An epic teaching experience: A case study of pedagogically innovative undergraduate classrooms

Tiffany T. Runion
James Madison University

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An EPIC Teaching Experience: A Case Study of Pedagogically Innovative Undergraduate Classrooms

Tiffany T. Runion

A thesis submitted to the Graduate Faculty of JAMES MADISON UNIVERSITY

In Partial Fulfillment of the Requirements for the degree of Master’s of Science in Education

Adult Education/Human Resource Development

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FACULTY COMMITTEE:
Dr. Noorie Brantmeier, Committee Chair

Committee Members/ Readers:
Dr. Cara Meixner
Dr. Edward J. Brantmeier
Dedication

On May 9, 2015, I unexpectedly lost my mother. I considered taking a year off from this graduate school process, but ultimately decided to finish on time in spite of this immensely personal loss.

My mother was a nurse for almost 50 years in this community and in that time, she educated countless other medical professionals, patients and community members. She was always interested in what I learned in my classes and I often shared with her the details of my projects. This past year has been difficult on many levels, but one of the biggest has been not being able to share this research and work with her.

This work is dedicated to my mother, Janie Runion, who spent countless hours at the dining room table doing math homework with me by night, and untold hours working with her patients by day. She was the best teacher I ever had and is missed every day.
Acknowledgements

I would like to take this opportunity to thank my husband, Darrell Simpson, for his support during my graduate school career. From fixing dinners to proofreading papers, Darrell has always been my biggest supporter. I would not have been able to complete this degree without him. I would also like to thank my father, Harvey, my sister, Tracey, and my niece and nephew, Nikki and Hunter, and Darrell’s parents, Michael and Patricia, for their love and understanding when I had to say, “I can’t—I have to do homework” for the last three years.

I cannot help but feel lucky to have the opportunity to work with Dr. Noorie Brantmeier, my thesis committee chair. As my thesis committee chair, Noorie has given me a solid understanding of educational research and helped me work through my questions and problems related to this study. Noorie has talked me off of numerous thesis ledges, and for that I will always be grateful to her.

Megan Driver, the Assistant Director of Operations for the Student Success Center, deserves a special thank you for answering my questions and providing guidance and support throughout this process.

Lastly, I would like to thank my colleagues, Dr. Carol Hurney, Dr. Cara Meixner, Dr. Edward Brantmeier, and Tanya Laffler. Carol allowed me to adjust my work schedule to do this research (and complete my degree) while working full time. As part of my thesis review committee, Cara and Ed provided sound advice both on surviving graduate school and on the research surrounding the EPIC classrooms. Tanya was patient
and helpful despite the hours that I was out of the office and unavailable. This last year would not have been possible without the support and understanding of my colleagues.
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Abstract

This qualitative study examined seven professors who taught undergraduate classes in spring 2016 in the EPIC (Enhancing Pedagogy through Innovative Classrooms) spaces housed in the Student Success Center at James Madison University. The problem is that we do not know how instructors use the EPIC classrooms. In order to explore the pedagogical methods and classroom amenities used in these classrooms, I interviewed and observed seven instructors over a period of nine weeks. A collective case study methodology was used to describe the experiences of the instructors during this time period. My findings suggested that these instructors often used a combination of lecture and active learning pedagogies in conjunction with the flexible furniture, writable walls, and multiple projection points in the classrooms. Teaching in these spaces encouraged instructors to re-examine instructional strategies and led to individual professional development opportunities. Overcoming issues with technology in the classrooms was the most cited drawback of the EPIC classrooms. Future research should be conducted longitudinally, over a period of semesters or years, with instructors to fully determine the extent to which the instructors engage with the classroom environment, its amenities and the pedagogical choices of the instructor. Faculty development opportunities exist in the subjects of pedagogy and integration of technology in active learning classrooms.

Keywords: active learning, classroom design, classroom environment, classroom ecology, faculty development, experiential learning theory and constructivism
Chapter 1: Introduction

In 2013, Gallup reported that seven out of 10 Americans viewed a college education as “very important” (http://www.gallup.com/poll/166490/americans-college-education-important.aspx). With more Americans viewing a college education as an important step to achieving the American Dream, institutions of higher education are under more pressure than ever to ensure that graduates have the skills necessary to compete in an increasingly global world. This pressure, coupled with tuition hikes for both public and private institutions, and the ever present option for fully online courses from other institutions, has forced brick and mortar colleges and universities to reconsider the strategies used to educate students.

Traditional brick and mortar institutions have similar characteristics including: a residential student body; a recognized geographic area where most students come from; full time faculty members who teach develop curricula; teach students in traditional classroom settings; engage in research and scholarship relevant to their discipline; the institution houses a library and physical plant; the institution has a non-profit financial status and the organizational effectiveness is measured according to fields such as: instruction; funding; faculty/student ratios; and faculty/student qualifications (Hanna, D.E., 1998). These characteristics originated during the industrial revolution and were not seriously challenged until the late 1990’s when new technologies made it possible to engage in distance learning—a previously unconceived prospect (Hanna, D.E., 1998). Student learning in higher education evolved from the traditional lecture based course in an auditorium style classroom to courses taught in innovative spaces, online
environments or in blended learning hybrid environments. In addition to these modern learning environments, an evolution of teaching styles took place—from the traditional lecture based courses to courses that encourage collaboration, teamwork, experiential assignments, and active engagement with the course material. Institutions are expected to teach students information from a specific discipline, and foster learning skills in communication with others and critical thinking (Chism, 2006). This shift in teaching style—from lecture based to active learning—encourages learning that is more student focused and less instructor driven.

My undergraduate experience was different from the experiences of today’s undergraduates. I attended a small undergraduate liberal education college in Virginia in the late 1990’s. As a first generation college student, my perception of college was informed by anecdotes from high school teachers and television/movies. I knew that I would go to class, listen to lectures, take copious notes, write research papers, and eventually receive a degree for all of my hard work. During my four years of school, learning was instructor focused and led through lectures; technology appeared in some classrooms in the form of overhead projectors, televisions and VCRs, and some computer/projectors in larger classrooms that displayed Power Point slides. Student learning was assessed through written papers and exams.

Fast forward to 2012 when I enrolled in graduate school at James Madison University. In addition to my anxieties about being a non-traditional student and interacting with the other students, I realized that teaching and learning styles were significantly different from my previous experience. I could no longer sit in my seat, take notes, write papers, and complete exams. I was actively engaged with the material, the instructor, and the
other students, and supposedly, all of this interaction enhanced my learning. In the twelve years between finishing my undergraduate degree and starting my graduate degree, whiteboards replaced chalkboards, everyone brought at least one electronic device to class, and typically it was perfectly acceptable (and expected) to use an electronic device to look up information to contribute to a class discussion. I experienced group projects and presentations in every class, and the disorienting experiences of wearing camouflage face paint and teaching my classmates how to use a duck call. Did these collaborations, presentations, and face paint teach me anything? The answer is yes. I was pushed outside of my comfort zone and encouraged to make deep connections with the course content and my fellow classmates.

The last two and a half years transformed my perceptions of teaching and learning and showed me the importance of engaging with course content and applying knowledge in practical situations. My experiences as a passive learner in the late 1990’s and as an active learner over the last three years caused me to consider differences in teaching styles and environments and as a result pursued this research on learning spaces and instructional strategies.

In 2014, James Madison University opened the Student Success Center—a building that houses 20 university departments and provides “collaborative, high-impact environments to support student learning, student health, and student services” (https://www.jmu.edu/successcenter/facility/advertising.shtml). In addition to student services, common study spaces, and eating areas, the building includes eight EPIC (Enhancing Pedagogy through Innovative Classrooms) classrooms, featuring “wall-to-wall writable whiteboard surfaces, multiple projection points, movable teaching stations
and flexible furniture” (http://www.jmu.edu/epic/index.shtml). These innovative pedagogical options offer professors the opportunity to teach with flexible, active learning techniques in spaces that differ from a traditional classroom.

I became aware of the EPIC classrooms through my full time job at JMU and began to wonder what was happening in these classrooms that was so different than the “typical” classrooms on campus. My research explored the uses of the amenities in the classrooms and the pedagogies used in conjunction with the amenities. Now, I will explain the problem that my research aims to identify.

**Statement of the Problem**

We lack understanding of how instructors use the EPIC learning spaces and what types of instructional strategies are utilized in those spaces. As the demand for deeper learning experiences grows in the field of higher education, so does the ability to discover unique ways to innovate in the classroom. Educational researchers have the opportunity to explore a new frontier—the physical classroom space and the way that teaching occurs in those spaces. The case studies enumerated in this research show the journeys of seven instructors teaching in the EPIC classrooms in spring 2016. Now, I will explain the purpose of this study.

**Purpose of the Study**

The purpose of this study is to explore the ways that instructors use innovative classroom spaces and how this use contributes to their professional development. This research will contribute to the body of literature surrounding physical classroom design. I hope that this research will reveal the impact of physical classroom space on
instructional strategies and contribute to the existing research on innovative classroom design.

**Research Questions**

This study seeks to answer the following questions involving physical classroom space and instructional strategies.

- What physical amenities are most often used in the EPIC classrooms?
- What instructional strategies are used in the EPIC classrooms?
- Why do instructors choose to teach in EPIC spaces?
- How has teaching in the EPIC classrooms impacted the instructors’ professional development?

A description of the EPIC classrooms utilized in the study as well as the way that the instructors interacted with the classroom space and the pedagogies that were used is detailed below in subsequent chapters. Now, I will discuss my assumptions, the limitations, and the scope of this research.

**Assumptions, Limitations and Scope**

Below, I have identified the assumptions, limitations, and the scope of this study.

**Assumptions.** I believe that the teaching strategies used in the EPIC classrooms will encourage more interaction between the instructor and students and among the students than is possible in a traditional classroom. Given the flexibility of the furniture, I envision students moving between seats and around different areas of the classroom, the instructor moving among groups of students and individuals with greater ease than in a traditional classroom setting, and the instructor taking advantage of the opportunity to
Teach from different areas in the classroom. Additionally, I believe that the technology in the classroom will afford the instructor and the students the opportunity to utilize a variety of media during the instructional time, including multiple projection screens, cameras, audio recording capabilities, and writable walls.

Teaching in active learning spaces provides a professional development opportunity for instructors as they experiment with the physical classroom space and the pedagogies used within those spaces.

**Limitations of the study.** I identified several limitations in this study.

*Weather and timing.* This research was conducted in the latter half of the 2015 academic year and the early part of the 2016 academic year. Winter weather affected the interview and observation schedules in late January. One interview and one observation were postponed and rescheduled due to the university’s inclement weather policy. In February, additional observations were affected by snow and ice. Additional timing factors included one professor who was on medical leave for the first three weeks of the semester and one instructor who unexpectedly cancelled class due to illness. The weather and medical issues affected the intended timeline of the interviews and observations. Due to the time constraints, two research subjects were observed one time instead of the intended two times.

*Range of teaching experience.* In addition to the small sample size, the research subjects represented a range of a range of experience—both in overall years of teaching and in number of semesters taught in the EPIC classrooms. Initially, I wanted a sample population of professors with prior experience in the EPIC classroom; however,
the response rate to my survey requesting participants necessitated that I allow for novice as well as experienced EPIC instructors.

**Observer effect and bias.** The effect of me, as an observer, for this study was apparent in two separate scenarios. First, when scheduling the in-class observations, participants 002, 003, and 004 consulted the class syllabi to find “interesting” class times for me to observe. Second, several of the research subjects introduced me to their classes. Subject 005 commented to the class that s/he was more “self-conscious with an observer in the room” and subject 002 asked me to comment to his/her class on my experiences with qualitative research.

As an observer, I am aware of the biases that I bring to this research. As an undergraduate liberal arts student in the late 1990’s, I experienced classes that were almost solely lecture based. The technology used in my undergraduate classes was limited to overhead projectors, TV’s and VCR’s and the occasional PowerPoint presentation from a desktop computer. Students did not carry electronic devices to class—there were no cell phones or laptops in use. I prefer—and am most comfortable—learning material in a traditional classroom environment where the instructor is stationed at the front of the room and students are seated in separate desks. The technologies available in the EPIC classrooms are a bit disorienting to me and I am interested to see how the research participants incorporate the technology in their classes for meaningful instructional experiences.

The second bias that I recognize about myself is that I am unsure what enhancements the physical space can bring to an instructor who is already using active learning
strategies in the classroom. It seems that an instructor who is able to think “outside of the box” would be able to experiment with instructional strategies in any physical space.

*Lack of interviews with key informants.* I should have included interviews members of multiple key informants—namely members of the EPIC steering committee to incorporate with Megan Driver’s background information.

*Scope of the study.* This study utilized a qualitative approach and relied on data captured through interviews and in class observations; therefore the scope of the research was confined to instructors teaching in the EPIC classrooms who agreed to be interviewed and observed for this research study. Forty instructors were surveyed near the end of the fall 2015 semester to assess their willingness to participate in this research. Of the forty instructors, nine people responded to the survey. Of the nine, seven were chosen to participate in this study. The seven were chosen based on the following parameters:

- Willingness to be interviewed and observed during two class sessions.
- Currently teaching an undergraduate course in an EPIC classroom in the spring 2016 semester.

Now that I have discussed the assumptions, limitations, and scope of this study, I will explain the significance of this research and outline the gap in the existing research on innovative classroom spaces.

**Significance**

The significance of this study is listed below with regard to knowledge generation, professional application and social change.
**Knowledge generation.** The study of innovative spaces and the teaching strategies utilized in these spaces has the potential to inform future classroom design initiatives and to further educational research and scholarly contributions regarding innovative classroom space and instructional strategies. While there are volumes of scholarly literature on instructional strategies in higher education, there are few studies that consider how the physical classroom space impacts the instructional strategies that are utilized in the classroom environment.

In 2007, Temple conducted a literature review concerned specifically with learning spaces. In his executive summary, Temple argues that most of the existing literature focuses on space planning or building design and that there is a limited amount of literature that focuses on space related to teaching and learning in higher education. Brooks identified in 2011, that few empirical research studies had been conducted regarding the effects of classroom space on student learning. Since 2011, additional research has been conducted on physical learning environments, but there is still not a significant body of scholarly literature on the subject.

**Professional application and social change.** In their seminal work, *21st Century Skills: Learning for Life in Our Times*, Trilling and Fadel (2009) discussed a skills gap in recent college graduates in topics such as: oral and written communications; critical thinking and problem solving; professionalism and work ethic; teamwork and collaboration; working in diverse teams; applying technology and leadership and project management. The Framework for 21st Century Learning (2002) suggests that the following competencies are necessary for success in the 21st century: core subjects and 21st century themes; learning and innovation skills; information and technology skills;
and life and career skills. Marks (2013) argues that core subject information will always be important in education, but that 21st century themes like “global awareness, health literacy, and financial literacy” (p. 36) must be included with core subjects in order to fulfill a need for deeper, more engaged learning experiences. Active learning in innovative classrooms have the power to create significant social change in higher education by encouraging the synthesis of core subjects with complex skills through student and faculty interaction (Bowen, 2012) with activities such as collaboration, communication, critical thinking, creativity, and problem solving (Marks, 2013).

This research has the potential to contribute to changes in the way that instruction occurs in active learning classrooms (ALC). First, this study may inform future instructor’s design and delivery of content in an ALC. Second, this research also has the ability to impact future decisions on classroom design in new architectural endeavors and in existing classroom remodeling both at James Madison University and other higher education institutions. Finally, this research suggests that faculty developers can provide support to instructors teaching in active learning classrooms through strategies such as workshops, mentoring relationships, consultations and classroom observations.

**Key Term Definitions**

In Table 1 below, the terms used throughout this research are defined. Keywords that are utilized for this study include: active learning, classroom design, integrated course design, faculty resistance, and instructional strategies.

Table 1

*Key Terms and Definitions*
<table>
<thead>
<tr>
<th>Key Term</th>
<th>Definition</th>
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<tr>
<td><strong>active learning</strong></td>
<td>Learning that provides students with the opportunity to be engaged with the material through reading, writing, discussions, case study activities and case study activities. Students are involved in higher order thinking such as analysis, synthesis and evaluation. Learning that provides students with (Myers &amp; Jones, 1993 and Bonswell &amp; Eison, 1991)</td>
</tr>
<tr>
<td><strong>classroom design</strong></td>
<td>Considerations for classroom design include “size and shape, furniture and seating arrangement, modern technology arrangement, interior lighting, color selection, thermal condition, and noise level” (Lei, 2010).</td>
</tr>
<tr>
<td><strong>integrated course design</strong></td>
<td>“The basic idea behind ICD is that, rather than simply develop a list of topics in a course and then provide students with lots of information about each topic, we need to design our courses in a way that is learning-centered, systematic, and integrated. If we can do this, students will respond by becoming more engaged in the work of learning and will succeed in achieving more important kinds of learning.” (Fink, 2007, p. 13)</td>
</tr>
<tr>
<td><strong>instructional strategies</strong></td>
<td>Consist of a series of decisions and plans and a variety of related teaching activities that are aimed at achieving intended outcomes (Dick, Carey, &amp; Carey, 2001)</td>
</tr>
<tr>
<td><strong>experiential learning</strong></td>
<td>“The process whereby knowledge is created through the transformation of experience” (Kolb, 1984 p. 41).</td>
</tr>
<tr>
<td><strong>constructivism</strong></td>
<td>People are active learners and create knowledge for themselves through the manipulation of content and social interaction.</td>
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</table>

In the second chapter, I will discuss Kolb’s experiential learning theory and constructivism, as the theories that shaped this research, provide a review of literature on the subjects of classroom design and technology, instructional strategies, and faculty development. The subsequent chapters of this study will discuss my methodological approaches to the research, analysis of the data, findings of this study and implications for future research.
Chapter 2: Literature Review

Several sources were consulted in order to find literature concerning classroom design, instructional strategies, and technology use in the classroom. First, keyword searches were done through the James Madison University libraries to identify scholarly articles. The ERIC and EBSCO combined databases are often used to locate scholarly sources and I focused first in the subject area of education and second, in the subject area of psychology. Google Scholar was consulted as a secondary database when articles were not available within the James Madison University library system. Keywords that were used in searches include: “active learning”, “classroom design and higher education”, “classroom organization and higher education” “innovative classroom and higher education”, “innovative classroom”, “pedagogy and classroom technology”, “experiential learning”, “experiential learning and faculty development”, and “faculty attributes.” These searches informed the creation of the categories below on classroom design and technology, instructional strategies and faculty development.

Conceptual Framework and Theoretical Framework

The conceptual framework below shows the intersection between instructional strategies, classroom design and technology, faculty development, experiential learning theory and constructivism:
**Figure 1.** Conceptual framework showing how innovation in active learning classrooms is dependent on classroom design and technology, instructional strategies, experiential learning theory and constructivism.

**Learning theories.** Experiential learning theory and constructivism are applicable to the instruction that occurs in active learning classrooms and to the professional development of those instructors. Instructors who teach in these classrooms have the opportunity to experiment with new pedagogical approaches, integrate those approaches into their teaching styles, re-evaluate the way that they present content and re-consider their approach to in-class activities. I believe that the ability to experiment with pedagogies and the classroom environment may lead the instructors to construct new ways of teaching content that will be applicable to classes regardless of whether or not they are taught in the EPIC classrooms. Below, I provide an explanation of Kolb’s experiential learning theory and constructivism.

