TEACHING OUTSIDE THE BOX: STUDENT AND TEACHER PERCEPTIONS OF FLEXIBLE LEARNING

ENVIRONMENTS OUTSIDE THE 21ST CENTURY CLASSROOM

Chelsea B. Allison

Dissertation Prepared for the Degree of

DOCTOR OF PHILOSOPHY

UNIVERSITY OF NORTH TEXAS

May 2018

APPROVED:

Miriam D. Ezzani, Major Professor
James D. Laney, Committee Member
Kelly Feille, Committee Member
R. Jefferson George, Committee Member
James D. Laney, Chair of the Department of
      Teacher Education and Administration
Randy Bomer, Dean of the College of Education
Victor Prybutok, Dean of the Toulouse Graduate
      School

Allison, Chelsea B. *Teaching Outside the Box: Student and Teacher Perceptions of Flexible Learning Environments Outside the 21st Century Classroom*. Doctor of Philosophy (Educational Leadership), May 2018, 175 pp., 24 tables, references, 100 titles.

The purpose of this study was to ascertain student and teacher perceptions of the environment in which student learning takes place and their perceptions of how it has helped them in the cognitive and social domains. Data collected were through student and teacher perception surveys, student and teacher perception questionnaires, classroom observations, student focus group discussions, and teacher interviews. Themes that emerged from the data sources were student interactions, students' autonomy in personalizing their learning space, teacher perceptions of comfort in the classroom, and student perceptions of comfort in the classroom. The findings of this study point to four recommendations for educational leaders to ensure the effective implementation of new and dynamic learning spaces: (1) consult and support teacher and students, (2) provide professional development, (3) visit campuses and other learning spaces, and (4) add color. In order for real change to take place, teachers need to enquire about and embrace student preferences and allow for the discomfort that will be present when trying something new. Teachers must be willing to relinquish control of the learning experience for the student in order to allow for possibilities in personalized learning on the part of the student. They must risk initial failure in order to allow for greater successes in the long run.

ACKNOWLEDGMENTS

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1

INTRODUCTION

A Personal Narrative

In 2006, I participated in a graduate course on educational facilities that opened my

eyes to the role of the educational environment in student learning. After that semester, every

new space I encountered elicited the same question: Are there components of this space that

can be incorporated into the school that would provide a more diverse and engaging learning

experience for students?

In 2012, a friend invited a colleague and me to tour the Facebook Austin campus where

he worked. This was a pivotal moment for me. As I was already predisposed to view new spaces

through the lens of possibilities, this was the moment I saw possibilities realized. Gone were the

compartmentalized cubicles often present in large office spaces. In their place were

customizable and adjustable desks that could be modified to fit the individual's work

preference and height. Employees weren't limited to working at their desks, though. Facebook

provided a variety of other spaces for individual, small group and large group work. Around

every corner was something new: small and large break-out rooms, decorated to reflect

popular characteristics of Austin; a wall of windows bordered by swinging chairs; random Lego

niches alongside long bar-height tables and stools; and stationary bike desks. We encountered

vending machines that held a selection of printer cables, USB memory sticks, dongles, etc. With

the swipe of an employee card, whatever was needed was dispensed at no cost to the

employee, when it was needed. The entire campus sent one very clear message: employees

work best in personalized spaces. If employees work best in an environment that provides

variety and personalized spaces, why are we teaching students in large, impersonal learning environments?

In August 2013, I was named principal of Cecil J. Rowe Elementary School in an urban Texas school district. As the newly appointed principal, my first order of business was to conduct a facility assessment. This solitary walk of the building allowed me to get a feel for the space and an informal glimpse into the teaching styles of my teachers. After getting lost in the seemingly endless maze of white corridors, I foresaw a very basic problem. If I got lost as an adult, how were we to expect five-year-olds to navigate the halls and find their way around?

