011/07/ff_khan/

Wilson, G., & Randall, M. (2010). Implementing and evaluating a “next generation learning space”: a pilot study. *Curriculum, Technology and Transformation for an Unknown Future: Proceedings of Ascilite 2010*, 1096–1100.

Zappe, S., Leicht, R., Messner, J., Litzinger, T., & Lee, H. W. (2009). (2009). Flipping" the classroom to explore active learning in a large undergraduate course. *American Society for Engineering Education.*

Zhu, E., Kaplan, M., Dershimer, R. C., & Bergom, I. (2011). USE OF LAPTOPS IN THE CLASSROOM: RESEARCH AND BEST PRACTICES. Center for Research on Learning and Teaching Occasional Paper No. 30.

Appendix A. IRB Approval

University of Nebraska Lincoln

August 15, 2012

Bradley Severa

Teaching, Learning and Teacher Education

116 ARCH, UNL, 68588-0104

David Brooks

Teaching, Learning and Teacher Education

123A HENZ, UNL, 68588-0355

IRB Number: 20120812840 EX

Project ID: 12840

Project Title: Graduate Thesis: Instructor Perceptions of a Collaborative Learning Classroom at a Midwest University

Dear Bradley:

This letter is to officially notify you of the certification of exemption of your project by the Institutional Review Board (IRB) for the Protection of Human Subjects. It is the Board's opinion that you have provided adequate safeguards for the rights and welfare of the participants in this study based on the information provided. Your proposal is in compliance with this institution's Federal Wide Assurance 00002258 and the DHHS Regulations for the Protection of Human Subjects (45 CFR 46) and has been classified as Exempt Category 2.

You are authorized to implement this study as of the Date of Exemption Determination: 08/15/2012.

1. The approved informed consent document has been uploaded to NUgrant (file with -Approved.pdf in the file name). Please use this document to distribute to participants. If you need to make changes to the informed consent form, please submit the revised document to the IRB for review and approval prior to using it.

We wish to remind you that the principal investigator is responsible for reporting to this Board any of the following events within 48 hours of the event:

* Any serious event (including on-site and off-site adverse events, injuries, side effects, deaths, or other problems) which in the opinion of the local investigator was unanticipated, involved risk to subjects or others, and was possibly related to the research procedures;

* Any serious accidental or unintentional change to the IRB-approved protocol that involves risk or has the potential to recur;

* Any publication in the literature, safety monitoring report, interim result or other finding that indicates an unexpected change to the risk/benefit ratio of the research;

* Any breach in confidentiality or compromise in data privacy related to the subject or others; or

* Any complaint of a subject that indicates an unanticipated risk or that cannot be resolved by the research staff.

This project should be conducted in full accordance with all applicable sections of the IRB Guidelines and you should notify the IRB immediately of any proposed changes that may affect the exempt status of your research project. You should report any unanticipated problems involving risks to the participants or others to the Board.

If you have any questions, please contact the IRB office at 472-6965.

Sincerely,

Becky R. Freeman

Becky R. Freeman, CIP

for the IRB

Appendix B. Photos

Photo 1

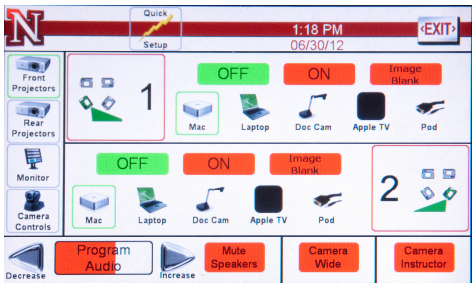

Photo 2

Photo 3

Photo 4

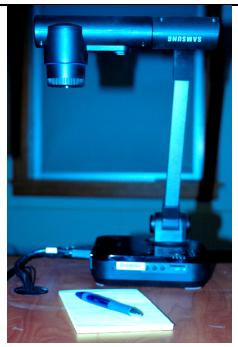

Photo 5

Photo 6

Photo 7

Photo 8

Photo 9

Photo 10

Photo 11

Photo 12

Photo 13

Photo 14

Photo 15

Photo 16

	
Photo 17	Photo 18
	
Photo 19	Photo 20