**Experiential learning theory.** Kolb (1984) defined experiential learning as “the process whereby knowledge is created through the transformation of experience” (p. 41). In 2014, Kolb published a second edition of his seminal work, *Experiential*
Learning: Experience as the Source of Learning and Development, which provided a complete history of experiential learning theory including background on the pillars of experiential learning to include: educational philosopher John Dewey, social psychologist Kurt Lewin, and developmental psychologist Jean Piaget.

Experiential learning theory (ELT) proposes that the way an individual learns shapes that individual’s development. These learning preferences are influenced by “personality type, specialized education, current job role and tasks” (Kolb & Kolb, 2005 p.4). Two processes exist for grasping information (concrete experience and abstract conceptualization) and two processes for transforming experiences into learning (active experimentation and reflective observation (Buch and Bartley, 2002). The following table is a summary of the four learning styles and learning processes identified by Kolb (1999).
### Table 2

**Kolb’s Learning Styles and Processes**

<table>
<thead>
<tr>
<th>Learning Style</th>
<th>Dominant Learning Abilities</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diverging Style</td>
<td>Concrete experience</td>
<td>View concrete situations from many points of view; performs well in brainstorming sessions, interested in people; imaginative, emotional, broad cultural interests and specializes in the arts; prefers group work; is open minded and receptive to feedback.</td>
</tr>
<tr>
<td></td>
<td>Reflective observation</td>
<td></td>
</tr>
<tr>
<td>Assimilating Style</td>
<td>Abstract Conceptualization</td>
<td>Understands and organizes range of information succinctly and logically. Interest in ideas and abstract concepts. Important for effectiveness in scientific careers. Formal learning preferences: readings, lectures, exploring analytical models, and having time to think concepts through.</td>
</tr>
<tr>
<td></td>
<td>Reflective Observation</td>
<td></td>
</tr>
<tr>
<td>Converging Style</td>
<td>Abstract Conceptualization</td>
<td>Finds practical uses for ideas and theories. Solves problems. Prefers technical tasks to social and interpersonal issues. Skills are important for effectiveness in specialist and technology careers. Prefers to experiment with new ideas, simulations, laboratory assignments, and practical applications.</td>
</tr>
<tr>
<td></td>
<td>Active Experimentation</td>
<td></td>
</tr>
<tr>
<td>Accommodating Style</td>
<td>Concrete Experience</td>
<td>Learns from hands on experiences. Enjoy new and challenging experiences. Rely on others for information rather than technical analysis. Effective for action oriented careers; prefer to work with others.</td>
</tr>
<tr>
<td></td>
<td>Active Experimentation</td>
<td></td>
</tr>
</tbody>
</table>

These learning preferences are affected by environmental factors such as educational specialization, professional career, current jobs and adaptive competencies. Educational specialization has a profound effect on the development of learning preference. Typically, most elementary instruction is generalized; however, as students move into secondary and post-secondary education, individuals are exposed to certain types of learning which results in “particular relations between learning styles and early training in an educational…discipline” (Kolb & Kolb, 2005 p. 6). Some correlations can be drawn between academic discipline and learning preference. For instance, those with an educational background in subjects such as English and psychology tend toward the diverging learning style, while individuals with backgrounds in education and
communications may have a preference for accommodating styles (Kolb & Kolb, 2005).
It is therefore reasonable to assume that an instructor teaches students based on the
instructor’s own preferred learning preferences and the way that the instructor learned
material during his/her time as a student.

Regardless of an individual instructor’s personal learning style, each instructor has the
opportunity to re-conceptualize certain parts of the course content to be taught in the
EPIC classroom and then experiment with new ways of content delivery and in-class
activities. These experiments may have a long-term impact on the instructor’s
pedagogical choices that will last well beyond the EPIC classroom. Kolb discussed
learning preferences in great detail as they relate to his experiential learning theory.
Other educational researchers argue that there is not a sound body of literature to suggest
that learners may in fact have learning preferences—preferred ways of engaging with
materials, but that these preferences should not limit the way that a person learns (Pasher,

There are five contemporary applications to experiential learning theory: social policy
and action, competence based education, lifelong learning and career development,
experiential education, and curriculum development (Kolb, 2014). Lifelong learning and
career development and experiential education are the applications that are most
applicable to this study. For most academics, careers encompass three main aspects:
instruction, scholarship, and service. Experiential learning theory is directly applicable to
an individual’s professional development as an instructor. This professional development
can come about when an instructor develops learning strategies and/or teaches in an
environment that differs from the instructor’s own academic experiences. Kolb and Kolb
(2005) identified several studies that suggest a tension can exist between the instructor’s personal learning style and students’ learning styles. When the learning environment is incongruent with the learners’ preferred styles of learning, learning is more easily resisted or rejected entirely (Buch & Bartley, 2002).

I posit that when the instructor is pushed outside of their instructional comfort zone and given a new environment in which to teach, they are more likely to discover new content delivery strategies and activities that differ from the strategies and activities used in a more traditional classroom environment. Although Buch and Bartley’s (2002) research was limited to the corporate sector, the implications of the study are applicable to professional development in higher education as well. Buch and Bartley (2002) suggest that additional training for the instructors is necessary--training that addresses various learning preferences and environments in order for instructors to step outside of their own comfort zones and provide learning opportunities based on their students’ learning preferences and the specific subject matter.

In addition to learning styles, Kolb also highlights the importance of the learning space. Kolb (2014) identifies the physical learning environment (a space most typically thought of as a classroom) as a learning space, but takes the concept several steps further and goes on to identify other types of learning spaces:
The five types of learning spaces identified above inform an instructor’s teaching style. Consciously or unconsciously, these learning spaces may impact the development of an instructor’s ideas on teaching and learning and how to best provide students with necessary information.

Experimenting with innovative classroom spaces, technologies, and pedagogical approaches may lead the instructor to construct new ways of knowledge transference from instructor to student.

**Constructivist learning theory.** Dialectical constructivism posits that knowledge is created through interactions between people and their environments. Schunk (2012) argued that dialectal constructivism is useful in research “aimed at exploring the effectiveness of social influences such as exposure to models and peer collaboration (p. 233).

Lev Vygotsky is considered an authority on sociocultural constructivism which places emphasis on the “social environment as a facilitator of development and learning” (Schunk, 2012, p. 241; Tudge & Scrimsher, 2003). The key underpinnings of the constructivist learning theory include:
• Learning occurs with cognitively active learners.

• Learning happens in context and is structured around themes and primary concepts.

• New knowledge is built upon prior knowledge.

• New knowledge is applied and feedback is provided.

(Brooks & Brooks, 1999).

Overall, constructivists believe that learners create their own meaning through reflection and discussion with others. New information is subjective and comes from the individual’s experiences and the experiences of others (Svinicki, 2004).

Chism (2006) states that learning which involves acknowledging the importance of existing knowledge, fitting that knowledge into an existing schema or creating a new schema and actively processing, or applying, the information all are important facets of the higher education environment. These facets of the higher education environment connect closely to constructivism—where new knowledge is built upon prior knowledge and past experiences. In higher education, instructors have the ability to reinvent their teaching strategies through integrating the instructional knowledge they already possess with re-conceptualizing traditional teaching strategies.

The concepts of innovative classroom spaces, the ability to experiment with different pedagogical approaches and activities, and the ability to construct new knowledge with regard to teaching approaches leads to the professional development of the instructor which can then be further nurtured through structured faculty development opportunities. That iterative process is shown below:
Figure 3. Iterative process of working in an innovative space, experiential learning theory, constructivism, and professional development.

Through experimentation with the active learning classroom environment, instructors re-conceptualize instructional strategies and activities thereby creating new approaches to teaching content. This process calls upon facets of experiential learning theory and constructivism.

The review of the literature for this study is organized thematically below. The themes identified are: classroom design, instructional strategies, and faculty development.


Classroom Design

The typical university learning environment evolved from industrialized approaches to education where classrooms spaces are designed as lectures theatres and seminar classrooms. The paradigm of learning in the industrial era consisted of passive and directed learning contexts with technology available only to the instructor; where individuals learn alone and knowledge is imparted on students by an instructor (Cornell, 2002). Cotterill’s introduction to his theoretical research (2015) points out that even the title of “lecturer” (p. 404) assumes that the primary duty is lecturing in traditional classrooms. Architecturally, these classrooms are described as “seminar”, “classroom with loose seating”, “larger classroom with fixed seating”, and “auditorium” (Folkins, Friberg and Cessarini, 2015, p.45).

Traditional classrooms are configured with a “front” to the classroom where, typically, a whiteboard, projector screen, and instructor station (including a computer) are situated. In large classrooms, student desks may be arranged in a “lecture” style with long rows of desks set facing forward to accommodate large numbers of students. Due to the number of desks in the classroom, rearranging the furniture may be inconvenient or impossible (if seats are bolted to the floor) discouraging collaboration among students or close interactions with the instructor. In a traditional classroom, the distance—or even perceived distance of the instructor from the students may have a negative impact on student learning (Folkins et al 2015; Cotner, Loper, Walker, & Brooks 2013).
Figure 4. Example of photograph to show configuration of classroom without students or professor present in the photo. Retrieved from:
http://upload.wikimedia.org/wikipedia/commons/0/0e/Dickinson_College_18_College_classroom.jpg

Cornell (2002) described a shift in the paradigm of teaching and learning from the industrial era to the “knowledge era” (p. 34), which he described as having the following characteristics: active learning, facilitated learning, ubiquitous technology, learning occurs alone and together and is both planned and chaotic. To accentuate these characteristics of active learning, several scholars identified elements that are considered optimal for a classroom that promotes active learning.

Babey (1991) produced qualitative data from a 1988 survey of faculty and students at the University of California-Davis that concluded faculty members wanted classrooms that were “bright, spacious, large, natural, organized, harmonious, comfortable, airy, functional, inviting, happy, interesting, and beautiful” (p. 10). Other scholars describe active learning classrooms in the following ways: empower faculty, emphasize flexibility, encourage student interaction, stress simplicity, expand connectivity, contain costs and sweat the details (Niemeyer, 2003); a flat space with flexible seating that is easily
changed for large or small groups (Brooks, 2012); and flexible seating, space for the instructor to move, space for groups of students to report out to the class, clear focal point in the room with good sight lines, good acoustics, easy access in and out of the classroom, spaces for students to congregate before and after class, zoned and adjustable lighting, and windows that add “interest, character, and style” (Folkins et al. 2015, p. 59). Of these four descriptions, themes emerged around flexible seating, space for interactions and movement, and comfort (in seating, lighting and temperature) and bright spaces with windows.

The integration of technology in active learning classrooms is a common expectation. Features commonly adopted in modern learning environments include: ubiquitous wireless connectivity and group and collaborative tools (Oblinger, 2006). Cornell (2002) described the concept of “user-centered design” (p. 36) where the needs of the user are the driving force behind the design of the classroom. User-centered design goes a step beyond four classroom walls and should incorporate furniture and technology in order to support the active learning paradigm. The capabilities include: “fold-n-go” where instructors and students can easily reconfigure rooms and “plug-n-play” is the ability for technology needs to be accessed by students as well as instructors. This included power and data connections in well-positioned locations (not just on the walls) throughout the classroom. “See-n-see” is a concept wherein instructors and students are able to “present, modify, record and retrieve” information within the classroom (p. 37), “relate-n-reflect” the environment should support collaboration and individual work spaces, “inspire-n-invite” is the concept that encourages motivation to learn in an environment that is “fun, energetic, and enjoyable” (p. 37).
Gebre, Saroyan and Aulls (2015) found that instructors who viewed effective teaching as “transmitting knowledge” (p. 217) used the technology available in active learning classrooms primarily as presentation tools. In contrast, instructors who viewed effective teaching as “developing student’ learning independence/self-reliance” (p. 217) viewed the technology in the room as “essential tools” (p. 217) for student learning.

Lippincott (2009) argued that certain assumptions exist regarding the update of classroom spaces and the integration of technology in these spaces: what classrooms should look like—either based on current classroom layout or a change model; faculty readiness to change their current teaching styles and how technology may be integrated into new teaching styles; and the role(s) that technology may play in student learning. In order to fully investigate these assumptions, administrators and facility planners should involve faculty in the design of innovative classroom spaces to ensure the design fully captures elements that faculty desire. By involving faculty in the design process, “the learning needs of the discipline drive the planning processes” (Lippincott, p. 18). Finding the intersection of the curriculum, pedagogical activities and the classroom design pays off for both the students and the faculty using the classroom.

Petersen and Gorman (2014) acknowledged some of the challenges with active learning classrooms and proposed recommendations for overcoming those challenges.

**No focal point in the classroom.** The modification of the classroom design to an active learning environment removed the focal point of the classroom from the front of the room. In fact, some may argue that a “front” of the room no longer exists in an active learning classroom. Because of this, some students may not always face the instructor or a projector screen. Students may need to turn or move their chairs in order to see the
instructor or the projector screen. Additionally, students may not be able to take notes from a desktop surface.

**Multiple distractions.** Distractions take multiple forms in active learning classrooms. Some of the distractions identified by Petersen and Gorman (2014) are students distracted by multiple electronic devices in use in the classroom at the same time, students not knowing what projector screen or wall they are supposed to be paying attention to, and long delays in distributing and collecting work from students.

**Overwhelming technology.** Instructors shared a range of feelings from anxiety of not knowing how to use the available technology in the classroom, to pressure to use all of the technology types in the room (Petersen and Gorman, 2014). The technology available to instructors in the EPIC classrooms, for instance, includes: ubiquitous wireless connectivity, multiple projection sites throughout the classroom (with the ability to display different images on different screens at the same time), Apple TV/Air Play, video and audio recording capabilities, projection cameras, electrical outlets in the floor, and the ability to plug in differing electronic devices to the system in the room. This last option gives an instructor the ability to plug his/her own device (or a student’s) into the room’s system.

Notable projects that consider classroom design as an integral part of the active learning classroom include the Technology Enabled Active Learning (TEAL) at Massachusetts Institute of Technology, the Student-Centered Active Learning Environment for Undergraduate Programs (SCALE-UP) at North Carolina State
University, and the Active Learning Classroom (ALC) at the University of Minnesota and McGill University.

**Instructional Strategies**

Historically, the knowledge transfer between professor and students occurred when the instructor stood at the front of the room and lectured while students took notes with paper and pen. In recent years, the effectiveness of lecture as a primary mode of teaching has been questioned and active learning strategies have infiltrated the college classroom.

If other higher education providers, such as fully online programs and massive open online courses (MOOCS) are able to provide a quality education in the way that students want, at a greater convenience to the student and a lower cost, the enrollment of traditional universities will begin to suffer. Newman, Courturier, and Seurey, (2004) identified four forces driving the change in the way that institutions of higher education do business:

- Information technology—technology offers the ability to teach courses and entire curricula online;
- Emergence of new types of educational services—corporate organizations and for-profit educational institutions are more prolific now and offer certificate programs as well as traditional degree programs;
- Globalization of higher education—institutions in the United States and worldwide are offering their courses to the global community;
• New types of students—older students, minority students, and first generation students. Additionally, traditional students have a greater knowledge of technology and competing activities (part-time jobs, family commitments)

As a result of these and other forces impacting higher education, educators began to see a paradigm shift --from lecture based teaching to active and experiential learning. Some of the active learning concepts to emerge have been: active learning, writing to learn, understanding how students learn, small group learning, assessment as learning, service learning, reflecting on one’s own teaching or learning, and the use of instructional technology (Fink, 2013). Myers and Jones’ (1993) argued that active learning techniques responded to differing types of college students in the classroom today. Additionally, the classroom has taken on a global face with students from different backgrounds and cultures coming together in learning environments (Myers & Jones, 1993). Given the varied experiences, cultures, and backgrounds of students in the classroom, instructors should allow students to bring their unique perspectives to the classroom and employ tactics to encourage students to actively engage with the course material in a variety of ways.

Fink (2007, 2009) wrote extensively on creating significant learning experiences through integrated course design (ICD). These significant learning experiences involve active learning strategies and that promote students’ application, synthesis and evaluation of content. Figure 5 below represents Fink’s taxonomy of significant learning, which articulates the types of significant learning outcomes to be cultivated in a course:
Fink argues that by using ICD (2007, 2009) professors can foster each of the six types of significant learning outcomes addressed by his taxonomy. He defines ICD as follows:

The basic idea behind ICD is that, rather than simply develop a list of topics in a course and then provide students with lots of information about each topic, we need to design our courses in a way that is learning-centered, systematic, and integrated. If we can do this, students will respond by becoming more engaged in the work of learning and will succeed in achieving more important kinds of learning. (Fink, 2007, p. 13)

Fink’s model of integrated course design is shown below in Figure 6.
Figure 6. Fink’s model of integrated course design (2007). This model shows that situational factors are the underpinnings to creating learning goals, teaching and learning activities, and feedback and assessment.

From Fink’s model, it is possible to see the importance of the consideration of situational factors and their interplay with teaching and learning activities, learning goals, and feedback and assessment. Fink’s situational factors (2007, 2009) include “specific context, expectation of others, nature of the subject, and nature of the students” (2007, p.14). When designing a course, professors must consider the number of students and how the course will be delivered—in person, online, or hybrid. After answering questions specific to situational factors, the course designer must identify what content that students are to learn. This content ties back to Fink’s taxonomy of significant learning. After determining the learning goals for the course, the course designer must decide on teaching and learning activities (Fink, 2007). Fink merges the principles of active learning into a model that he calls “Model of Holistic Active Learning” (Fink, 2007 p. 14). The model describes three concepts that should be incorporated not only into the course as a whole, but also the major sections of the course: “acquiring the
necessary information and ideas” (Fink, 2007, p. 15) from readings or lectures, “having an observing or doing experience” (Fink, 2007, p. 15) by reviewing case studies, completing hands on exercises or learning about the similar experience of others, and “reflecting” (Fink, 2007, p.15) on the information through papers or journaling. Each part of Fink’s model of integrated course design relies on the other parts of the model. Therefore, the situational factors, including the classroom environment and amenities available, impact the teaching and learning activities chosen, the learning goals and feedback and assessment of leaning.

Now, I will discuss some of the common instructional strategies that I noted during the interviews and observations for this study.

**Lecture.** When one conjures up an image of the typical university classroom, the image is likely close to Figure 7 below:

![Lecture based classroom](http://www.fctl.ucf.edu/TeachingAndLearningResources/LearningEnvironments/largeclass.php)

In this image, we see a large number of students in an auditorium style classroom set up. There is one large screen at the front of the room. The instructor is likely also at the front of the room, and may need a microphone for all of the students to hear the lecture. The seats in this style classroom do not move and therefore do not encourage active engagement between students seated in close proximity to one another. The distance between the instructor and the students in the room makes personal interaction between the instructor and students virtually impossible.