My first year was spent learning about the culture of the campus and immersing myself into the school community. By the end of my first school year, I had a vast collection of ideas to create more engaging learning spaces within the school, and a cohort of supportive teachers and staff to help me execute my plans. My secretary and I spent the first couple of weeks of that summer at Cecil J. Rowe Elementary picking out colors and preparing the building for a new look. When students returned for the fall semester of 2014, they were greeted by brightly painted halls and eye-catching illustrations on the walls and floors. The halls were laid out in a modified figure-eight comprised of seven intersecting corridors. We painted each corridor a different color: red, blue, green, orange, yellow, violet, and light blue. The entrance foyer and main hallways were painted with brightly juxtaposed colors to create a cheerful greeting to students and visitors. A large wall calendar, comprised of clear plastic sleeves, was hung on one wall, communicating upcoming events and activities. A simple clock was turned into a focal piece by making the clock face into an 'o' and adding a 'c', 'l', 'c' and 'k' to spell out the word 'clock'. On the floors throughout the building were upper case and lowercase alphabet letters,

numbers from 1 to 150, and skip counting number sequences counting by 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, and 12s. There were shapes, fractions, mnemonic devices, and college pennants on the floor. Every part of the building sent the same message: learning can happen everywhere.

Over the course of the 2014-2015 school year, a number of other projects were executed as well. By adding four large area rugs, eight rocking chairs, two rolling bookcases, a handful of books and floor cushions, an underused corridor was converted into a reading lounge. A section of the library that was occupied by a large wooden box and out-of-date reference materials was converted into a makerspace, comprised of Legos, a button maker, foam building blocks, puzzles, and a 3D printer. With the addition of repurposed outdoor furniture, a galvanized water trough, a few hundred square feet of sod, musical instruments, and a water/sand table, the overgrown, muddy courtyard was turned into an outdoor learning space. The entire school was transformed from an institution of learning to a student-centered learning environment.

Spring 2017, a flexible learning lab was created in a vacant classroom. Designed to provide a variety of seating and standing options, the learning space allowed for flexibility of instruction, and was accessible by all teachers. The room was divided, and spaces were designated, to allow for learning to take place in campfires (learning from an expert), watering holes (learning from peers), and caves (learning from introspection) – three of David Thornburg's four learning settings which he designated primordial learning metaphors (Nair, 2014). Deep-seated, molded chairs and adjustable stools were provided to establish the campfire and watering hole design elements, along with portable floor cushions, rocking stools,

and bar height tables. A large playpod with shelving was installed, providing a cave space for students who needed to isolate themselves from their peers. A section of the space was also designated for students to build and explore through hands-on learning.

Background of the Problem

In his 2010 animated TED Talk, Changing Education Paradigms, Sir Ken Robinson warned educators and policy-makers that schools resemble factories. In an interview, Robinson stated, "The current system [of education] doesn't just represent the interests of the industrial model, it embodies it" (as cited in Cannon Design, VS Furniture., & Bruce Mau Design, 2010, p. 56). For the most part, he is right. Schools have become stagnant in their approach to teaching and learning. Current learning environments are not designed to optimize learning for 21st century students. While a great deal of emphasis toward change has been placed on teaching practices and student learning modalities, to the detriment of students, many education systems in America still operate as they have since the early 1800s. The school calendar is set by seasons, hours are marked by Carnegie units, students are grouped by age, and move from class to class where they sit in rows of desks and receive knowledge like bottles on a conveyor belt. Unfortunately, this leaves students ill prepared for the limited jobs that will be available to them in highly technological and collaborative positions that require a skill-set not yet realized. Twenty-first century elementary students need to be taught skills that will prepare them for jobs that do not yet exist. Daggett and Jones (2014) observed,

> The skills individuals need for success in the 21st century are vastly different from those needed in the past. Our education system must evolve in order to prepare students for the changing world in which they will live and work. American society is undergoing fundamental structural changes at the family, workplace, and community levels. (p. 2)

In order for schools to meet the changing needs of students, they must examine current practices and determine if they are the most efficient and effective ways to teach 21st century students. Likewise, they must look to the environments that have been created to dispense learning and determine whether students are being provided with the most effective and equitable spaces for learning.

There are schools where traditional learning spaces are being dissolved to make room for innovation and purposeful exploration. Wood (1992) observed,

> There are schools and classrooms in the United States today that you know are special the moment you step into them. . . . There is a delightful sense of purposeful clutter to these classrooms and schools. They are places to do things in, not places to sit and watch. Real work goes on here, and real products go home. (pp. xiii-xiv)

Ehmann, Borges, and Klanten (2012) described a number of schools throughout the world that "inspire innovation and imagination over mere execution and passive learning" (p. 5). The bright yellow and green structure of Germany's Taka-Tuka-Land provides young learners with a space that is designed for climbing, hiding, and playing both inside and out; bold colors and graphic designs flow through the common areas of the Starlit Learning Centre in Hong Kong, China; and flexible, naturally-lighted classrooms of the United Kingdom's Sandal Magna Primary School encourage a variety of activities for learning, exploring and playing.