Bonswell and Eison (1991) wrote that lecture does have desirable characteristics and that an “enthusiastic” (p.7) lecturer is capable of communicating “intrinsic interest of the subject matter, providing students with a “scholarly role model”, describe subject matter that is not available in other sources (e.g. original research), organize material in a way that meets the “particular needs” of the audience, and efficiently deliver large amounts of information” (p.7). Lectures are also a cost effective way to reach large numbers of students and does not require active participation by students, which may be advantageous to more introverted students (Bonswell & Eison, 1991).

Bowen (2012) argued that, when faced with attending a lecture in class, students have a variety of options to explore. They look for lectures on the topic on iTunesU, listen to a lecture from another instructor at another university online, or ask a classmate to record and/or livestream the lecture. Given the multiple options students have to learn the subject matter it is imperative that, when used, lecture provides added value to the students. Bowen (2012) suggests several ways to add value to lectures including using motivation to inspire deep thinking on a topic, showing yourself to students as a good role model in the areas of “intellectual, personal, and moral values” (p. 188) and helping
students to make connections and examine assumptions or questions that students may have from the reading.

In contrast, Fink (2013, p.4) argued that lecture has limited effectiveness to:

- enable students to retain course information;
- develop the ability to apply knowledge to new situations;
- develop skills in thinking and problem solving; and
- achieve affective outcomes such as motivation to continue learning or shift in attitude.

Fink (2013) reviewed multiple studies and concluded that students do not retain information very well and reported no significant difference in learning between students who take a course and students who do not. Fink’s assertions point to the fact that lecture based learning may not be the most effective type of instructional strategy for high impact learning such as application, synthesis and evaluation of new material.

In sum, active learning strategies differ from lecture in the level of interaction that students have with one another and the content of the course. In the next section, I will discuss some of the common active learning strategies observed during this research.

**Active learning strategies.** Bowen (2012) argued that a benefit of technology is the time outside of class that can be spent on content delivery, communication and assessment, thereby providing more in class time for active learning activities in the classroom. These active learning experiences hinge on students doing the preparatory work outside of class and being able to come to the class ready to engage with the
content. Hammer and Giordano (2012) provide examples of active learning activities which are listed below in table 3.

Table 3

*Active Learning Strategies*

<table>
<thead>
<tr>
<th>Type of Activity</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom assessment techniques</td>
<td>Think-pair-share</td>
</tr>
<tr>
<td>(CATs)</td>
<td>Tell your partner</td>
</tr>
<tr>
<td></td>
<td>Directed paraphrasing</td>
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<tr>
<td>Group based learning</td>
<td>Out of class projects</td>
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<td></td>
<td>In class group presentations</td>
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<td></td>
<td>Study groups</td>
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<tr>
<td>In class discussion</td>
<td>Small group discussion</td>
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<tr>
<td></td>
<td>Large group discussion</td>
</tr>
<tr>
<td></td>
<td>Questions, Quotations and Talking Points</td>
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<tr>
<td></td>
<td>Just in Time Teaching</td>
</tr>
<tr>
<td>Collaborative learning methods</td>
<td>Team based learning</td>
</tr>
<tr>
<td></td>
<td>Peer learning</td>
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<tr>
<td></td>
<td>Interteaching (Saville, Zinn, and Jakobsen, 2012)</td>
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</tbody>
</table>

**Classroom assessment techniques.** Classroom assessment techniques (CATs) are “brief, non-credit exercises intended to assess student understanding of the class material” (Hammer & Giordano 2012, p. 101). Hammer and Giordano referenced Angelo and Cross’s *Classroom Assessment Techniques: A Handbook for College Teachers* (1993) for a listing of over 50 kinds of CATs that can provide active learning components to classrooms. Examples of common CATs are “think-pair-share”, tell your partner and directed paraphrasing (Hammer & Giordano 2012).

**In-class discussion.** In-class discussions can occur in a variety of ways. Discussions can take place between small groups of students, medium sized groups, or a
large group discussion that involves the entire class. Class discussions require significant preparation ahead of time on the part of the instructor and the students. Saville, Zinn and Jakobsen (2014) wrote that students fail to participate in class discussions because they are not prepared (have not done the readings), do not understand the material, or are not expected to participate in other classes and therefore have formed a habit of non-participation. A variety of methods exist to ensure students are prepared for an in-class discussion including Questions, Quotations and Talking Points (QQTPs), Just in Time Teaching (JiTT) and collaborative learning methods. QQTPs are daily or weekly submissions that are made prior to class. These assignments involve students creating questions about the material, a significant quote from the material and a list of talking points that students can use during an in-class discussion. Just in Time Teaching allows students to answer several prepared multiple choice or short answer questions prior to class. After review of this assignment, the instructor can identify areas of confusion to further discuss during class time. Examples of collaborative learning methods include team based learning, peer to peer tutoring and peer instruction. Each of these examples allow students to discuss material with one another and practice elaborating and explaining the concepts (Saville et al., 2014).

**Collaborative learning.** Considering the physical classroom space when designing an active learning environment is worthwhile when designing a course. Myers and Jones (1993) state that the ideal classroom would contain:

- a room large enough to easily seat about twenty-five students in comfortable, movable desks or swivel chairs that can be arranged in a U-shape, a circle, and smaller groupings…also would have all the accouterments: good lighting,
ventilation, and acoustics; overhead projectors, and media-communications equipment galore; and plenty of blackboard or poster space (p. 44).

These activities are all possible to execute in the classroom with a minimum amount of technology, but do assume that the students are prepared to engage with the content inside of the classroom. Bowen (2012) offered the suggestion that traditional classrooms focus on the delivery of content and assume that students will “analyze, reflect, synthesize, and care” (p. 186) outside of the classroom. The addition of technology, however, allows the inverse to become possible: content occurs outside of the classroom and the “analyzing, reflecting, synthesizing, and caring” (p. 186) all happen inside of the classroom where the professor is available to guide the learning. Bowen’s (2012) concept of the ‘naked classroom’ strips the classroom of excessive technology and instead focuses on the activities of “discussing, doing, and cooperating” (p. 186).

Bowen (2012), Fink (2007) and Myers and Jones (1993) all discuss how classroom spaces intersect with active learning techniques and the delivery of course content. The consideration of the physical space and the amenities available within the classroom are critical components to incorporating active learning techniques into course design.

**Faculty Professional Development**

Faculty development programs at institutions of higher education contribute to the continued professional development of instructors in the areas of scholarship, service, and teaching. By providing learning opportunities to faculty considering teaching in an innovative classroom space and ongoing opportunities to faculty already teaching in innovative spaces, faculty developers have an opportunity to contribute to an instructor’s
professional development in a meaningful way that connects the instructor’s own experiences with best practices in pedagogy.

McCrickerd’s theoretical article (2012) hypothesized that faculty members who view teaching ability as a “gift or talent” (p. 57) are not as likely to change their teaching habits out of “fear of reaching the limit of their gift or talent” (p. 57). Howard’s exploratory qualitative research (2012) discussed resistance to technology integration in the classroom in much the same vein as McCrickerd (2012). Howard (2012) argues that instructors who are personally confident in technology usage are more likely to use technology in the classroom. This confidence produces “lower anxiety, less fear and are likely to exhibit a positive affective response towards technology use” (p. 361). The value of technology integration to teaching and learning is the second factor that impacts an instructor’s decision to use (or not) technology in the classroom (Howard, 2012). From Howard’s (2012) research, she concluded that instructors should gain familiarity with the technological tools in order to reduce feelings of “dread and anxiety” (p. 369). In order to gain familiarity, instructors should have positive and focused experiences with the technology in a way that supports learning about the technology and integrating it into the classroom.

Baylor and Ritchie’s quantitative study of 94 secondary classrooms across four states (2002) research identified that some instructors are more likely to take risks in their teaching and innovate or change their pedagogical approaches which results in an increased likelihood to integrate technology into the classroom. To help faculty members overcome this resistance to change, institutes can support faculty development in ways that celebrate risk taking. McCrickerd (2012) argues that the desire to change
one’s teaching practice requires “a perceived need to change and...persistence through ongoing difficulties (p. 61). Faculty members who choose to teach in active learning classrooms are instructors who embraced the idea of a change in their pedagogy and are willing to explore new instructional strategies. These innovative instructors should be rewarded and recognized through faculty development programs that encourage risk-taking and provide avenues to work through pedagogical our technological problems encountered while teaching in an active learning classroom.

Chism, Lees, and Evenbeck (2002) proposed a framework of faculty development closely models experiential learning theory and action research and applies to working with faculty in active learning classrooms. Teaching change occurs in four stages:

- selecting a new practice;
- experimenting with the new practice;
- collecting assessment information on the type of learning that occurred during the change; and
- reflection on the outcome of the changes and whether the changes should continue, be modified, or stopped all together. (Chism et al., 2002).

Faculty developers have the opportunity to provide support to faculty during each of the four stages outlined above through workshops, consultations, and observations.

Historically, innovation in the higher education classroom faced resistance both from faculty and students. Bonswell and Eison (1991) identified several barriers to change including that both the instructor and students in the classroom are familiar and comfortable with a traditional lecture style learning environment—this is how many
instructors learned and the expectation that students have about how they will learn in a college environment, instructors are often considered experts in their own subject matter, but do not necessarily have superior skills in delivering that subject matter, there is inherent risk in trying a new strategy, and the risk in trying the new strategy may have few, if any intrinsic or extrinsic rewards.

Professional development opportunities for faculty teaching in innovative spaces can lead to teachers gaining confidence in their pedagogy and in technology use while teaching in active learning classrooms. In a multiyear and ongoing study, Hunley and Schaller (2009) discovered four important points with regard to determining the relationship between physical space and pedagogy:

First, faculty members teach based on their comfort level with pedagogical practices. This comfort level can range from highly innovative to highly traditional teaching experiences. Second, students have a positive reaction to spaces that treat them with respect, are serious, and encourage collaboration with other students and faculty. Third, mastery of the physical space and comfort level is extremely important. The way that the space makes faculty and students feel can encourage or discourage engagement from both faculty and students. Fourth, programs that encourage “integration, faculty communication, respect for the student, and innovation with scheduling, space use, and time” are likely to engage both faculty and students and promote positive learning experiences (p. 28). Hunley and Schaller’s (2009) findings also indicate that faculty members who are less comfortable with a variety of pedagogical approaches often converted innovative classroom spaces into a more traditional layout so that the rooms have a “lecture room” (p. 30) feel. This inclination points to faculty tendency to adapt
the space to their own preferred style instead of branching out with additional pedagogies. Additional faculty development opportunities (course design assistance, consultations, and mentoring opportunities can help faculty to discover alternative pedagogical practices that work in the active learning classrooms and consider the integration of these practices in their course design.

In a comparison study of an introductory biology course taught in a traditional classroom and an active learning classroom, Cotner et al (2013) offered several observations for faculty members who teach in active learning classrooms (ALCs). Their findings suggest that instructors may need to adjust their expectations when teaching in an ALC. There is no traditional front of the classroom from which to lecture, not all students will be facing the instructor due to the seating configuration, and the interactive nature of the classroom will increase the noise level coming from the students. The authors also point out that there can be a significant learning curve when working with the technology offered in the classrooms.

In 2009, McGill University, through Educause conducted a mixed methods survey to determine the supports available to instructors teaching in active learning classrooms. The survey was sent to three Educause listservs as well as individuals listed on the Scale-up website. Thirty-five respondents answered the question, “What would be your top two pieces of advice as we develop our project and prepare to support professors in active learning classroom environments?” The answers to this survey question suggested multiple opportunities for the professional development of instructors teaching in active learning classrooms. Some of the responses included:
• development of a faculty learning community to provide training and peer support;
• develop a process for recognition of early adopters and provide continued support for these instructors;
• mentoring for instructors who are new to active learning environments;
• provide opportunities for in-class observations for those thinking about teaching in active learning classrooms;
• ongoing training—not just training upfront with no follow up; and
• provide in-class technology support for the first several sessions.

Adam Finkelstein of McGill University (A. Finkelstein, webinar, March 9, 2016) proposed a framework of faculty development activities to provide support to instructors teaching in the active learning classrooms. The framework is shown below:

![Framework of faculty development activities](image-url)
Figure 8. Framework of faculty development support available to instructors teaching in active learning classrooms at McGill University. (A. Finkelstein, webinar, March 9, 2016.)

Through teaching in active learning classrooms, instructors have the opportunity to experiment with varied instructional strategies on their own, but the more formalized professional development strategies explained above can provide guidance on the intentional pedagogies utilized in these classrooms. This formalized guidance can, in turn, educate novice instructors on the usage of active learning classrooms and instructional strategies.

The concepts of instructional strategies in higher education and faculty development are well-researched and published on in the field of educational research. Classroom design, particularly active learning classroom design, lacks a significant body of scholarly literature at this time, although more and more universities are adopting active learning classroom design and research is increasing in this field. My research looks at the three concepts together and considers their reciprocal relationships. I argue that the instructional strategies utilized in active learning classrooms both contribute to faculty development opportunities and that faculty development programming informs the instructional strategies used in active learning classrooms.

In the next chapter, I discuss the methodology of my research design, data collection, and analysis of the data.
Chapter 3: Methodology

This research was conducted throughout the EPIC classrooms on the campus of James Madison University in Harrisonburg, VA. The research occurred during the fall 2015 semester and the spring 2016 semester.

The analysis of my research study was presented as a case study of seven research subjects. I considered presenting this data as an ethnography, but after comparing ethnographies and case studies, determined that the case study method best fit my research questions and the goals of the study.
Table 4

Comparison of Ethnography Study versus Case Study Research and the Applications to this Study

<table>
<thead>
<tr>
<th>Characteristics of Ethnography</th>
<th>Application to this study</th>
<th>Characteristics of Case Study</th>
<th>Application to this research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop a complex, complete discussion of the culture of a group (Creswell, 2013)</td>
<td>This group involves a range of disciplines, and teaching experience (both in and out of EPIC classrooms). The group is not a cohesive unit that works together at this point.</td>
<td>Begins with the identification of a specific case or project.</td>
<td>The specific project is identified as instructors wishing to teach in the EPIC spaces.</td>
</tr>
<tr>
<td>Researcher looks for patterns of beliefs, ideas and behaviors of the group</td>
<td>Patterns of beliefs, ideas and behaviors are difficult to discern in a group that consists of first time and experienced EPIC instructors.</td>
<td>The intent of the case is identified.</td>
<td>The case that has an interest that needs to be described and detailed.</td>
</tr>
<tr>
<td>The group has been intact for long enough to develop working patterns with one another.</td>
<td>This group has not been together in any discernable way. The EPIC instructors meet formally once per semester to discuss their impressions, opportunities and challenges in teaching in the EPIC spaces. Although this group of instructors is a select group, they do not seem to spend time together that is focused on teaching in EPIC classrooms. Given that the instructors come from such a wide range of disciplines, it is unlikely that they would spend significant time together forming a group culture.</td>
<td>Presents an in-depth understanding of the case.</td>
<td>This case study is presented with data collected from multiple sources including interviews and direct observations of the research subjects’ behaviors.</td>
</tr>
<tr>
<td>Researchers begin with a theory in mind and uses that theory to inform the data analysis and conclusions of the research.</td>
<td>The underlying theory of this research has evolved from Bandura’s social learning theory to Kolb’s experiential learning theory and constructivism. This evolution is a direct result of literature reviews, interviews, observations, and feedback from my instructors.</td>
<td>The selection of how to analyze the data differs depending on the study.</td>
<td>This data has been categorized according to the classrooms being utilized.</td>
</tr>
</tbody>
</table>

Data analysis involves a thorough description of the

Thorough description and
Next, I will discuss the research design for my study.

**Research Design**

This study was designed to be qualitative in nature. The flow of the research design is visually represented in Figure 9 below.

*Figure 9. Research design for An EPIC teaching experience.*
James Madison University’s Institutional Research Board approved this research (Appendix A) on November 1, 2015. I obtained the list of professors (n=40) teaching in the EPIC classrooms in spring 2016 from the EPIC steering committee during the middle of the fall 2015 semester and then emailed the instructors to ask if they would complete a Qualtrics survey (Appendix B) to gauge their willingness to participate in this research. Of those 40, nine instructors completed the survey responding that they were willing to participate in the study. Next, I will discuss the participation sample, population and how purposive sampling was used to determine research participants.

Sample and Population

Professors who wished to teach in the EPIC spaces applied in fall 2015 and were (www.jmu.edu/teach-in-epic.com) chosen by a selection committee. Forty surveys were sent to EPIC instructors and nine instructors responded. Of the nine surveys completed, eight were three credit undergraduate courses, and one was a graduate course. The graduate course is outside of the scope of my research and therefore was not selected for this study. Of the remaining eight undergraduate courses, one instructor did not fully complete the survey questionnaire, and therefore was not selected for the study. The remaining seven instructors offered a rich array of teaching experience across multiple disciplines. The disciplines represented in the study are from the Colleges of Health and Behavioral Studies, Business, University Programs, and the College of Arts and Letters. Four of the seven participants had at least one semester of experience teaching in the EPIC classrooms and three of the participants were new to the EPIC experience in spring 2016. The instructors represented a range of teaching experience from one to fourteen years.
I utilized purposive sampling (Frankel, Wallen, & Hyun, 2012, p. 100) in selecting the seven study participants. They were selected based on prior information collected in the Qualtrics survey (Appendix B) and the following factors:

- teaching an undergraduate course
- willingness to be interviewed two times, audio recorded during interviews and observed for two class meetings.

**Instrumentation**

An initial survey was used to determine research participants and to collect data regarding the number of years of experience each instructor had with teaching, the number of semesters each professor taught in an EPIC classroom and the name and course number of the class taught in spring 2016. I conducted interviews and observations of each of the research subjects in January, February and March, 2016. Semi-structured initial interviews (Appendix C) were conducted of all seven research subjects. Twelve observations were completed, each with the same observation form (Appendix D). Final interviews were conducted with each of the research subjects after I submitted an IRB addendum (Appendix E) to adjust the second interview questions (Appendix F).

**Data Collection Procedures**

Table 5 below outlines the phases and timeline identified for the survey, interview, observations, and data analysis.
### Phases and Timeline of the Study

<table>
<thead>
<tr>
<th>Phases of the Study</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase I:</strong> Interview</td>
<td>November 2015</td>
</tr>
<tr>
<td>Assistant Director of Operations</td>
<td></td>
</tr>
<tr>
<td><strong>Phase II:</strong> Survey</td>
<td>November 2015</td>
</tr>
<tr>
<td>potential study participants</td>
<td></td>
</tr>
<tr>
<td><strong>Phase III:</strong> Interview</td>
<td>December 2015-January 2016</td>
</tr>
<tr>
<td>study participants</td>
<td></td>
</tr>
<tr>
<td><strong>Phase IV:</strong> In class</td>
<td>Observations completed by mid-February 2016</td>
</tr>
<tr>
<td>observations</td>
<td></td>
</tr>
<tr>
<td><strong>Phase V:</strong> Follow Up</td>
<td>late February 2016</td>
</tr>
<tr>
<td>Interviews</td>
<td></td>
</tr>
<tr>
<td><strong>Phase VI:</strong> Data Analysis</td>
<td>February/March 2016</td>
</tr>
</tbody>
</table>

Information was gathered through interviews and in class observations of the instructors teaching in the EPIC classrooms as well as the Assistant Director of Operations at the Student Success Center. Information was gathered through a variety of techniques including an initial survey to determine participants, multiple interviews and in class observations.

**Using a variety of instruments to collect data.** By using a combination of interviews and in-class observations, I was able to gain a greater understanding of the professors’ instructional strategies and how those strategies were employed in the classroom. Further, from the review of the EPIC website information and the interview information from the Assistant Director of Operations, I was able to gain a general understanding of the purpose of the classrooms and the amenities that were available to the instructors’ teaching in the classrooms. Hamre, Pianta, and Chomat-Mooney (2009)
suggest that using pre-existing instruments whenever possible. Alternatively, Creswell (2013) argues that most qualitative researchers will not use instruments developed by others, but rather will develop instruments on their own that seek to answer the research questions of the study. I was unable to locate pre-existing surveys or observational tools that fit the needs of my research. Hamre, Pianta, and Chomat-Mooney (2009) provided guidance on developing an observational tool: “delineate the specific behavioral markers of interest” (p. 93). Based on their guidance and the suggestion of Creswell (2013), I developed my own observational tool that incorporated information from my interview with Megan Driver, the Assistant Director of Operations at the Student Success Center and considered my research questions. I used the following techniques to collect data for my research:

**Writing down the questions asked (in addition to the answers received).** I developed a succinct list of interview questions prior to the interviews. These questions were reviewed and approved by the Institutional Review Board Committee. All of the interviews were audio recorded with the exception of two—where the recording device did not work during the interviews. In addition to the audio recordings, I took notes during the interview, specifically of key words used during the conversation, so that I knew which areas to go back and listen to again from the audio recording.

**Using audio and video recordings where possible and appropriate.** I attempted to record all of the interviews. The audio recorder did not work for two of the interviews, therefore 12 interviews were recorded and I relied on my handwritten notes for two of the interviews. I opted not to video record the classroom observations because
I did not feel that a video recording would significantly impact my analysis of the instructional strategies in the classrooms.

**Interviewing individuals more than once.** Fraenkel, Wallen, and Hyun (2012) describe interviewing as “to find out what is on their [participants’] minds—what they think or how they feel about something” (p. 451). A semi-structured interview was conducted with participants with a set of pre-established questions. Follow up questions were asked during the interviews for clarifying purposes. Each professor was interviewed twice—once before and once after the in-class observations were conducted. The first interviews (Appendix C) allowed me to establish a rapport with the research subjects and to ask introductory questions about the instructors’ experiences in the EPIC classrooms. The second set of interview questions were updated halfway through the observation process as I began to notice patterns of behavior through the observations. These questions (Appendix F) allowed me to ask clarifying questions of the research participants (Silverman, Cassata, Gottfredson, & Rosenfield, 2009) and provided me with a “rich source of information” (pp. 115). Fraenkel, Wallen, and Hyun (2012) suggest that interviews are often conducted towards the end of the study because they “shape responses to the researcher’s perceptions of how things are” (p. 451). However, in this case, I used the information from the first interview to better understand how the participants would utilize the EPIC classrooms.

**Observing the setting or situation of interest over a period of time.** Each class was observed two times during the first eight weeks of the semester. The in-class observations allowed me to watch the instructors’ interactions with the physical classroom space and the amenities available in the room. For these observations, I was
typically a “non-participant” (Fraenkel, Wallen, and Hyun, 2012, p. 446 and Creswell, 2013, p. 167), seated away from the students and not directly interacting with them. In five out of the seven initial observations, the instructor introduced me to the class during the first two to three minutes of the class. In one instance, I transitioned from the role of “non-participant” to “participant as observer” (Creswell, 2013, p. 166) when the instructor asked me to comment on a concept that she just explained to her class.

Data Analysis

The steps for data analysis are derived from Creswell (2013) and explained in detail below.

**Organizing the data.** Creswell (2013) recommended that the data be organized prior to beginning the analysis. I organized my data into the following categories for each participant: initial interview (I₁), first observation (O₁), second observation (O₂), last interview (I₂) and missing data (X). The table below shows the data organization:
**Organization of Data**

<table>
<thead>
<tr>
<th>Participant</th>
<th>I₁</th>
<th>O₁</th>
<th>O₂</th>
<th>I₂</th>
<th>Missing Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Completed with transcription</td>
<td>Completed</td>
<td>Not completed</td>
<td>Completed with transcription</td>
<td>Observation 2 not completed due to weather.</td>
</tr>
<tr>
<td>002</td>
<td>Completed with personal notes only</td>
<td>Completed</td>
<td>Completed</td>
<td>Completed with transcription</td>
<td>Audio recording device did not record during interview.</td>
</tr>
<tr>
<td>003</td>
<td>Completed with transcription</td>
<td>Completed</td>
<td>Completed</td>
<td>Completed with transcription</td>
<td></td>
</tr>
<tr>
<td>004</td>
<td>Completed with transcription</td>
<td>Completed</td>
<td>Completed</td>
<td>Completed with transcription</td>
<td></td>
</tr>
<tr>
<td>005</td>
<td>Completed with transcription</td>
<td>Completed</td>
<td>Not completed</td>
<td>Completed with transcription</td>
<td>Observation two not completed due to weather.</td>
</tr>
<tr>
<td>006</td>
<td>Completed with transcription</td>
<td>Completed</td>
<td>Completed</td>
<td>Completed with transcription</td>
<td></td>
</tr>
<tr>
<td>007</td>
<td>Completed with personal notes only</td>
<td>Completed</td>
<td>Completed</td>
<td>Completed with transcription</td>
<td>Audio recording device did not record during interview.</td>
</tr>
</tbody>
</table>

**Reading and memoing.** Creswell (2013) recommends “writing notes or memos in the margins of field notes or transcripts or under photographs helps in this initial process of organizing a database” (p. 183). Out of seven initial interviews, I used five transcripts and my personal notes from two interviews. I then reviewed observation notes from all 12 in-class observations, and finally, reviewed the transcripts for the second set
of seven interviews. Approximately three days later I reviewed each participant’s data set (interviews and observations) individually to look for themes within each participant’s individual data.

Describing, classifying, and interpreting data into codes and themes. The next step is to describe, classify, and interpret the data. These codes represent the “heart of qualitative data analysis” (Creswell, 2013, p. 184). Creswell (2013) explains that “detailed description” (p. 184) occurs when the researcher describes what she sees, within the context of the event. Creswell (2013) defines coding as “aggregating the text or visual data” (p. 184). Based on Creswell’s recommendation, I then began the process of reviewing and re-reviewing the data in the interviews and observations. I chose to search for emergent codes in the data rather than “pre-figured” (Crabtree & Miller, 1992 as cited by Creswell, 2013) codes so as not to limit my research findings.

Interpreting the data. I interpreted this data based on themes that repeated through some or all of the experiences of the seven research subjects. In the initial review of the data, I identified broad themes, in the secondary and tertiary reviews of the data, I identified sub-themes that fit within the broader categories and outlier themes that did not fit within any of the broad themes. These themes are represented in Chapter 4.

Representing and visualizing the data. The data were visualized in taxonomies (shown in Chapter 4) that helped to organize the data.

Validity and Reliability

“Qualitative researchers strive for understanding, that deep structure of knowledge that comes from visiting personally with participants, spending extensive time in the
field, and probing to obtain detailed meanings” (Creswell, 2013 p. 243). Researchers have different constructs of validity and reliability and how it factors in to qualitative research. In this section, I will address the attempts at validation and reliability of my research.

**Validity.** In an attempt to better understand the concepts of validity and reliability and how they relate to qualitative research, I consulted works by Creswell (2013), Whitemore, Chase, and Mandle (2001), Wolcott (1994) and Eisner (1991). Creswell recommends using at least two of the eight validation strategies that he lists. The strategies that I utilized are listed below in Table 7.

Table 7

<table>
<thead>
<tr>
<th>Validation Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triangulation—use of multiple data collection tools</td>
</tr>
<tr>
<td>Clarifying researcher bias</td>
</tr>
<tr>
<td>Member checking</td>
</tr>
<tr>
<td>Rich, thick description</td>
</tr>
</tbody>
</table>

I collected data from each of the research subjects through multiple interviews and observations. Each interview and observation further informed subsequent interviews and observations as I got to know the instructors. My bias as a research has been discussed in this thesis. Each of the research subjects were provided with professional transcriptions of each of the interviews. I asked each research subject to review the transcriptions and provide any edits or changes to me. None of the research subjects
provided significant changes to the transcriptions. The description found in chapter four of this thesis is arranged first by EPIC classroom and then by emergent theme. The description provided aims to show the connections between the emergent themes and the research questions of this study.

**Reliability.** Creswell (2013) discussed two strategies to increase reliability in qualitative research. The first strategy is obtaining detailed field notes and transcription of interview data. The second strategy is intercoder agreement, wherein multiple researchers code the collected data and look for “stability of responses to multiple coders of data sets” (Creswell, 2013 p. 253). Intercoder agreement was not conducted for this study and is listed as a limitation in the next section.

**Limitations**

I identified several limitations in this study. First, due to the winter weather in January and February, I was not able to complete two scheduled in-class observations. Second, the period of time in which I was able to collect data was relatively short (January, February and early March) and done while I also worked at a full-time job. Third, the sample size was small and it was necessary for me to use both new and experienced EPIC professors. Fourth, I should have included interviews members of multiple key informants—namely members of the EPIC steering committee to incorporate with Megan Driver’s background information. Lastly, I conducted this research alone and therefore collected and coded the interview and observational data myself, which means that I may have missed an emergent theme or other key piece of information.
Threats

This study is purely qualitative and therefore external validity and generalizability cannot be established (Fraenkel, Wallen, & Hyun, 2012); rather, this study attempts to deeply explain the individual experiences of the instructors teaching in the EPIC classrooms. The findings of this study cannot be generalized to active learning classrooms at other mid-sized universities. The study allowed me to make generalizations regarding the EPIC classrooms at James Madison University. Other researchers can transfer the ideas and findings from my study to their own situations and determine if conducting a similar study may be advantageous.

Subject characteristics. Although personal demographics (race, age, gender) were not a consideration in this study, there was considerable variability in the professional characteristics of the research subjects. Subjects represented a range of disciplines, years of teaching experience, and semesters of experience as EPIC instructors. In an attempt to one of these variables, I initially planned to only work with instructors who had at least one semester of experience teaching in the EPIC classrooms; however, after reviewing the survey responses requesting study participants, I found it necessary to involve instructors with no EPIC experience in order to have a large enough sample to work with.

Data collector characteristics. I am the only person collecting data for this research. As the only researcher, my collection techniques should be consistent across all six research subjects. Conversely, because I am the only person collecting data, there is an opportunity for me to miss a theme in the interviews or observations that a second data collector may see.
Data collector bias. As a student, I experienced lecture based courses with little active engagement by the students. The lecture format is one that I am comfortable with and understand. As a graduate student, I experienced some active learning scenarios, but still maintain comfort with the lecture based format. It is my goal to be transparent with myself during the data analysis and to challenge any negative assumptions that I may make about active learning or learning environments during the analysis process.

To validate the interview data, I gave research participants the opportunity to review the transcripts in order to clarify or change any of the information provided in the interviews. No one made substantial changes to their transcriptions and three subjects chose not to review the transcriptions.

Protection of Human Subjects

This research falls into IRB Category II (Expedited Review) because it is a classroom research project that posed no more than minimal risks to the participants. There was no deception involved in this study—each of the participants were informed of my research prior to agreeing to participate in the study (Fraenkel, Wallen & Hyun, 2012). Along with the IRB approval process, study participants signed an informed consent form (http://www.jmu.edu/researchintegrity/irb/).

The research for this study was conducted confidentially, with the exception of the Assistant Director of Operations for the Student Success Center, Megan Driver. Megan agreed to have her name associated with her interview responses and therefore her name is known in this study. Her position at the Student Success Center made keeping her name confidential nearly impossible.
The participants in the research study were identifiable only to me during this study. For the analysis and discussion of the findings of my study, research participants were assigned numbers which were used as identifiers in this research. Interview transcripts, observation field notes, and consent to participate in research forms were stored in a locked filing cabinet at my home. Audio recordings were transferred from an audio recording device and stored on a single, encrypted, JMU issued computer.
Chapter 4: Findings

In this chapter, I discuss the findings of my research. Seven instructors participated in the interviews and observations for this study. Findings of this study included the use of the following physical amenities: flexible furniture, multiple projection screens and certain technologies, and writable walls. Instructional strategies most often observed were lecture, small and large group discussions and variations of team learning.

Instructors chose to teach in the EPIC classrooms for reasons ranging from the ability to experiment with different pedagogical strategies to the convenience of the classroom location. Experimentation with pedagogy and instructional strategies provided personalized professional development opportunities for instructors who were able to re-conceptualize strategies in traditional classrooms.

The tables below provide a summary of demographic information about each of the research participants.

Table 8

<table>
<thead>
<tr>
<th>Unique Identifier</th>
<th>College-level affiliation</th>
<th>Number of Years of Teaching Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>College of Arts and Letters</td>
<td>1</td>
</tr>
<tr>
<td>002</td>
<td>College of Business</td>
<td>14</td>
</tr>
<tr>
<td>003</td>
<td>College of Arts and Letters</td>
<td>5</td>
</tr>
</tbody>
</table>
Table 9

**Instructors with Prior Experience Teaching in the EPIC Classrooms**

<table>
<thead>
<tr>
<th>Unique Identifier</th>
<th>College-level affiliation</th>
<th>Number of Years of Teaching Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>004</td>
<td>College of Health and Behavioral Sciences</td>
<td>3</td>
</tr>
<tr>
<td>005</td>
<td>University Programs</td>
<td>5.5</td>
</tr>
<tr>
<td>006</td>
<td>College of Health and Behavioral Sciences</td>
<td>7</td>
</tr>
<tr>
<td>007</td>
<td>College of Health and Behavioral Sciences</td>
<td>12</td>
</tr>
</tbody>
</table>

**Background information on the EPIC classrooms**

To attain background information on the EPIC classrooms, I interviewed Megan Driver, Assistant Director of Operations at the Student Success Center. Megan provided me with a framework of amenities offered in the EPIC classrooms and discussed some of the challenges that she observed with the EPIC classrooms. This interview was conducted in November, 2015 as a way to orient myself with the classrooms and to understand the opportunities and challenges presented by the EPIC classrooms.

Megan identified the following amenities as available in the EPIC classrooms:
Table 10

Amenities Available in EPIC Classrooms

<table>
<thead>
<tr>
<th>Amenity Available</th>
<th>Amenity Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry erase walls</td>
<td>All four walls in each of the classrooms are painted with dry erase paint making it possible to write on all of the walls.</td>
</tr>
<tr>
<td>Movable chairs and tables</td>
<td>All chairs and tables in most of the classrooms can be easily moved (allows for flexibility of set up for the classrooms)</td>
</tr>
<tr>
<td>Recording capabilities</td>
<td>Classroom is equipped with video and audio recording capabilities.</td>
</tr>
<tr>
<td>Multiple projection points</td>
<td>Classrooms have multiple projection points throughout the classroom; allows for different material to be projected in different areas of the classroom; or for the same material to be projected in multiple places in the classroom</td>
</tr>
<tr>
<td>Mac or PC set up available</td>
<td>The technology in each classroom can be controlled by either Mac or PC platforms</td>
</tr>
<tr>
<td>Apple TV available</td>
<td></td>
</tr>
</tbody>
</table>

From an operational standpoint, Megan identified the following challenges with the EPIC classrooms:

- Technology: Megan states, “The technology is the Achilles’ heel and the best part about the classrooms.” There is no audio visual/technology staff specifically dedicated to the EPIC classrooms or issues that may arise with the technology; the professional operations staff and the student staff that work in the Student Success Center are all trained to troubleshoot basic technology issues; however this is not their only job responsibility. Megan believes it is difficult to focus addressing a technology issue that an instructor is having during the class meeting time.
University schedule: Because of the university’s set class schedule, there can be a limited amount of time for the Student Success Center’s operations team to reset the classrooms. Professors can provide Megan with instructions on how they would like their classrooms to be set up and then Megan’s staff takes care of resetting the classroom before class begins. This timeline can be difficult when there are back-to-back classes occurring in the classrooms. Allowing for the resetting time was an oversight that occurred when the building was brought online.

Student presentations: Students are asked to come prior to class to load any presentations they may be giving in class on a particular day. This can create a timing issue that depends on: where the student is coming from (e.g. east side of campus, off-campus housing) and what medium the student is downloading the presentation from (e.g. email, flash drive, personal device. Megan stated, “The more technology you have, the more problems you have.”

Instructors in this study taught in classrooms 4041, 4043, 4044, and 4046, which are described here.

Room 4041. Room 4041 is a classroom set up with pods that seat 5-6 people. Each pod has an LCD screen, flexible seating and plug-in points. The tables and LCD screens are stationary and unable to be rearranged. There is one projector screen in the room that is shown in Figure 11 below. The instructor station and the tables and chairs are on casters and able to be moved about the room. This room
differs from other EPIC classrooms in that there is no interior window in the classroom. The other classrooms have exterior windows (facing outside) and interior windows (facing into the hallway of the building) in the classrooms.

Figure 10. Layout of room 4041 with additional notes marking the movable instructor station, pods one through four, the location of the 5th pod, and the potential blind spot in the room.

Figure 10 is somewhat misleading as there are five pods in the classroom—with the fifth pod located in the area of the bottom of the figure. Research participants 002 and 003, each taught a class in room 4041 in spring 2016.

**Room 4044.** Room 4044 is a large classroom that accommodates up to 94 students. There are six projector screens, wireless accessibility, and recording capabilities. The tables in the room are rectangular and on casters as are the chairs and instructor station. There are exterior windows facing outside of the building and interior windows that face to the 4th floor hallway. There are blinds on the interior and exterior
All of the blinds are controlled with one device; therefore in order to put the interior blinds down, the exterior blinds must also be down.

Figure 11. Photograph of EPIC classroom 4044 with additional marking of instructor station between two projector slides.

**Classrooms 4043 and 4046.** Classrooms 4043 and 4046 are medium-sized classrooms that seat just under 50 students each. Each classroom has 3 projector screens, a movable instructor station, interior and exterior windows, and tables and chairs on casters.

Participants 001 and 004 taught in classroom 4043 and participant 005 taught in classroom 4046. Participants 004 and 005 were both observed one time—the second observations of each of those classes were cancelled due to inclement weather. Participant 005 summed up his experience in the EPIC classroom in two sentences, “The room has really just changed the nature of what I do and how I do it. It’s as simple as that.”
Figure 12. Classroom 4043 with additional markings for instructor station, and screens one, two and three.

Figure 13. Drawing of classroom 4046 with no additional markings.

The typical set up of classroom 4043 appeared to shift from Figure 12 (represented as a typical set up on the EPIC website) to having the instructor podium set in the location noted on the diagram above. During my observations of instructors 001 and 004, neither instructor used the space in classroom 4043 on the left of Figure 12 as represented above.
The interviews and observations were reviewed multiple times to identify emergent themes in the data. The first two reviews of the data discovered these emergent themes:

Figure 14. First two reviews of data for emergent themes.