Statement of the Problem

Twenty-first century students do not learn in the same ways students learned in the past. A 2014 study conducted by the National Center for Education Statistics (NCES) showed of the 62,600 elementary schools included in the report, 44% of those schools were 15-years old or older, and 19% of the schools were 35-years old or older (Snyder, de Brey, & Dillow, 2016).

5

Students attending 11,894 American schools today are learning in schools that were built before many of their parents were born. According to Nair (2014), "the average age of schools in most districts across the nation is between thirty and fifty years" (p. 1). To put this in perspective, when these schools were built there were no personal computers, compact discs, or cellular phones. The internet, and therefore online gaming and research, was not even a concept for educational planners. Although necessity has required updates to the infrastructure of these schools, many schools still operate in the same manner in which they have operated since opening their doors. As a result, many schools are ill-prepared to meet the evolving needs of students. Nair (2014) observed, "Traditional school buildings fall short when evaluated against the goals for student-centered learning" (p. 1).

Purpose of the Study

The purpose of this study was to ascertain student and teacher perceptions of the environment in which student learning takes place and their perceptions of how it has helped them in the cognitive and social domains. I investigated diverse learning environments, as well as student and teacher perceptions of the social impact learning environments have on student learning. I also examined student and teacher perceptions of the academic impact learning environments have on students. Consideration was given to contributing factors that related to how students learn, how teachers facilitated learning in different settings, and the role and influence of peer interaction on learning acquisition.

Research Question

In order to determine the relationship between student and teacher perceptions of

learning and the environment in which student learning takes place, I presented and answered

the following research questions:

1. What are student perceptions of the environment in which they learn in relation to cognitive and social development?

2. What are teacher perceptions of the environment in which they teach in relation to students' cognitive and social development?

3. What is the relationship between student and teacher perceptions of the environment in which learning takes place and its perceived influence on student academic development?

Conceptual Framework

The conceptual framework for this study was constructed through the tripartite lens of

constructivist learning theory, social cognitive theory, and public space theory, with specific

emphasis placed on public space theory as shown in Figure 1. Woven together, these three

theories created a tapestry of thought through which to explore the sociological, academic, and

environmental context in which students learn, and the influence these factors have on student

and teacher perceptions about the ways students take in and process new information.

Public space theory speaks predominately to the social interactions that evolve within

public realms, such as commons and walkways. In his book, *Life Between Buildings*, Gehl (2011)

observed, "Opportunities for meetings and daily activities in the public space . . . enable one to

be among, to see, and to hear others, to experience other people functioning in various

activities" (p. 15). Gehl's research predominantly outlines two recurring characteristics

pertaining to public spaces: the functionality of public spaces and the social interactions allowed or disallowed within public spaces. When applying public space theory to educational facilities, educators acknowledge the importance of functionality and social interaction in learning environments. Fortunately, both concepts have deep roots in educational learning theory.
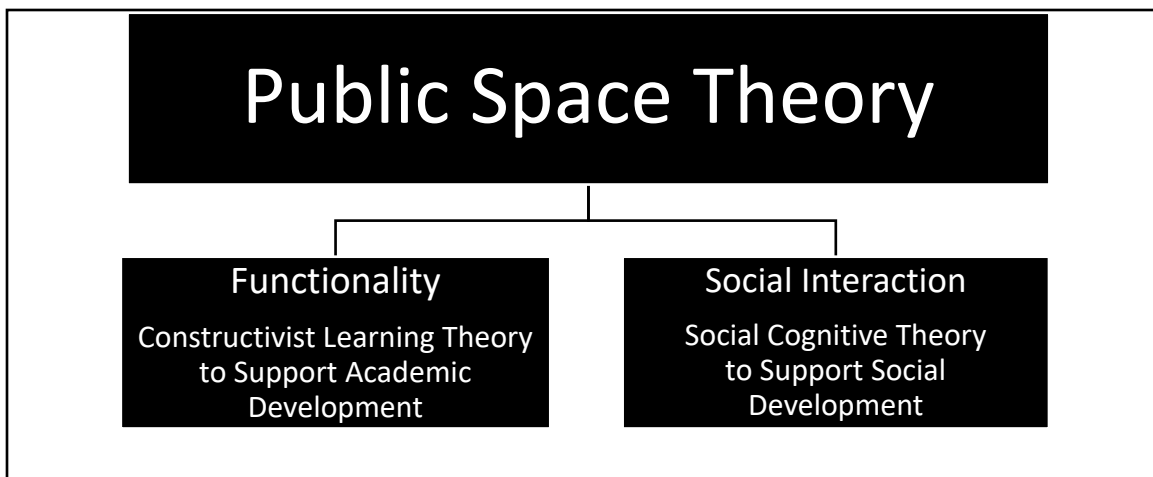
Figure 1. Conceptual framework. This conceptual framework is based on the public space theory as presented by Gehl (2011).