The core findings of this research study are presented below and have been arranged by research question. The data used for each research question is listed below in the following table:
Table 11

*Data Used to Answer Research Questions.*

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Interview Data</th>
<th>Observation Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>What physical amenities are most often used in the EPIC classrooms?</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>What instructional strategies are used in the EPIC classrooms?</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Why do instructors choose to teach in EPIC spaces?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How has teaching in the EPIC classrooms impacted the instructors’ professional development?</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**What physical amenities are most often used in the EPIC classrooms?**

The emergent themes discovered regarding the physical amenities in the EPIC classrooms are outlined in the taxonomy below:
Figure 15. Taxonomy of emergent theme of “classroom.”

**Layout of the classrooms.** The tables and LCD screens in the room 4041 are unable to be moved. There is one projector screen in the classroom, which serves as a focal point for student attention when the instructor is using the screen. Participant 003 said of the layout of the room, “I do not even know what a group based presentation looks like a pod based environment. I have to figure that out…In that room anyway, you can’t reorganize to create a traditional audience…the tables are bolted to the floor.”

Classrooms 4043, 4044, and 4046 are all more flexible spaces that allow for the furniture to be moved. In all of the observations in these three classrooms, the classroom layout was essentially the same for each observation. All four classrooms in this study
have at least one screen per wall, windows on the interior wall (facing into the hallway) and windows on the exterior wall (facing outside). I noted several students in room 4046 waving to other students in the hallway during one observation. Participant 005 noted that the interior windows were distracting due to the attempted communications with students outside of the classroom.

**Instructor movement.** Both instructors that taught in room 4041 walked up and down the center aisle of the classroom during lecture/discussion time and both instructors visited each pod during group work time. Participant 002 had a goal of getting out from behind the podium and walking around throughout the classroom more often. She believed that the EPIC classroom helped her to reach that goal. The instructors teaching in room 4044 (the largest classroom) led their classes from a close proximity to the instructor station located in front of the interior windows in the classroom (see Figure 12). Participant 007 experienced a technology issue during O₁ and needed to move the instructor station to the left wall. After the instructor station was relocated, Participant 007 walked back and forth from the new location of the instructor station to the previous location throughout the lecture and class discussion. When I asked her about this during I₂ she explained that she walked to the new instructor station location to advance the PowerPoint slides and returned to the previous location to speak because she felt that that previous location was more centrally located and that all students in the classroom could see and hear her equally from that location.

In classrooms 4043 and 4046 (the medium sized classrooms), Participants 001 and 005 stayed close to the instructor station during lecture and discussion periods of the class, but participant 005 moved about the room during group exercises to work with the
Participant 004 moved around the classroom more frequently during lecture and discussion periods than the other participants in this study.

**Flexible furniture.** The instructor station and the student chairs are the flexible furniture in room 4041. Participant 002 moved the podium up and down the center of the classroom during O₁ while lecturing to the class. Participant 003 kept the podium near the side of the projector screen during both observations. The students in both participant 002 and 003’s classes were in semester-long teams. Participant 002 identified that there were potential “blind spots” in the room (marked in figure 15 above) and said this about the room layout:

No matter where you stand, someone’s back is always to you. That’s the only thing that I really dislike is that someone’s back is always to you because of the nature…I’m moving students to a new table every two and a half weeks, so they rotate around the room, and they don’t like doing this, but I strongly encourage them to sit in a different seat within their tables so it’s not the same person who’s back is always to me for that two weeks.

The tables, chairs, and instructor station are all on casters and movable throughout rooms 4043, 4044, and 4046. During observations with participants 006 and 007, the instructor station was positioned in front of the interior windows as shown in Figure 12. Participant 007 had a technology issue during O₁ that required her to move the instructor station to a plug in point on the left wall—thereby shifting the location of the instructor.

Both of these classes are large (50+ students) and were placed in permanent teams for the semester. Neither instructor 006 or 007 asked students to move tables or chairs
during any of the four in-class observations that I completed. The table configurations for both classes were similar—set in pods, with two rectangular tables facing one another and eight chairs set around the pod. In participant 007 second observation, I noted that the pods were not located in the same spots as during the first observation. Just before class started a student seated near me stated, “we get shifted around for every class” (Anonymous student, 2/25/2016).

Participant 007 feels that the layout of the classroom and the flexible furniture makes it much easier to use team-based learning in the classroom. She indicated that she previously taught this course in a large auditorium with fixed seating and was able to “make it work” but auditorium style seating made team-based learning activities “awkward”. Participant 006 also previously taught in a large auditorium and confirmed participant 007’s statement:

I typically teach in [large auditorium]. It is fixed seating…It’s not easy for myself and my TAs to get around to discuss with the students…all of us cannot easily access all of the teams. In [the auditorium] where I typically teach sometimes I have to climb over a desk to get to one of the teams where I have to be very careful about how I space the teams.

None of the three participants (001, 004 and 005) teaching in classrooms 4043 and 4046 asked the students to change the setup of the classroom during class time and none of the participants moved the instructor station from the initial location at the beginning of the class.
During participant 001’s in-class observation, the students participated in an in-class activity to demonstrate the abilities of Frederick Taylor’s assembly line efficiencies. The activity began by having students make Valentine cards for someone special in their lives. Students were given scissors, markers, glue, stickers, and tape to help them complete the activity. After making two individual Valentine’s “managers” (also students from the class) arrived and informed the remaining students that the class needed to make over 100 Valentine cards in exactly the same way in approximately 20 minutes. The students were given the same resources to complete the task, but were also told that they could rearrange the classroom in whatever way they felt might make it easier to complete the activity.

In I₂, participant 001 and I discussed this activity for several minutes. Participant 001 expected (as did I) that the students would rearrange the classroom to form a traditional assembly line in order to make the Valentine’s and increase the efficiency of the process. This hypothesis proved incorrect as the students remained in pods with each pod being setting up its own type of assembly line. At the end of the activity, participant 001 debriefed the activity with the students in the class and discovered that none of the students considered rearranging the furniture.

Writable walls. The writable walls room 4041 were used in participant 002’s class during both observations by the students and the instructor. The walls were used in participant 003’s class during the first observation by the students only but not by the students or instructor during the second observation. During my observations, I noticed that pod five was unable to see anything that pod three wrote on the wall and that pod five was somewhat blocked from seeing the students at pod three due to the build out
of the wall. The build out is not portrayed in the above diagram, but puts students seated at pod five at a considerable disadvantage to see anything that the students at pod three put on the walls. Participant 002 noted in the final interview that, “I struggled with what is one place where I could just write something [on the writable walls] and I could see it….I’ve stopped writing as much. I put it into my PowerPoint.”

Participants 006 and 007 used the writable walls in room 4044. Participant 006 used the writable walls for an in-class activity with the students. Students from each pod answered questions on the walls and then an in-class discussion was based on the information put on the walls. Participant 006 photographed the information at the end of class to send to the students. She stated during I1 that she planned to use the walls for activities and then photograph the work on the walls throughout the semester. The work would then be sent to the students after class and would serve as the notes for the class period.

Participant 007 used the walls during the second observation to note specific points during lecture/discussion. No activities in any of the classes necessitated student use of the writable walls. One of the challenges with the writable walls in this classroom is that with the size of the classroom, it is difficult for students on one end of the room to see what is written on walls on the other end of the room. This challenge was noted during participant 006’s in class activity with students and participant 007’s lecture notes. Participant 007 noted this about the writable walls:
So many people seem to love the idea of writing on the walls and I feel the need to write on the walls for the sake of wiring on the walls, but I don’t know if there’s a pedagogical benefit to that.

Participant 001 did not use the walls during the in-class observation. As much of the class period was taken up with the assembly line activity, I do not know if she typically uses the walls or not, but she believes that the walls are the “most important thing” in the classroom. In a traditional classroom, she has to “get newsprint, then I had to get tape, and then I had to tape things on the walls and then I’m carrying around a bunch of newsprint.”

Participant 004 used the writable walls during class more than any other research subject. Although her students never used the walls during the observations, the instructor wrote on the walls at various locations throughout each of the classes that I observed.

Participant 005 used the writable walls for an in-class activity involving the students. Each pod of students was asked to come up with three to five concepts that needed further clarification from the assigned readings and then asked to write those concepts on the wall. The instructor then used the information from the walls to engage the students in a discussion on the assigned readings.

**Technology.** The technology in these classrooms was observed in use and discussed throughout the entire study. Because of the importance of the technology in the classrooms, sub-themes were identified during the data analysis. The taxonomy of technology topics is shown below:
Figure 16. Taxonomy of emergent theme “technology.”

The classrooms offered many options for technology. Wireless access is ubiquitous throughout the Student Success Center and accessible in all classrooms. Participants 002 and 003 both used the projector at the front of the classroom in room 4041. Participant 002 plugged her own laptop into the room’s system and projected a PowerPoint presentation throughout the class period. Participant 003 preferred to use the I-pad available in the room to project his Prezzi presentation. Participant 003 was able to move about the classroom during lecture and discussion because he carried the I-pad in his hand and was able to advance his slides remotely. During O₁, Participant 002’s laptop was placed on the podium which she moved up and down the center of the classroom and advanced her slides from the laptop. During O₂, she used a “clicker” to advance her slides and was able to move more freely throughout the center of the room during lecture and discussion.
Participant 003 discussed the restrictiveness of the technology in the EPIC classrooms during his first and second interviews. He found three aspects of the technology in the classroom to be restrictive:

- Getting “kicked off” of the wireless system during class and having to stop lecture/discussion to re-connect.
- The use of Apple technology—he prefers “PC” computers and finds the use of the Apple technology to be cumbersome. Conversely, he also finds it difficult to connect his own technology to the room’s system and prefers instead to “deal with” the Apple technology.
- As an instructor, he is only able to project to the main screen at the front of the room. He would like to be able to project (the same or different) material on the LCD screens located at each of the pods.

Participant 003 noted the challenges of the technology in the classroom:

The overarching thing is being frustrated more than anything with the technological limitation of the room. I kind of imagined it as a space where I could do anything, even if I didn’t know anything, and now it’s only like I can do the same things that I would normally do.

Neither participant 002 or 003 encountered technology difficulties during the in-class observation times. During the observations of both classes, students had the opportunity to use the LCD screens at the pods during class time. Instructors used the LCD screens in much the same way—to have student’s bring up information from Canvas, the learning management system utilized by the university, and to do web searches for information.
pertinent to in-class discussions. In all four observations, I noticed that, while the students often brought up the information that the professor requested, there were also times when the student whose laptop screen was projected on the screen was distracted by other information. I noted Facebook pages on two occasions and the ESPN website on one occasion.

The most utilized technology during the observations that I conducted during these two classes was the instructor’s ability to project on to the screen at the front of the classroom. Participant 003 noted during I2 that he planned to use the cameras to record student presentations later in the semester, but at this point in the semester (the end of February) he had not yet used that technology. Participant 002 also noted that she tried to use the cameras in the classroom to project images to the back of the classroom, but that the technology did not work the way that she thought it would and would likely not use it again. She said, “I thought that it would be a good idea, but it’s a lot more trouble honestly to switch between camera and PowerPoint…I don’t want to stop what’s going on, stop the discussion so I can get a camera right.”

Some technology difficulties were noted in the largest classroom, room 4044, and were discussed by one of the participants during the interviews. Both instructors used technology to supplement the in-class lecture/discussion. Participant 006 used her own Apple technology to display a PowerPoint presentation on all six screens in the room. During the in-class observations, participant 006 lost connection with the Airplay at one point, but was able to quickly reconnect without assistance.
Participant 007 encountered multiple difficulties with the technology in the classroom. During the first observation, there were no connection cables in the classroom, and participant 007 had to obtain them from the help desk. She was unable to turn on the projectors or to get her PC laptop computer to connect to the technology in the room. Participant 007 and her graduate assistant both worked on this issue for several minutes before getting an EPIC student assistant to help them. The student was also unable to connect the PC computer to the room’s technology. These difficulties resulted in the instructor station being moved to another plug in location in the classroom so that the participant 007 would be able to project on the screens in the classroom. One of the in-class activities during O1 was supposed to use “clickers” to poll the class. Participant 007 could not get the clickers to work and therefore had the students raise their hands during the polling activity. During O2 participant 007 encountered flickering screens at the beginning of class. She asked for, and received, assistance from the EPIC student assistant. In my second interview with participant 007, she expressed frustration at the continued technology issues. She does not believe that the cause of the problem is using her own PC technology. She stated that she used two different PC computers in the classroom and encountered the same difficulties.

Instructors 001, 004, and 005 each used technology during their classes in rooms 4043 and 4046 periods. In classroom 4043, participant 001 only used screen one (see Figure 17). Given the distance between the instructor station location and screen one, participant 001 clearly separated herself and the instructor station from the screen location. This was a striking visual image for me during the observation and evoked thoughts of the saying “sage on the stage versus guide on the side”. Also in classroom
participant 004 used the screens differently than other participants in the study. Screen one was a static PowerPoint slide that stayed the same from the beginning of class to the end of the class. The slide showed a set of class norms that were established by the class members on the first day of class. The norms were posted during each class to remind the students of the guidelines that they created and agreed to for in-class discussions. Screens two and three were used by the instructor during O2 throughout the class with PowerPoint slides and videos. There was initially a difficulty with the audio in the classroom, but this was fixed by the instructor and required no assistance from the EPIC student assistance to do so. Participant 004 did not use screens two and three during O1.

Participant 005 used the screen to display PowerPoint slides closest to the instructor location during the class. The other screens in the room were not used. As I observed this class, I noticed that the use of only one screen in this room was a challenge to students sitting in the back of the classroom. I was located at the opposite end of the room from the screen and had a difficult time seeing the information posted on the screen.

None of these three instructors had difficulty with technology that required help from the student assistants. Participant 004 described the process that she uses before each class to ensure the technology works as expected:

The only challenge, honestly, is technology working properly…I’ve got a three deep system. I bring my iPad is tier one for what I want to use. If that doesn’t work, or isn’t functioning properly in the room, I bring a laptop. If that doesn’t
work, then I go the last resort backup, which is the room iPad, which I despise, but if I have to then I will….I go into the EPIC classroom at least a half an hour before I start….Sometimes there are problems, so if I get there early enough, it doesn’t cause me stress.

What instructional strategies are used in the EPIC classrooms?

Figure 17. Taxonomy of emergent themes of instructional strategies.

The instructors in this study employed a number of instructional strategies in the classroom. Based on my observations, the strategies employed in classrooms 4041, 4043, 4044 and 4046 are listed below in Table 11.

Table 12

<table>
<thead>
<tr>
<th>Participant number</th>
<th>Anticipated strategies</th>
<th>Lecture</th>
<th>Small group discussion</th>
<th>Large group discussion</th>
<th>Team learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Group work and share out to entire class; better monitor what students are doing in class “surveillance technique” (Personal</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Interview, participant 001</td>
<td>002</td>
<td>003</td>
<td>004</td>
<td>005</td>
<td>006</td>
</tr>
<tr>
<td>---------------------------</td>
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<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>More focused time with individual groups; more physical movement by instructor and students</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Very little lecture, team work, easier use of computers and technology for students</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>“engaged learning strategies”; activities, recording of facilitations and critiques, simulations</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“small group discussion and activities”; simulated activities to work on; write on walls during discussions and activities</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hybrid class—prep work done online and then activities in class; work in permanent teams for discussion and quizzes; engage as an instructor</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
The pervasive strategy employed by all seven participants was in-class discussion—in both small and large groups. This strategy was discussed by all of the participants and was observed in all of the observations that I completed. Group discussions were used to answer questions, discuss confusing concepts, and perform activities. One of the underpinnings of these discussions is the assumption, by the instructor, that the students did the necessary preparatory work outside of the class in order to fully participate during the in-class discussions. Participant 006 employed a group quizzing activity during both in-class observations to test the students understanding of the concepts from the out of class readings.

Participant 004 used a role playing activity during O2. In the roleplay, participant 004 and the graduate assistant modeled behavior in peer to peer interactions for the students to observe.

**Why do instructors choose to teach in EPIC classrooms?**

This research question provided insight into why these seven instructors choose to teach in the EPIC classrooms. Themes identified in the responses are shown in the taxonomy below:
The research participants’ answers are listed below:

**Physical space.**

I felt constrained. There are new possibilities. There were some really specific activities that I felt constrained with. There were maybe three or four of those I thought potentially could have worked better in a flexible room. That was probably the first thing with these activities, made me want to do it. Now there are other things that I think are more strategic too, that make me want to come back, which is, a lot of it is the walls. I like being able to write on the walls. More importantly, I like the students to be able to write on the walls and look at each other’s work, and engage with each other’s work that way.—Participant 1

One is just something different, a new environment…When I saw this opportunity, I thought it might be a good to just try something different, try the
same class in a different space…Then I started looking at the space and learning more about it and I started to feel very excited.—Participant 2

For me, the question was whether or not space creates meaningful differences for the students. Does physical space actually change attitudes, approaches, etc? The other thing was that I’ve been making the transition from ‘sage on the stage’ to ‘guide on the side’ and getting into an EPIC room forced me to make that transition more completely, more quickly, so that was helpful. I was really interested to just know there’s a lot more energy and excitement about these…—Participant 3

I really like the physical flexibility of them, but also the opportunities that they present to do things in a way that students aren’t used to. I think novel is good for education, so let’s write on the walls. Let’s spin around and look backwards and look at this screen that has this on it. Things like that. I think it’s good to keep me and them on their toes.—Participant 4

I was looking for a stable place because I teach a class that’s one day a week. Those classes don’t have priority in room scheduling, so I was moved all over campus. Every semester, I’d have to get used to a new classroom. Two, I’m in this building, so it certainly makes a lot of sense for me to try and to teach in this building. It works well with my students. Also my office is just right upstairs from my classroom. Three, just the space in and of itself. It was just different. It was just bright. It was more airy…It allowed me to do things in the classroom that I’ve never been able to do before. I wanted the opportunity to try and modify
some things and bring some things in the classroom that I never could… My activities have become more robust, requiring more time on the part of the students in the classroom to critically think through them, which I just didn’t have that before.—Participant 5

The flexible space, that was my biggest thing.—Participant 6

Well, it’s most desirable because of the actual physical space, the fact that they’re pods and so it’s easier for them to talk to each other in teams.—Participant 7

“Sage on the stage versus guide on the side.”

I felt like it would be a place where my teaching would come more alive because something I struggle with… you know that old ‘sage on the stage’. I’m standing at a podium, behind a desk. I thought this would force me out of my comfort zone a little bit more, so I thought it would be a way to stretch my teaching.—Participant 2

Team learning.