For the purpose of this study, constructivist learning theory was applied to the understanding of functionality in learning spaces. Constructivist learning theory is the belief students learn best when they are allowed to create their own learning experiences, and are given an opportunity to apply their past knowledge to new learning experiences (Juvova, Chudy, Neumeister, Plischke, & Kvintova, 2015; Kritzenberger, Winkler, & Herczeg, 2002; Liu & Chin, 2010; Scheer, Noweski, & Meinel, 2012; Yildirim, 2014; Yilmaz, 2008). Constructivist learning environments provide opportunities for students to exercise autonomy in learning, while constructing new knowledge and capitalizing on social interactions to expand learning experiences. As such, constructivism in education speaks to the external factors that motivate

8

learning and support functionality of the space, such as learning context and physical environment.

Educators must also have a firm grasp on how students interact with one another in a multitude of settings, and how this interaction impacts knowledge acquisition. Social learning theory, also referred to as social cognitive theory, was considered in the applicability and understanding of social interactions between students and their teacher. Similar to constructivist ideals, social learning theory is based in the belief that learning is constructed. Unlike constructivist learning theory, social learning theory speaks to the internal factors that motivate learning: brain and human development, learning styles and self-efficacy, all of which ultimately influence how students interact with one another in social and learning settings (Ertmer & Newby, 2013).

Significance of the Study

The impetus of this study was to effect change in 21st century school design and learning environments. Current learning environments reflect the needs of past generations of learners. Twenty-first century learning must take place in learning environments that are designed for, and reflect the needs of 21st century students, while preparing students for the college and career opportunities of tomorrow. This study gives a voice to teachers and students about what learning environment elements work best for them; and endeavors to provide stakeholders with guidance on future-forward facility design options.

Assumptions

In this qualitative study, I relied on the perceptions and experiences of students and teachers of the innovative campus chosen for this study. An assumption was information shared by the students and teachers through the surveys and questionnaires, as well as the in-depth face-to-face interviews and focus groups, would present an accurate picture of the perceptions and beliefs of the study participants. I assumed the documents collected and analyzed throughout the study were accurate as well.

Delimitations

In this study, I examined the impact of learning spaces as they influence the perceptions of students and teachers. Parameters were established within the study to provide appropriate delimitations. The primary delimitation of the study was the selection of participants: intermediate students and teachers. Older students have more instructional and contextual experience; and are more familiar with the changes that have taken place in the research site. The teachers selected were those who currently deliver direct instruction to the chosen student group.

A second delimitation in the study was the selection of the research site. The chosen site has undergone a number of spatial reconfigurations to provide students and teachers with access to flexible learning spaces outside of the classroom. Many of the changes have been in place for more than one school year, allowing teachers and students extended access and exposure to the spaces.

Definition of Terms

The following terms are defined as they specifically apply to this study to facilitate a clear understanding of the importance of these terms for the reader.

Classrooms–enclosed spaces used for delivery of instruction (National Center for Education Statistics, 2006).

Cognition–knowledge acquisition; understanding through thought, experience, and the senses (Cognition, 2002).

Commons–common areas within and without the school building where groups can gather (Gordon, 2010). Examples may be courtyards, cafeterias, auditoriums, multi-purpose rooms, and libraries.

Corridors–spaces used for traversing from one area of the school to another (Le, 2010).

Labs–specially designated and designed areas used for a prescribed purpose. Examples may be science labs, computer labs, STEM labs, and maker spaces ("Room type," n.d.).