Then, a third reason is I was very excited when I saw that there was an opportunity for students to sit with teams and work with their teams and have their own unique monitor where they could work on their projects because my classes are very project intensive, very team intensive. The room was just structured so perfectly for that component.—Participant 2

With doing team based learning, it’s nice to be able to have the teams actually be able to see each other and work together, rather than trying to be contortionist
artists and try to figure out how to sit on desks and what not to discuss.—

Participant 6

I use team based learning the first two semesters that I taught in there and that is just really important for teamwork because I think it’s very sub-optimal in rows and the traditional auditorium style classrooms. It’s just awkward, they have to literally turn their backs, look behind them…Even when I’m doing less team work like this semester with interactive lecturing, it’s still the fact that they’re facing each other just promotes more inner student discussion.—Participant 7

How has teaching in an EPIC classroom impacted the instructors’ professional development?

Each of the research participants shared differing ideas about professional development and how using the EPIC classrooms impacted (or did not impact) their own development as instructors. Emergent themes are shown below.

**Figure 19.** Taxonomy of professional development emergent themes.

**Strategies for traditional classrooms.** Participants 006 and 007 both stated that they would try some of the activities used in the EPIC classrooms in traditional classroom
spaces. Participant 007 also saw this experimentation as an obstacle. She felt that she would have experimented more with additional activities if she knew that she would permanently teach in an EPIC space.

**Additional teaching strategies.** Participants 001, 003, and 004 acknowledged that they have explored different teaching strategies and pedagogies in the classrooms. Participant 001 stated:

Where one of the things that the room kind of evokes is a sense of guilt when you aren't using it effectively. Not to advocate guilt or anything like that, but being compelled to think about how you can use the room to its biggest potential has certainly lead me to think in more complex ways about how I am making sure the information gets across, how I'm fostering engagement between the students.

**Additional Themes**

The themes of “hiding”, “more time”, “introversion” came up during the interviews conducted with some of the participants. These themes did not provide answers to my research questions, but I have chosen to address them because I believe that they contribute to this study as a whole.
Participants 002 and 005 discussed the concept of “hiding students”. Each of these participants felt that the EPIC classrooms encouraged more active participation by the students in the classrooms and were less likely to be distracted. Participant 005 stated that she was unsure if this was due to the setup of the room, the close proximity of students to one another and to the instructor or the fact that the instructor was able to more freely walk about the room during class time. Participant 002 echoed similar thoughts and felt that there was much less “goofing off” in class because the students work in their teams in a semi-public environment where the instructor and other teams are able to hear and see (somewhat) what is happening during group work. Participant 001 mentioned in both of her interviews that the proximity of her to the students in the classroom afforded a level of “surveillance” on student work that is not attainable in a more traditional environment.
Participant 007 brought up the concept of “introversion” and discussed that as an introvert, the EPIC space made her consider ways in which she needed to protect herself in a classroom that lends itself so well to active learning.

To summarize, multiple emergent themes were discovered during the data analysis that provide continued evidence that space impacts learning in higher education classrooms. The technologies and teaching strategies used in the EPIC classrooms allowed the instructors the ability to experiment with pedagogy and reimagine content delivery in ways that encourage higher levels of interaction between the students and the content and the students with one another and the instructor. The close proximity of the instructor to the students and the students to one another transitions learning from an individual and passive activity to a group based collaborative experience. Interviewing and observing these instructors also brought about additional questions for future research.

In the final chapter, I will discuss why these findings are important to the evolution of active learning techniques in innovative classroom spaces, and how these findings suggest faculty development as an additional support for instructors teaching in EPIC spaces. I will also pose several areas for further research including longitudinal studies, the impact of active learning classrooms on introverted instructors and students, and the creation of faculty development programming to support the needs of instructors teaching in active learning classrooms.
Chapter 5: Discussion and Conclusion

In this final chapter, I discuss the key findings of the interviews and observations conducted with the seven research subjects, implications for practices, recommendations for future study, and overall conclusions from this research. This study was conducted in order to better understand what happens in innovative classroom spaces and how these opportunities impact the professional development of the instructors.

Overview of Key Findings

The initial research questions for this study were:

1. What physical amenities are most often used in the EPIC classrooms?
2. What instructional strategies are used in the EPIC classrooms?
3. Why do instructors choose to teach in EPIC spaces?
4. How has teaching in the EPIC classrooms impacted the instructors’ professional development?

After all of the data were collected and analyzed, themes emerged regarding the EPIC classroom spaces, instructional strategies, instructor’s motivations to teach in these spaces, and thoughts on professional development as the concept related to teaching in these innovative spaces.

The physical amenities most often used in the EPIC classrooms were the writable wall and the flexible furniture. Even given the “blind spot” in room 4041 and the difficulty in seeing across the room in room 4046 (the largest classroom) instructors still felt that the writable wall space was an important aspect to the room that contributed to the innovative feel of the classroom. All of the research subjects cited the flexibility of
the space—from the movable podium to movable tables and chairs as an additional amenity that impacted the innovative feel to the classrooms. The technology available in the classroom was another amenity that was discussed by all seven research subjects. The technology in the classrooms was described as “restrictive”, “challenging”, “easier to do multiple things at once” and “facilitates better use of technology.” There appears to be a wide range of experiences and perceptions of the technology available in the EPIC classrooms. The aspects most often utilized by the instructors were the wireless access and the projector screens (sometimes singular and sometimes multiple) used for presentations and videos. Although two of the research participants spoke of recording student presentations in the classroom, I did not observe that behavior from either research subject. Despite the flexibility of the furniture and the multiple projection points in the classroom, the “front” of the classroom seemed to be established wherever the instructor spent the majority of his/her time. Even though the podium was movable, instructors only moved it when there were technology issues or when, in the case of Participant 002, she was looking for a location other than near the projector screen.

I believe that being outside of a more traditional classroom space—likely with fixed seating and a defined front of the classroom, encouraged the instructors to step outside of their comfort zones and think creatively about their course content and how best to deliver that content. The majority of research participants cited the physical classroom space as a reason for teaching in the EPIC classrooms. Given the importance of the flexibility in these spaces, it is reasonable to assume that adding more flexible spaces across the campus would increase the number of instructors and students impacted by the active learning classrooms. All of the research subjects employed similar active
learning instructional strategies in their classes. Interactive lectures, small and large group discussions, and team based learning were observed repeatedly throughout the 12 observations that I conducted. A high level of student to student interaction is to be expected given the pod set up in each of the classrooms. Pods in the classrooms (with the exception of room 4041) were set up with two rectangular tables per pod with seating for four to six students.

The research participants struggled with the question “how has teaching in an EPIC classroom impacted your professional development?” Some instructors were able to answer this question immediately, while others needed to think about their answers for a period of time. Even after considering the question, two professors were not sure they had “good” answers. One of the realizations that I had from this question is that professional development is a very personal experience and there is no one “right” path for instructors teaching in EPIC classrooms or more traditional spaces.

Participant 004 connected her professional development to the end of semester meetings for EPIC instructors. At these meetings, she listens to what other instructors have done and uses those ideas to further research pedagogical techniques and activities. She also felt that by teaching in the EPIC classrooms that “it’s caused me to look at my content and figure out what is the best way to transmit that to students given the tools that I have at my disposal.” Participant 004 was the only research subject to mention the end of semester gathering where EPIC instructors come together to debrief the semester. Other instructors, though, were not certain that teaching in the EPIC classrooms impacted their professional development in any meaningful way. Participant 003 felt that his development was not dependent on teaching in the classroom, rather the classroom itself
forced him to transition from “sage on the stage” to “guide on the side” more quickly than he may have in a traditional classroom. Participant 003 felt that his transition would take place regardless of whether or not he taught in the EPIC space.

Despite the struggle to answer my interview questions regarding professional development and the EPIC classrooms, I believe that each of the instructors engages in professional development when they re-conceptualize an instructional strategy or learning activity to use in the classroom. Because this professional development is so individual, it seemed difficult for the research subjects to articulate their perceived connections to teaching in EPIC classrooms with professional development.

The Center for Faculty Innovation (CFI) and the Center for Instructional Technology (CIT) along with the operational staff of the Student Success Center (SSC) offer opportunities such as a “meet your classroom” orientation, a debriefing session at the end of each semester, and the ability to participate in consultations with CFI or CIT consultants to work through questions about pedagogy or technology in the EPIC classrooms. Given that only one of the research participants discussed these opportunities, it is reasonable to assume that these professional development opportunities are currently underutilized. This is one area where the CFI, the CIT, and the SSC staff may be able to improve on by finding out what kinds of assistance EPIC instructors would be most likely to utilize.

These data point toward a relationship between experiential learning theory, constructivism, and the instructional strategies and amenities used in the EPIC classrooms. Kolb (1984) refers to experiential learning as being “transformed” through
experience. Tied closely, in this instance, to Kolb’s experiential learning theory is constructivism—whereby the research subjects in this study were able to experiment in these EPIC classrooms and conceptualize different ways of teaching particular subject matter. This experimentation produced two possible results:

- Instructional strategies are successful in an active learning classroom
- Instructional strategies are successful in an active learning classroom and are modified for use in a traditional classroom

The experimentation and construction of additional instructional strategies provided a professional development opportunity for the instructors teaching in the EPIC classrooms. This type of professional development was individualized but forced the instructor to rely on his/her own ability to plan, design, analyze and interpret instructional strategies and their level of success in an active learning classroom. Two research participants identified activities that were conceived because of the EPIC classrooms but that would be modified for use in a traditional classroom.

During the analysis phase of this research study, I realized that I should have asked each of the research participants an additional interview question: What types of professional development would you like to see put in place for instructors teaching in EPIC spaces? This question may have helped the research subjects to consider how their own professional development is linked to the EPIC spaces and to articulate any gaps that they perceive in the usage of the EPIC classrooms.
Limitations

I identified several limitations in this study. First, due to the winter weather in January and February, I was not able to complete two scheduled in-class observations. Second, the period of time in which I was able to collect data was relatively short (January, February and early March) and done while I also worked at a full-time job. Third, the sample size was small and it was necessary for me to use both new and experienced EPIC professors. Fourth, I should have included interviews members of multiple key informants—namely members of the EPIC steering committee to incorporate with Megan Driver’s background information. Lastly, I conducted this research alone and therefore collected and coded the interview and observational data myself, which means that I may have missed an emergent theme or other key piece of information.

Implications for Practice

One of the most obvious implications for practice with the EPIC classrooms is to create more EPIC-like spaces throughout the campus. These spaces appear to be popular with professors and students alike and increasing their availability throughout campus would allow for more instructors and students to use and experiment with the spaces. There are two challenges, however, with this notion. First, considerable financial, technological, and personnel resources would need to be acquired. Existing rooms would need to be retrofitted with additional technology, walls would need to be painted with whiteboard paint, and flexible furniture would need to be purchased. With the added technology in the classrooms would come an added responsibility of providing technology support, which requires additional personnel dedicated to the technology in
these classrooms. Additional logistical support would also be necessary in order to rearrange the furniture between classes, clean the walls and ensure that the room was ready for the next class. As the majority of classrooms on campus are already equipped with wireless access, an instructor computer station, and a projector screen, one alternative might be to paint existing classroom walls with whiteboard paint and add furniture that is on casters and could be more easily re-arranged in the classrooms.

The second challenge with creating more EPIC-like spaces throughout the campus is more abstract. While it is possible to teach in an active learning classroom and not use any active learning techniques, that is not the purpose of the classroom. Currently, professors apply to teach in EPIC classrooms and these applications are vetted by a steering committee of instructional faculty. Creating more active learning spaces on campus begs the question: Who gets to teach in these classes?

Both of the challenges discussed above require considerable thought and planning moving forward as there will require a great investment of financial, technological and human resources, but also a culture that embraces active learning must be adopted in order to ensure that these valuable resources are maximized for the benefit of students and instructors.

Opportunities exist for formalized faculty development for instructional faculty teaching in active learning classrooms. First, given that the technology in the classroom appears to be the biggest challenge to teaching the EPIC classrooms, I recommend further training for all EPIC instructors on the available technology in the classroom and how that technology is applied to specific pedagogical practices. I believe that this training
would provide a significant opportunity for faculty development in the areas of technology skill acquisition and pedagogical practice. This training presents a unique opportunity for the Center for Faculty Innovation (the department responsible for faculty development) and the Center for Instructional Technology (the department responsible for incorporating technology into instruction) to combine their skills and present programming on pedagogical practices and the integration of technology specific to the EPIC classrooms. Second, the creation of a community of practice for current instructors may be helpful. These learning communities would allow instructors to work across disciplines to brainstorm instructional strategies and troubleshoot problems encountered in the classrooms. These learning communities may also produce independent research opportunities to further advance the understanding of the impact of active learning classrooms. Third, opportunities for individual consultations both for instructional strategies and for uses of technology with the instruction would allow for individual instructors to receive feedback on specific content delivery strategies. Lastly, because teaching in the EPIC classrooms is not a permanent option for any instructor, I believe that there is an opportunity for programming to transition faculty back into a more traditional classroom space. This programming would allow for discussion on ways to use the strategies from the EPIC classroom in a traditional classroom.

Fourth, faculty development programming can delve into the dichotomies represented by Bowen’s (2012) *Teaching Naked* and the concept of integrating technology into the classroom. I believe that a danger with classrooms like the EPIC rooms that have so much technology in them is the notion that the technology must be used or it is somehow wasted. Teaching with and without technology are useful
strategies in specific contexts and can contribute to significant, deep learning experiences. Professional development opportunities can facilitate discussion between colleagues on the most appropriate teaching strategies to use in specific situations and can allow instructors to consider classroom instructional strategies both with and without technology.

**Recommendations for Future Study**

During this research, I identified areas of future study that would contribute to the literature on active learning classrooms, instructional strategies and faculty development and better our understanding on classroom space and instructional strategies:

- Conduct a longitudinal study that follows the same professors from the first semester of teaching in EPIC classrooms through their last semester for teaching in the classrooms. Capture data through interviews, observations, and student data via focus groups and/or surveys on their perceptions of the space and the instructional strategies used within the spaces. Include a team of researchers for this project that can better gather large swaths of data and analyze it.

- Research the impact of active learning classrooms on introverted instructors and students. What techniques can instructors and students who self-identify as “introverted” use to protect themselves in such an engaged environment?

- Create a faculty community of EPIC instructors who work together over a semester or year to identify best practices in the EPIC classrooms based on their own teaching experience, anecdotal evidence from other (previous or current) instructors and scholarly literature.
These recommendations for future research may help shed light on best practices for active, experiential learning in innovative spaces.

**Conclusions**

The key findings from this research indicate that instructors are using multiple instructional strategies and taking advantage of the flexible furniture, writable walls, and technology offered in the innovative classrooms spaces. The “blank slate” environment offered to instructors in the EPIC classrooms provides an opportunity that cannot be found in more restrictive traditional classroom environment. It appears that merely engaging with a fresh, new space has, in some cases, encouraged professors to reconsider teaching strategies and experiment with different types of pedagogy in the classroom.

To some degree, teaching in these innovative spaces also affects the instructor’s professional development; however this concept is highly personalized among individual instructors. Future studies should be conducted longitudinally in order to better understand the instructors use of the EPIC space over time and how their instructional strategies may evolve over prolonged used of the space. Student data should also be collected in order to gauge student reactions to the physical classroom space and instructional strategies. There appear to be some challenges with the use of technology in the EPIC classrooms which can be addressed through more formalized faculty development programming opportunities.

The seven instructors from this study provided me rich research experiences in pedagogy and innovative classroom spaces. My initial assumption was that active learning strategies can be done in any type of classroom environment; while I still believe
that active learning techniques can be used in many types of environments, I have come
to appreciate the unique environment of the EPIC classrooms which allows the instructor
to create a space that interacts with the pedagogies used and the needs of the students.
Appendix A

James Madison University
Human Research Review Request

FOR IRB USE ONLY:

Exempt: □ Protocol Number: 1st Review: ______ Reviewer:__________________
Expedited: □ IRB: __________ 2nd Review: ______ Reviewer:__________________
Full Board: □ Received: ______ 3rd Review: ______

<table>
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<tr>
<th>Project Title:</th>
<th>As EPIC Teaching Experience: A Study of Pedagogically Innovative Classrooms</th>
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<td>Project Dates:</td>
<td>From: 11/01/2015 To: 05/15/2016 MM/DD/YY MM/DD/YY</td>
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<tr>
<td>Minimum # of Participants:</td>
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<td>Maximum # of Participants:</td>
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| Funding: | External Funding: Yes: □ No: X If yes, Sponsor:__________________
Internal Funding: Yes: □ No: X If yes, Sponsor:__________________
Independently: Yes: □ No: X |
| Incentives: | Will monetary incentives be offered? Yes: □ No: X If yes: How much per recipient? ______ In what form? ______ |

Responsible Researcher(s): Tiffany T. Bunting
E-mail Address: rnuttt@jmu.edu
Telephone: (540) 383-9180
Department: Adult Education/Human Resource Development
Address (MSC): 4924
Please Select: □ Student □ Undergraduate Student □ Graduate Student

Research Advisor: Dr. Noorioh Brautner
E-mail Address: brautner@jmu.edu
Telephone: (540) 581-4530
Department: Learning/Technology and Leadership Education
Address (MSC): 6911

Investigator: Please respond to the question below. The IRB will utilize your responses to evaluate your protocol submission.

1. X YES □ NO Does the James Madison University Institutional Review Board define the project as research?
   The James Madison University IRB defines “research” as a “systematic investigation designed to develop or contribute to generalizable knowledge.” All research involving human participants conducted by James Madison University faculty and staff and students is subject to IRB review.

2. X YES □ NO Are the human participants in your study living individuals?
   “Individuals” whose physical or behavioral characteristics and responses are the object of study in a research project. Under the federal regulations, human subjects are defined as: living individual(s) about whom an investigator conducting research obtains:
   (1) data through intervention or interaction with the individual, or
   (2) identifiable private information.

3. X YES □ NO Will you obtain data through intervention or interaction with those individuals?
   “Intervention” includes both physical procedures by which data are gathered (e.g., measurement of heart rate or venipuncture) and manipulations of the participant or the participant's environment that are performed for research purposes. “Interaction” includes communication or interpersonal contact between the investigator and participant (e.g., surveying or interviewing).
4. **YES** ☐ **NO** Will you obtain identifiable private information about these individuals?

Private information includes information about an individual that that is not widely known or can reasonably be expected to remain private or unknown to others. If you answer "yes," you must ensure the identifiable private information will be protected.

5. **YES** ☐ **NO** Does the study present more than minimal risk to the participants?

Minimal risk means that the risk of harm to participants is reasonable in light of the potential benefits that the research may yield for the advancement of knowledge or the improvement of health or other well-being.

**CERTIFICATIONS:**

To ensure that all research is conducted in compliance with the Office of Research Integrity (ORI), the Office of Human Research Protection (OHRP), and institutional policies and guidelines, researchers must complete the Conflict of Interest and Research Integrity Training. This training is required for all researchers involved in research activities at James Madison University. The training can be accessed at [http://www.jmu.edu/researchintegrity/ethics/retraining.shtml](http://www.jmu.edu/researchintegrity/ethics/retraining.shtml).

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<tr>
<th>Name of Researcher(s) and Research Advisor</th>
<th>Training Completion Date</th>
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<tbody>
<tr>
<td>Tiffany T. Ronion</td>
<td>02/01/2015</td>
</tr>
<tr>
<td>Dr. Noorjehan Braidmier</td>
<td>09/24/2013</td>
</tr>
</tbody>
</table>

For additional training materials or access to a Spanish version, visit the National Institutes of Health: Protecting Human Research Participants (PHIP). Contact ORI at 540-568-9808 or information@odu.edu.