Learning environment/learning space–for the purpose of this study, the terms learning environment and learning space will be used interchangeably to refer to those formal and informal spaces in which learning takes place (Kuuskorpi & González, 2011).

Learning modalities–a variety of methods through which students take in and learn new information (Powell, 2013).

Perceptions–ways in which students and teachers regard, understand, and interpret external factors that influence social and academic development as it relates to the learning environment (Perception, n.d.).

Organization of the Study

The organization of this paper includes five chapters. Chapter 1 is the introduction to the paper, and provided a brief overview of the research topic, along with a glimpse into the impetus of the research study. Chapter 2 is the review of related literature relevant to this study. The review of literature first establishes the historical significance of learning environments in America and how they have changed throughout time. Emphasis is placed on those periods in which significant architectural or philosophical changes impacted the design and layout of various learning environments. I then explore the traditional definition of learning spaces, common characteristics of current learning environments, and the types of learning spaces today's students might encounter. Finally, the review of literature includes common teacher and student perceptions of learning environments; and the impact learning environments have on students' social and cognitive development. Chapter 3 is a detailed explanation of the research methodology used and the ontological and epistemological paradigms from which I viewed the study. Also, included in the third chapter is a description of the unit of analysis and participants in the study. Respectively, Chapter 4 and 5 are overviews of the research findings, and the analysis and conclusions based on the resultant findings.

Summary

The purpose of this study was to ascertain student and teacher perceptions of the environment in which student learning takes place and their perceptions of how it has helped them in the cognitive and social domains. The study was designed to understand better the relationship between student and teacher perceptions, as well as the overall influence these

perceptions have on the social and academic domains. This chapter provides a general

overview of the purpose, significance, and structure of the study. The conceptual framework

depicts the relationship among the concepts inherit within the study.

CHAPTER 2

LITERATURE REVIEW

Reimagining learning spaces requires a paradigm shift in how educators view school facility design. Change is slow, and in terms of facility design can be cost prohibitive. School districts are invested in the facilities that exist and essentially perpetuate the ineffectiveness of some facilities by maintaining the physical plant, even when doing so is adverse to their desired educational outcomes for students (Nair, 2014, p. 2). There are places, however, where innovation is being employed in the design of learning environments. A new reform in the Danish educational system resulted in educational facilities that are designed to "encourage communication and interaction while striving to achieve a more life-like studying environment" (Ehmann et al., 2012, p. 46).

Similar pockets of change throughout the world have illustrated how minor, and bold, changes can have significant influences in student learning and social development. In this chapter, I discuss different learning spaces in terms of their relative impact on student learning and development. I also explore current trends inside and outside of educational facility design, along with research that highlights change potential in various contexts. Robinson (2015) observed, "The physical environment of the school affects not only how the school feels but also how it actually works" (p. 192). In order to understand the current state of educational facilities best, it is necessary to look at where educational facilities began and how they have evolved over the years.

Historical Overview of Learning Space

The history of educational facilities in America dates back to the early 17th century, with the founding of the first public school, Boston Latin School, in 1635. In the 18th century educational facilities predominantly reflected the monitorial system of teaching, one room school houses, under the tutelage of one teacher, where students of all ages were taught (Editors of Encyclopedia Britannica, 2017). In 1837, Horace Mann, who was appointed secretary of education for Massachusetts, initiated the Common School movement. The premise behind this movement was the belief that "children could expect a high-quality education from any school, district-wide" (Education News, 2013, para. 5). Mann's work resulted in the institution of common school curricula, age grading of students, and normalized teacher training (Baker, 2012; Education News, 2013). It also yielded the establishment of the "standard adequate classroom" in which desks were arranged in a series of rows and the teacher presented from the front of the room (Baker, 2012, p. 4).

Post-Civil War child labor movements led to large numbers of disenfranchised children. Consequently, more children needed to attend school. According to Baker (2012), "schools built during the last decades of the 19th century and early decades of the 20th century were largely standardized, utilitarian spaces that were designed to house as many students as possible, maximizing classroom space" (p. 4). Although predominantly reflective of Mann's classroom design, there was the emergence of some consideration for student-centered learning in the facility designs of the 1930s. With considerable support by the Public Works Administration, a prolific number of schools were built during this time period, and of those schools, some reflected a new school of thought in school design. "Open Air" schools provided opportunities

for students to access outdoor learning, provided fresh air and placed an emphasis on natural

light (Baker, 2012, p. 8).