By signing below, the Responsible Researcher(s) and the Faculty Advisor (if applicable), certify that he/she is familiar with the ethical guidelines and regulations regarding the protection of human research participants from research risks. In addition, I hereby agree to abide by all sponsor and university policies and procedures in conducting the research. I further certify that I have completed training requiring that all participants research ethics within the last three years.

**Tiffany T. Ronion**
Principal Investigator Signature
Date

**Faculty Advisor Signature**
Date

Submit an electronic version (in a Word Document) of your ENTIRE protocol to research@odu.edu.

Provide a SIGNED hard copy of the Research Review Request Form to:
Office of Research Integrity, MSC 5730, 501 University Boulevard, Blue Ridge Hall, Third Floor, Room 109

[10/09/15]
Purpose and Objectives

Please provide a brief summary of the study. Include the purpose, research questions, and hypotheses to be evaluated. (Limit to one page)

This qualitative study examines the pedagogical strategies of five professors teaching classes at James Madison University. The classes are held in the university’s EPIC (enhancing pedagogy through innovative classroom) classroom spaces. Through interviews and in-class observations, I will examine the intersection of the professors’ use of the innovative classroom spaces with their chosen learning strategies. The purpose of the study is to better understand how the physical classroom space and the amenities offered in the space complement the pedagogies used in the classroom to better enhance the student learning experience.

The research questions that I anticipate the study answering are:

- How does the physical space, and the amenities (technology, furniture, writable walls) affect the learning strategies used in the course?
- What pedagogies or learning strategies are used in the EPIC spaces versus pedagogies and learning strategies used in a traditional classroom?
- How do the professors believe student learning experiences are enriched by using the EPIC spaces?

Procedures/Research Design/Methodology/Timeframe

Describe your participants. From whom and how will potential participants be identified (e.g., class list, JMU bulk email request, etc.)?

The population to be examined in this study is professors who teach in EPIC [enhancing pedagogy through innovative classrooms] classrooms at James Madison University. Professors who wish to teach in the EPIC spaces apply prior to the semester in which they wish to teach and are chosen by a selection committee. Potential participants will be identified by working with the EPIC steering committee to obtain the names of professors who were accepted to teach in the EPIC classrooms for spring 2016.

Describe your recruitment strategy. How will subjects be recruited once they are identified (e.g., mail, phone, classroom presentation)? Include copies of recruitment letters, flyers, or advertisements.

Upon IRB approval, a survey [See attached] will be sent to professors who are selected to teach in the EPIC classrooms for the spring 2016 semester to gauge their willingness to participate in this study. Of those who are willing to participate in the study, approximately 5 professors will be selected to participate in the research.

Describe the design and methodology, including all statistics, in DETAIL. What exactly will be done to the subjects? If applicable, please describe what will happen if a subject declines to be audio or video taped.

The data collected from this research study will be qualitative in nature. Each research be interviewed one to two times in late fall semester 2015/early spring semester 2016. The interviews will be audio-taped. Each research participant will be observed in class two times—once at the beginning of the spring 2016 semester and once in the middle of the semester. The observations will note the movement of the professor in the classroom during class time. Movements will be recorded on a map of the classroom and notations will be made of how often the professor moves throughout the classroom while teaching. Notations will also be made regarding the arrangement of the furniture in the classroom and the professor’s use of (or lack of use) of the available technology in the classroom. No photographs or videotaping will take place during the classroom observations.

The assistant director of the Student Success Center will also be interviewed and asked questions about the use of the classrooms to determine all of the available amenities that the classrooms have to offer.

If a subject declines to be audio-taped, they will be not be able to participate in the study. Due to the qualitative nature of this study, it is imperative that the interviews are audio-taped so that the researcher can accurately transcribe and code any emergent themes that occur between the research subjects. Participation in this research study is conditional on agreeing to be audio-taped during the interview process.
Emphasize possible risks and protection of subjects.

The investigators do not perceive more than minimal risks from your involvement in this study (that is, no risks beyond the risks associated with everyday life).

What are the potential benefits to participation and the research as a whole?

On a micro level, research participants have the opportunity to learn about the way that they teach in innovative classrooms and to reflect on the pedagogies that they use while instructing students. Other professors at James Madison University also have the potential to learn from the way that professors use the EPIC classrooms thereby increasing the demand to teach in the Student Success Center.

On a macro level, the research has the potential to contribute to scholarly literature on classroom design, active learning pedagogies, and enriched student experiences.

Will data be collected from any of the following populations?

- ___ prisoners (under 18 years of age); Specify age: ________________________
- ___ pregnant women, fetuses, or embryos
- ___ cognitively impaired persons
- ___ other protected or potentially vulnerable population
- ___ Not applicable

Where will research be conducted? [Be specific; if research is being conducted off of JMU’s campus a site letter of permission will be needed]

The research will be conducted in the EPIC classrooms of the Student Success Center at James Madison University in Harrisonburg, VA.

Will deception be used? If yes, provide the rationale for the deception. Also, please provide an explanation of how you plan to debrief the subjects regarding the deception at the end of the study.

No deception will be used in this study.

What is the timeline frame of the study? (List the dates you plan on collecting data. This cannot be more than a year, and you cannot start conducting research until you get IRB approval)

Interviews with the Assistant Director of Operations at the Student Success Center and with instructional faculty teaching in the EPIC classrooms in the late fall of 2015, pending IRB approval. Data will be collected via two in-class observations early in the spring 2016 semester. Follow-up interviews will be conducted after the second in-class observation.

Data Analysis
For more information on data security, please see:
http://www.jmu.edu/researchintegrity/irb/irbidatasecurity.shtml

How will data be analyzed?

Interview data will be audio recorded and transcribed by the researcher. After all of the interviews are complete, the data will be analyzed for emergent themes and to look for similarities and differences between the instructional faculty members.

Photographs will be taken of the classrooms to show the arrangement. These photographs will not feature any humans—only the arrangement of the classroom furniture.

Observational data will be collected via mapping during the class time. A map of the classroom will be used to mark the professor’s physical location in 5 minute increments throughout the class time.

Notations will also be made regarding the use of the classroom furniture (how it is arranged) and the
technology that is available in the classroom. In order to protect the confidentiality of the participants, personas will be created for each of the participants and those participants will be used to report the data.

How will you capture or create data? Physical (e.g. paper, tape recording)? Electronic (e.g. computer, mobile device, digital recording)?

Interview data will be collected by audio recording using a digital device. Photographs will be taken with a digital camera and observational data will be collected using markings on a paper map of the classroom.

Do you anticipate transferring your data from a physical/analog format to a digital format? If so, how? (e.g. paper that is scanned, data inputted into the computer from paper, digital photos of physical/analog data, digitizing audio or video recording?)

I anticipate transferring audio data to paper (interview transcription), taking digital photos the classroom space and furniture arrangement, and scanning observational data from paper to a PDF file that can be incorporated into the final research analysis.

How and where will data be secured/stored? (e.g. a single computer or laptop; across multiple computers; or computing devices of IMU faculty, staff or students; across multiple computers both at IMU and outside of IMU?) If subjects are being audio and/or video-taped, file encryption is highly recommended. If signed consent forms will be obtained, please describe how these forms will be stored separately and securely from study data.

Data will be stored on a single, IMU issued computer. Signed data consent forms will be stored in a locked filing cabinet at my home in Groton, CT. Audio recordings will be stored on the IMU issued computer which is locked through two security layers and encrypted. The audio files will be transferred from the recording device to the encrypted computer immediately after the interview is over and deleted from the recording device.

Who will have access to data? (e.g. just me, me and other IMU researchers (faculty, staff, or students); or me and other non-IMU researchers?)

I will have access to the data and my research adviser, Dr. Brantmeier, may have access to the data in order to answer questions that I may have during coding.

If others will have access to data, how will data be securely shared?

Data will be stored in person (e.g. kept on the original computer and shared in person).

Will you keep data after the project ends? (a. yes, all data; b. yes, but only de-identified data; c. no) If data is being destroyed, when will it be destroyed, and how? Who will destroy the data?

Data will be kept until I determine if I am going to continue the research with a Ph.D. dissertation.

Reporting Procedures
Who is the audience to be reached in the report of the study?

My thesis committee is:

Dr. Haepoehn Brantmeier (thesis advisor), Dr. Diane Winkv, and Dr. Gun Meier. Instructional faculty, faculty developers, scholars studying pedagogy and classroom design are all also welcome to review this research.

How will you present the results of the research? (If submitting as exempt, research cannot be published or publicly presented outside of the classroom. Also, the researcher cannot collect any identifiable information from the subjects to qualify as exempt.)

The results of the research will be presented to my thesis committee and I will apply to submit my research to James Madison University's Graduate Student symposium.
How will feedback be provided to subjects?

All subjects will be provided the opportunity to review the research after it is completed. The research participants will be emailed and asked if they wish to review their lives after my defense is complete.

Experience of the Researcher (and advisor, if student):

Please provide a paragraph describing the prior relevant experience of the researcher, advisor (if applicable), and/or consultants. If you are a student researcher, please state if this is your first study. Also, please confirm that your research advisor will be guiding you through this study.

Tiffany T. Runion holds a Bachelor of Arts degree in English from the University of Mary Washington in Fredericksburg, VA. Prior to enrolling in the Adult Education/Human Resource Development program, Tiffany worked in the human service field for nearly 15 years as an advocate for domestic violence survivors, and as a housing provider for low income families in the Harrisonburg/Rockingham County area. During that time, she designed interventions and analyzed program evaluations pertaining to the programs that she managed and utilized the survey results to further enhance programming to incoming clients. As a graduate student, Tiffany has taken the following select courses: Foundations of Human Resource Development, Performance Analysis and Needs Assessment, and Research Methods and Inquiry in AHRD. Most recently, Tiffany has assumed a role at the Center for Faculty Innovation where she manages the logistics, operations, and data collection for various programs related to pedagogy, scholarship, and career planning. This is Tiffany’s first research project at JMU.

Dr. Noorie Kelsey Brantmeier has a Ph.D. in Adult Education and Human Resource Studies with a specialization in research methods from Colorado State University. She has a master’s degree in social work from Washington University in St. Louis where she conducted research on social and economic development in Native American communities. Dr. Brantmeier has been a principal investigator, co-principal investigator, and/or research coordinator on studies related to the measurement of student attitudes regarding diversity in higher education, youth civic engagement, and adolescent attitudes toward violence. She holds the rank of Graduate Faculty at JMU and teaches research methods courses at both the master’s and doctoral levels.

Past and current research methods courses taught include:

PSY 840: Qualitative and Mixed Research Methods
AHRD/EDUC 630: Research Methods & Inquiry
   AHRD 680/700: Reading & Research/Thesis
   AHRD 680: Needs Assessment
Consent to Participate in Research

Identification of Investigators & Purpose of Study
You are being asked to participate in a research study conducted by Tiffany T. Runion from James Madison University. The purpose of this study is to interview and observe professors teaching in the EPIC classrooms at James Madison University. The interviews and observations will record the professors’ intended use of pedagogically innovative classrooms and compare the intended use of the classrooms with the actual use of the classrooms throughout the spring 2016 semester. This study will contribute to the researcher’s completion of her master’s thesis.

Research Procedures
Should you decide to participate in this research study, you will be asked to sign this consent form once all your questions have been answered to your satisfaction. This study consists of (an) interview(s) and observations that will be administered to individual participants in the EPIC classrooms at the Student Success Center of James Madison University, Harrisonburg, VA. You will be asked to provide answers to a series of questions related to your intended and actual use of active learning pedagogies in innovative classroom spaces. You will be audio taped during the interview session(s).

Time Required
Participation in this study will require 60 minutes of your time for the initial interview. Observations will take place over two class periods in the spring 2016 semester; however, no direct contact between the researcher and you is necessary during the class periods. A subsequent follow up interview requiring up to 60 minutes of your time may be necessary, but not required to participate in the study. The overall estimated time of participation is up to two hours of interview time and two class periods of observation.

Risks
The investigator does not perceive more than minimal risks from your involvement in this study (that is, no risks beyond the risks associated with everyday life).

Benefits
Potential benefits from participation in this study include the following:
Direct benefits to the participant: A chance to reflect on the pedagogical choices and uses of the EPIC classrooms.

Additional benefits of the research: To educate other instructional faculty on the JMU campus about the abilities and uses of the EPIC classrooms and to contribute to the scholarly literature on innovative classroom design and implementation fidelity in higher education.

Confidentiality
The results of this research will be presented to a Research Review Committee comprised of faculty members from the College of Education. While individual survey responses are confidentially obtained and recorded online through the Qualtrics software, data is kept in the strictest confidence. Identifiable data will be collected and confidentially held by the researcher; however, no identifiable responses will be presented in the final form of this study. All data will be stored in a secure location only accessible to the researcher. The researcher retains the right to use and publish non-identifiable data. Final aggregate results will be made available to participants upon request.
Participation & Withdrawal

Your participation is entirely voluntary. You are free to choose not to participate. Should you choose to participate, you can withdraw at any time without consequences of any kind.

Questions about the Study

If you have questions or concerns during the time of your participation in this study, or after its completion or you would like to receive a copy of the final aggregate results of this study, please contact:

Tiffany T. Runion, Researcher
Learning Technology & Leadership Education
James Madison University
runion@jmu.edu

Dr. Navjehon Shumimau, Advisor
Learning Technology & Leadership Education
James Madison University
Telephone: (540) 568-4530
runion@jmu.edu

Questions about Your Rights as a Research Subject

Dr. David Cockley
Chair, Institutional Review Board
James Madison University
(540) 568-2534
cockleyd@jmu.edu

Giving of Consent

I have read this consent form and I understand what is being requested of me as a participant in this study. I freely consent to participate. I have been given satisfactory answers to any questions. The investigator provided me with a copy of this form. I certify that I am at least 18 years of age.

☐ I give consent to be audio taped during my interview. ___ (initials)

Name of Participant (Printed) ___________________________

Name of Participant (Signed) ___________________________ Date __________

Name of Researcher (Signed) ___________________________ Date __________
Survey Questions (to determine potential research subject participation in the study)

Active Survey Link: http://jmc.co1.qualtrics.com/SE/?SID=SE_1891NOKFw2C30W

Survey Questions:
The purpose of this survey is to identify professors who teach in EPIC classrooms that are willing to participate in a research study. The study seeks to discover the ways in which you use the EPIC classroom to meet the course objectives and how the ways that you use the classroom may change throughout the semester. Please take a minute to fill out the survey questions. If you are willing to participate in the research, I will be in contact with you soon.

Are you willing to participate in a research study that involves one to two interviews and two in class observations during the Spring 2016 semester? (yes or no)

Confidential Screening Survey (Qualtrics)

Your Name: 
E-ID: 
College: (drop down menu)
Department: (drop down menu)
Rank: 
Number of years teaching at JMU: 
Number of years teaching at other institutions:

Please answer the following questions about the class you are teaching in EPIC in Spring 2016:
Name of Course: 
Course Level: (e.g., 200)
Is the course an undergraduate or graduate course?
Have you ever taught this course in a traditional classroom?
How many sections of the course are you teaching?
If teaching multiple sections of the course are all sections taught in an EPIC classroom?

Are you willing to be interviewed (and audio recorded) in order to discuss your intended uses of the EPIC classroom? (You will be asked to sign an informed consent at the end of the interview.) (yes or no)

Are you willing to be observed in your class two times during the semester? (The intended observations will occur once at the beginning of the semester and once about halfway through the semester.) (yes or no)

Are you willing to share your syllabus with the researcher? (yes or no)

Interview Questions (pre-observation)

What types of learning strategies do you anticipate using in the space?

How do you envision using these strategies differently in an EPIC classroom?

How are these pedagogies similar to or different from the way you’ve taught this class in a traditional classroom?
What physical amenities are available in the EPIC classrooms that are not generally present in a traditional classroom?

How do you anticipate using these amenities?

How do you believe your students' learning is enhanced by using an EPIC classroom?

What are your personal objectives for the course?

**Interview Follow Up Questions (Post Observation)**

What challenges have you experienced with the physical classroom space?

How have you overcome these challenges?

In what ways has this classroom space helped you to accomplish your personal objectives for this course?

**EPIC Assistant Operations Director, Megan Driver interview questions**

What are the innovative amenities available in the classroom? (e.g. seating, technology, etc.)

How many really innovative or interesting things have you seen done with these spaces?

What are some of the most interesting activities that you've seen happen here?
Appendix B—Qualtrics Survey Questions

Q7 Are you willing to participate in a research study that involves one to two interviews and two in class observations during the spring 2016 semester?

☐ Yes
☐ No

Q6 Please fill in the following information:

- Your Name
- E-ID
- Number of years teaching at JMU
- Number of years teaching at other institutions

Q6 Please select your college:

☐ College of Arts & Letters
☐ College of Business
☐ College of Education
☐ College of Health and Behavioral Studies
☐ College of Integrated Science and Engineering
☐ College of Science & Mathematics
☐ College of Visual and Performing Arts
☐ Library and Educational Technologies
☐ Student Affairs and University Planning
☐ The Graduate School
☐ University Programs
☐ Other (please indicate): ____________________
Q13 Please Indicate your department

- Accounting
- Art & Art History
- Assessment & Research Studies
- Biology
- Chemistry & Biochemistry
- Communication Sciences & Disorders
- Communication Studies
- Computer Information Systems & Operations Management
- Computer Science
- Early, Elementary & Reading Education
- Economics
- Engineering
- English
- Exceptional Education
- Finance & Business Law
- Foreign Languages, Literature, & Cultures
- Geology & Environmental Science
- Graduate Psychology
- Health Sciences
- History
- Hospitality & Tourism Management
- Institute for Innovation in Health & Human Services
- Integrated Science & Technology
- Interdisciplinary Liberal Studies
- International Business
- Justice Studies
- Kinesiology
- Learning, Technology & Leadership Education
- Libraries & Educational Technologies
- Management
- Marketing
- Mathematics & Statistics
- Media Arts & Design
- Middle, Secondary & Mathematics Education
- Military Science
- Music
- Nursing
- Philosophy & Religion
Q8 Please answer the following questions about the class you are teaching in EPIC in spring 2016:

Name of Course (e.g. Foundations to Human Resource Development)
Course Level (e.g. 200 level)
Is the course an undergraduate or graduate course?
How many sections of the course are you teaching?
If teaching multiple sections of the course, are all sections taught in an EPIC classroom?

Q10 Are you willing to be interviewed (and audio recorded) in order to discuss your intended uses of the EPIC classroom? (You will be asked to sign an informed consent at the beginning of the interview.)

☐ Yes
☐ No
Q12 Are you willing to be observed in your class two times during the semester? (The intended observations will occur once at the beginning of the semester and once about halfway through the semester.)

☐ Yes
☐ No

Q14 Are you willing to share your syllabus with the researcher?

☐ Yes
☐ No
Appendix C—Initial Interview Questions

What types of learning strategies do you anticipate using in the space?

How do you envision using these strategies differently in an EPIC classroom?

How are these pedagogies similar to or different from the way you’ve taught this class in a traditional classroom?

What physical amenities are available in the EPIC classrooms that are not generally present in a traditional classroom?

How do you anticipate using these amenities?

What are your personal objectives for the course?
### Appendix D—Observation Form

**Name:**

**Classroom:**

**Date:**

**Time:**

<table>
<thead>
<tr>
<th>Behavior</th>
<th>15 minutes</th>
<th>30 minutes</th>
<th>45 minutes</th>
<th>60 minutes</th>
<th>75 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Professor clearly identifies “front” or “back” of classroom</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Professor walks throughout classroom during instruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Professor walks throughout classroom and provides feedback</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Professor interacts with groups or individuals during class time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Professor uses technology offered in the classroom</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Professor has difficulty with a technology in the classroom and requires assistance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Professor has difficulty with a technology in the classroom and does not require assistance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Instructor is at the “front” of the classroom and stationary during presentation of materials and instruction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
Appendix E—Institutional Research Board Addendum

In accordance with federal regulations, the IRB must review and approve all changes to previously approved research prior to implementation. Please complete this form to describe the proposed changes to your study.

IRB Protocol #: 16-01167

Project Title: An EPIC Teaching Experience: A Study of Pedagogically Innovative Classrooms

Name of Researcher(s): Tiffany T. Runion

Faculty Advisor (If applicable): Dr. Noorie Brantmeier

1. Provide an abstract of findings or summary of progress to date:
   To date, I have conducted 5 out of 9 pre-observation interviews and 8 of 14 in-class observations. I need still need to complete 3 more pre-observation interviews, 8 in-class interviews and the post-observation interviews. The pre-observations and in-class observations so far have given me several new post-observation interview questions that I would like to ask. The updated interview questions are listed below.

2. Type of addendum request:
   - Changes in personnel
   - Data collection tools/procedures
   - Project goals
   - Informed consent process/forms

3. Provide a brief description of changes and rationale:
   The updated interview questions are:
   - What is your preferred method of learning new material?
   - How has your preferred method of learning new material impacted the learning strategies you use in the EPIC classroom?
   - Why did you want to teach in the EPIC classroom?
   - How does teaching in EPIC impact your professional development?
   - What have you learned about yourself as an educator by teaching in the EPIC classroom?

4. Attach amended material, as applicable (highlight all changes):

   n/a

Certification:
I certify that the information supplied on this form is complete and accurate and that no procedures other than those disclosed on this form will be used in this protocol. I will promptly report to the IRB all research-related accidents, injuries, complaints, problems, or breaches of

Submit electronic copy to cmichirb@jmu.edu and a “signed” hard copy to the
Office of Research Integrity, MSC 573A
601 University Boulevard, Third Floor, Room # 342
confidentiality. I will report any significant new findings that may affect the risks and benefits to the subjects and other participants in writing to the research participants and to the IRB.

Signature: [Signature] Date: 2/12/16
Signature: Date: 
Signature: Date: 
Signature: Date: 
Faculty Advisor Signature: [Signature] Date: 2/12/16

Submit electronic copy to researchintegrity@imu.edu and a "signed" hard copy to the Office of Research Integrity, MSC 5788
631 University Boulevard, Third Floor, Room 342
Appendix F—Second Interview Follow Up Questions

What is your preferred method of learning new material?

How has your preferred method of learning new material impacted the learning strategies you use in your EPIC classroom?

Why did you want to teach in the EPIC classroom?

How does teaching in EPIC impact your professional development?

What have you learned about yourself as an educator by teaching in the EPIC classrooms?
### Key Terms and Definitions

<table>
<thead>
<tr>
<th>Key Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>active learning</td>
<td>Learning that provides students with the opportunity to be engaged with the material through reading, writing, discussions, case study activities and case study activities. Students are involved in higher order thinking such as analysis, synthesis and evaluation. Learning that provides students with (Myers &amp; Jones, 1993 and Bonswell &amp; Eison, 1991)</td>
</tr>
<tr>
<td>classroom design</td>
<td>Considerations for classroom design include “size and shape, furniture and seating arrangement, modern technology arrangement, interior lighting, color selection, thermal condition, and noise level” (Lei, 2010).</td>
</tr>
<tr>
<td>integrated course design</td>
<td>“The basic idea behind ICD is that, rather than simply develop a list of topics in a course and then provide students with lots of information about each topic, we need to design our courses in a way that is learning-centered, systematic, and integrated. If we can do this, students will respond by becoming more engaged in the work of learning and will succeed in achieving more important kinds of learning.” (Fink, 2007, p. 13)</td>
</tr>
<tr>
<td>instructional strategies</td>
<td>Consist of a series of decisions and plans and a variety of related teaching activities that are aimed at achieving intended outcomes (Dick, Carey, &amp; Carey, 2001)</td>
</tr>
<tr>
<td>Experiential learning</td>
<td>“The process whereby knowledge is created through the transformation of experience” (Kolb, 1984 p. 41).</td>
</tr>
</tbody>
</table>

---

**Table 1**

*Appendix G: Table 1*
Constructivism
### Appendix H: Table 2

Table 2

*Kolb’s Learning Styles and Processes*

<table>
<thead>
<tr>
<th>Learning Style</th>
<th>Dominant Learning</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diverging Style</strong></td>
<td>Concrete experience</td>
<td>View concrete situations from many different points of view’ performs well in brainstorming sessions, interested in people; are imaginative, emotional, have broad cultural interests and specialize in the arts; prefer to work in groups; listen with an open mind and are receptive to personalized feedback.</td>
</tr>
<tr>
<td></td>
<td>Reflective observation</td>
<td></td>
</tr>
<tr>
<td><strong>Assimilating style</strong></td>
<td>Abstract Conceptualization</td>
<td>Understand range of information and put the information in succinct, logical form. Interested in ideas and abstract concepts, but less focused on people. Important for effectiveness in scientific careers. Formal learning preferences: readings, lectures, exploring analytical models, and having time to think concepts through.</td>
</tr>
<tr>
<td></td>
<td>Reflective Observation</td>
<td></td>
</tr>
<tr>
<td><strong>Converging style</strong></td>
<td>Abstract Conceptualization</td>
<td>Find practical uses for ideas and theories. Solve problems and make decisions based on finding solutions. Prefer to deal with technical tasks and problems rather than social issues and interpersonal issues. Skills are important for effectiveness in specialist and technology careers. People prefer to experiment with new ideas, simulations, laboratory assignments, and practical applications.</td>
</tr>
<tr>
<td></td>
<td>Active Experimentation</td>
<td></td>
</tr>
<tr>
<td><strong>Accommodating Style</strong></td>
<td>Concrete Experience</td>
<td>Ability to learn from hands on experiences. Enjoy new and challenging experiences. Rely on others for information rather than</td>
</tr>
<tr>
<td></td>
<td>Active Experimentation</td>
<td></td>
</tr>
</tbody>
</table>
technical analysis. Effective for action oriented careers; prefer to work with others.
### Appendix I: Table 3

#### Table 3

**Active Learning Strategies**

<table>
<thead>
<tr>
<th>Type of Activity</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom assessment techniques (CATs)</td>
<td>Think-pair-share&lt;br&gt;Tell your partner&lt;br&gt;Directed paraphrasing</td>
</tr>
<tr>
<td>Group based learning</td>
<td>Out of class projects&lt;br&gt;In class group presentations&lt;br&gt;Study groups</td>
</tr>
<tr>
<td>In class discussion</td>
<td>Small group discussion&lt;br&gt;Large group discussion&lt;br&gt;Questions, Quotations and Talking Points&lt;br&gt;Just in Time Teaching (Saville, Zinn, and Jakobsen (2012))</td>
</tr>
<tr>
<td>Collaborative learning methods</td>
<td>Team based learning&lt;br&gt;Peer learning&lt;br&gt;Interteaching</td>
</tr>
</tbody>
</table>
Appendix J: Table 4

### Table 4

Comparison of Ethnography Study versus Case Study Research and the Applications to this Study

<table>
<thead>
<tr>
<th>Characteristics of Ethnography</th>
<th>Application to this study</th>
<th>Characteristics of Case Study</th>
<th>Application to this research</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Develop a complex, complete discussion of the culture of a group (Creswell, 2013)</strong></td>
<td>This group involves a range of disciplines, and teaching experience (both in and out of EPIC classrooms). The group is not a cohesive unit that works together at this point.</td>
<td>Begins with the identification of a specific case or project.</td>
<td>The specific project is identified as instructors wishing to teach in the EPIC spaces.</td>
</tr>
<tr>
<td><strong>Researcher looks for patterns of beliefs, ideas and behaviors of the group</strong></td>
<td>Patterns of beliefs, ideas and behaviors are difficult to discern in a group that consists of first time and experienced EPIC instructors.</td>
<td>The intent of the case is identified.</td>
<td>In this research, the case study is an “intrinsic case” (Stake, 1995)—a case that has interest that needs to be described and detailed.</td>
</tr>
<tr>
<td><strong>The group has been intact for long enough to develop working patterns with one another.</strong></td>
<td>This group has not been together in any discernable way. The EPIC instructors meet formally once per semester to discuss their impressions, opportunities and challenges in teaching in the EPIC spaces. Although this group of instructors is a select group, they do not seem to spend time together that is focused on teaching in EPIC classrooms. Given that the instructors come from</td>
<td>Presents an in-depth understanding of the case.</td>
<td>This case study is presented with data collected from multiple sources including interviews and direct observations of the research subjects’ behaviors.</td>
</tr>
</tbody>
</table>
such a wide range of disciplines, it is unlikely that they would spend significant time together forming a group culture.

**Researchers begin with a theory in mind and uses that theory to inform the data analysis and conclusions of the research.**

The underlying theory of this research has evolved from constructivist to Bandura’s social learning theory to Kolb’s experiential learning theory. This evolution is a direct result of literature reviews, interviews, observations, and feedback from my instructors.

The selection of how to analyze the data differs depending on the study.

This data has been categorized according to the classrooms being utilized.

Data analysis involves a thorough description of the subjects, identifies themes or specific situations.

Case study ends with conclusions formed by the researcher about the case.
## Table 5

### Phases and Timeline of the Study

<table>
<thead>
<tr>
<th>Phases of the Study</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase I:</strong> Interview Assistant Director of Operations</td>
<td>November 2015</td>
</tr>
<tr>
<td><strong>Phase II:</strong> Survey potential study participants</td>
<td>November 2015</td>
</tr>
<tr>
<td><strong>Phase III:</strong> Interview study participants</td>
<td>December 2015-January 2016</td>
</tr>
<tr>
<td><strong>Phase IV:</strong> In class observations</td>
<td>Observations completed by mid-February 2016</td>
</tr>
<tr>
<td><strong>Phase V:</strong> Follow Up Interviews</td>
<td>late February 2016</td>
</tr>
<tr>
<td><strong>Phase VI:</strong> Data Analysis</td>
<td>February/March 2016</td>
</tr>
</tbody>
</table>
## Organization of Data

<table>
<thead>
<tr>
<th>Participant</th>
<th>I₁</th>
<th>O₁</th>
<th>O₂</th>
<th>I₂</th>
<th>Missing Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Completed with transcript</td>
<td>Completed</td>
<td>Not completed</td>
<td>Completed with transcription</td>
<td>Observation 2 not completed due to weather.</td>
</tr>
<tr>
<td>002</td>
<td>Completed with personal notes only</td>
<td>Completed</td>
<td>Completed</td>
<td>Completed with transcription</td>
<td>Audio recording device did not record during interview</td>
</tr>
<tr>
<td>003</td>
<td>Completed with transcript</td>
<td>Completed</td>
<td>Completed</td>
<td>Completed with transcription</td>
<td></td>
</tr>
<tr>
<td>004</td>
<td>Completed with transcript</td>
<td>Completed</td>
<td>Completed</td>
<td>Completed with transcription</td>
<td></td>
</tr>
<tr>
<td>005</td>
<td>Completed with transcript</td>
<td>Completed</td>
<td>Not completed</td>
<td>Completed with transcription</td>
<td>Observation two not completed due to weather.</td>
</tr>
<tr>
<td>006</td>
<td>Completed with transcript</td>
<td>Completed</td>
<td>Completed</td>
<td>Completed with transcription</td>
<td></td>
</tr>
<tr>
<td>007</td>
<td>Completed with personal notes only</td>
<td>Completed</td>
<td>Completed</td>
<td>Completed with transcription</td>
<td>Audio recording device did not record during interview.</td>
</tr>
</tbody>
</table>
Table 7

**Validation Strategies**

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triangulation</td>
<td>Use of multiple data collection tools</td>
</tr>
<tr>
<td>Clarifying researcher bias</td>
<td></td>
</tr>
<tr>
<td>Member checking</td>
<td></td>
</tr>
<tr>
<td>Rich, thick description</td>
<td></td>
</tr>
</tbody>
</table>
Appendix M: Tables 8-9

Table 8

*Instructors with No Prior Experience Teaching in the EPIC Classrooms*

<table>
<thead>
<tr>
<th>Unique Identifier</th>
<th>College-level affiliation</th>
<th>Number of Years of Teaching Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>College of Arts and Letters</td>
<td>1</td>
</tr>
<tr>
<td>002</td>
<td>College of Business</td>
<td>14</td>
</tr>
<tr>
<td>003</td>
<td>College of Arts and Letters</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 9

*Instructors with Prior Experience Teaching in the EPIC Classrooms*

<table>
<thead>
<tr>
<th>Unique Identifier</th>
<th>College-level affiliation</th>
<th>Number of Years of Teaching Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>004</td>
<td>College of Heath and Behavioral Sciences</td>
<td>3</td>
</tr>
<tr>
<td>005</td>
<td>University Programs</td>
<td>5.5</td>
</tr>
<tr>
<td>006</td>
<td>College of Health and Behavioral Sciences</td>
<td>7</td>
</tr>
<tr>
<td>007</td>
<td>College of Health and Behavioral Sciences</td>
<td>12</td>
</tr>
</tbody>
</table>
### Appendix N: Tables 10-12

#### Table 10

**Amenities Available in EPIC Classrooms**

<table>
<thead>
<tr>
<th>Amenity Available</th>
<th>Amenity Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dry erase walls</strong></td>
<td>All four walls in each of the classrooms are painted with dry erase paint making it possible to write on all of the walls.</td>
</tr>
<tr>
<td><strong>Movable chairs and tables</strong></td>
<td>All chairs and tables in most of the classrooms can be easily moved (allows for flexibility of set up for the classrooms)</td>
</tr>
<tr>
<td><strong>Recording capabilities</strong></td>
<td>Classroom is equipped with video and audio recording capabilities.</td>
</tr>
<tr>
<td><strong>Multiple projection points</strong></td>
<td>Classrooms have multiple projection points throughout the classroom; allows for different material to be projected in different areas of the classroom; or for the same material to be projected in multiple places in the classroom</td>
</tr>
<tr>
<td><strong>Mac or PC set up available</strong></td>
<td>The technology in each classroom can be controlled by either Mac or PC platforms</td>
</tr>
<tr>
<td><strong>Apple TV available</strong></td>
<td></td>
</tr>
</tbody>
</table>

#### Table 11

**Data Used to Answer Research Questions.**

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Interview Data</th>
<th>Observation Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>What physical amenities are most often used in the EPIC classrooms?</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>What instructional strategies are used in the EPIC classrooms?</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Why do instructors choose to teach in EPIC spaces?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How has teaching in the EPIC classrooms impacted the instructors’ professional development?</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
### Strategies Employed in EPIC Classrooms

<table>
<thead>
<tr>
<th>Participant number</th>
<th>Anticipated strategies</th>
<th>Lecture</th>
<th>Small group discussion</th>
<th>Large group discussion</th>
<th>Team based learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Group work and share out to entire class; better monitor what students are doing in class “surveillance technique” (Personal interview, participant 001)</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>002</td>
<td>More focused time with individual groups; more physical movement by instructor and students</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>003</td>
<td>Very little lecture, team work, easier use of computers and technology for students</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>004</td>
<td>“engaged learning strategies”; activities, recording of facilitations and critiques, simulations</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>“small group discussion and activities”; simulated activities to work on; write on walls during discussions and activities</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---------------------------------------------------------------------------------------------------------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>006</td>
<td>Hybrid class—prep work done online and then activities in class; work in permanent teams for discussion and quizzes; engage as an instructor with teams on a more frequent basis</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>007</td>
<td>Team based learning, small and large group discussion; interactive lecture</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
Appendix O: Figures 1-3

Figure 1. Conceptual framework showing how innovation in active learning classrooms is dependent on classroom design and technology, instructional strategies, experiential learning theory and constructivism.

<table>
<thead>
<tr>
<th>Psychological</th>
<th>Social</th>
<th>Institutional</th>
<th>Cultural</th>
<th>Physical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning style</td>
<td>Peers</td>
<td>Policy</td>
<td>Values</td>
<td>Classrooms</td>
</tr>
<tr>
<td>Learning skills</td>
<td>Teachers</td>
<td>Organization goals</td>
<td>Norms and history</td>
<td>Architecture</td>
</tr>
<tr>
<td>Values</td>
<td>Community members</td>
<td>Traditions</td>
<td>Language</td>
<td>Environment</td>
</tr>
</tbody>
</table>

Figure 2. Kolb’s identified learning spaces (Kolb, 2014).
Figure 3. Iterative process of working in an innovative space, experiential learning theory, constructivism, and professional development.
Appendix P: Figure 4

*Figure 4.* Example of photograph to show configuration of classroom without students or professor present in the photo. Retrieved from:
http://upload.wikimedia.org/wikipedia/commons/0/0e/Dickinson_College_18_College_classroom.jpg
Appendix Q: Figures 5-6

Figure 5. Fink’s taxonomy of significant learning. (Fink, 2007)

Figure 6. Fink’s model of integrated course design (2007). This model shows that situational factors are the underpinnings to creating learning goals, teaching and learning activities and feedback and assessment.
Appendix S: Figure 8

Figure 8. Framework of faculty development support available to instructors teaching in active learning classrooms at McGill University. (A. Finkelstein, webinar, March 9, 2016.)
Appendix T: Figure 9

Figure 9. Research design for An EPIC teaching experience.
Appendix U: Figures 10-13

Figure 10. Layout of room 4041 with additional notes marking the movable instructor station, pods one through four, the location of the 5th pod, and the potential blind spot in the room.

Figure 11. Photograph of EPIC classroom 4044 with additional marking of instructor station between two projector slides.
Figure 12. Classroom 4043 with additional markings for instructor station, and screens one, two and three.

Figure 13. Drawing of classroom 4046 with no additional markings.
Appendix V: Figures 14-20

Figure 14. First two reviews of data for emergent themes.

Figure 15. Taxonomy of emergent theme of “classroom.”
**Figure 16.** Taxonomy of emergent theme “technology.”

**Figure 17.** Taxonomy of emergent themes of instructional strategies.
Figure 18. Taxonomy of reasons to teach in EPIC.

Figure 19. Taxonomy of professional development emergent themes.
Figure 20. Identified themes that fit no additional taxonomies.
References


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