The baby boom following World War II provided an equally notable boom in school

enrollment, resulting in a need to build more schools. The most notable architectural

contribution to educational facilities during this time was the "finger-plan school" (Baker, 2012,

p. 11). Much like many schools today, these facilities were designed as a series of central

corridors off which classrooms extended like fingers. This design concept allowed for "better air

circulation, lighting, and access to outdoor space" (p. 11). These newer building were a

departure from the classical style architecture seen in earlier periods and featured flat roofs,

ribbon windows, and lightweight construction materials. There was also a noted shift from two-

story to one-story buildings, and the "initial installation of air-conditioning" (p. 11) and

"fluorescent lighting" (p. 14).

Between 1960 and 1980, school design became more "impulsive" (Baker, 2012, p. 17).

During this period, enrollment was on a decline, desegregation was instituted, and the

effectiveness of urban schools was becoming highly scrutinized. More emphasis was placed on

"the role of the arts and creativity in learning" (Baker, 2012, p. 17). According to Baker,

"Researchers were starting to recognize the connection between school facilities and student

learning" (p. 17). As a result, in ushered the movement toward flexible learning environments

with open concept classrooms. In these schools, learning spaces were shared spaces

characterized by their lack of walls, doors, and often windows (Baker, 2012; Cuban, 2004, 2009;

Nair, 2014). Baker (2012) described these spaces as "large 'pod' areas [that] served as the

major classroom spaces, with little definition of space within them" (p. 17). The premise behind

the open classroom model was to allow for multi-level instruction in a large space with several

teachers (Baker, 2012; Cuban, 2004, 2009; Nair, 2014). According to Nair (2014), the failure of

these schools was due in part to the design itself. He wrote, "Without quiet zones, restorative

areas, enclosed spaces for smaller groupings and focused work, handpicked furniture, and

acoustic treatments that would be essential for the different activity zones to work as desired,

the open-classroom design is almost certain to fail" (p. 10). Although there was significant

research behind the creation of open-concept schools, there is not sufficient research on

whether or not the open space schools were beneficial to student learning. Nair (2014),

however, suggested open-classroom schools "remain disproportionately influential today in

decisions about school design" (p. 10). He contended their demise has led to a "myth that any

change from a traditional classroom-based model of education represents a return to the failed

open-classroom movement" and that this myth impedes the design of more conducive learning

environments (Nair, 2014, p. 10).

If indeed the average age of schools in America is between 30-50 years, this would be

where our historical overview of school facilities ends (Nair, 2014). And, in fact, for many

schools across the nation, it is, but not for all. Much of the 1980s and 1990s were centered on

compliance. A 1995 report by the General Accounting Office found U.S. schools needed

approximately $112 billion repair, just to be up to *good overall condition* (Baker, 2012).

Temporary fixes to unstable enrollment projections in the form of portable classrooms became

more permanent than temporary (Baker, 2012). Other common trends in school design

developed, such as green building and prototyping.

Today's schools, according to Nair (2014), "need to be designed from the ground up to support four essential design principles . . . they need to be welcoming, be versatile, support various learning activities, and send positive messages about activities and behavior" (p. 11). Jensen (2003) stated, "Maximum attention ought to be given to creating an engaging, interesting, and safe environment" (p. ix). Coffeen (2014) advises there are five trends in K-12 education to consider when designing schools. These trends are small learning communities, distance learning, flexible learning environments, going green, and incorporating technology (Coffeen, 2014).

<center>Learning from Workspace Design</center>

For years the workplace has been evaluated for employee satisfaction, but it is not until recently a critical eye has turned to how schools can learn from workplace design. In a 2010 case study, the learning environment for California-based charter school, High Tech High, was described thusly, it "feels more like a high-performance workplace than a school" (Ball State University, 2010, p. 83). On their website, the Center for Advanced Professional Studies, a special program school in the Blue Valley Unified School District in Kansas, stated,

> CAPS strives to revitalize the culture of education by creating an innovative environment where business, education and community collaborate to become a global learning community, creating meaningful experiences for students, promoting their quest for self-discovery and developing them as innovative leaders of the future. (Center for Advanced Professional Studies, 2016, para. 1)

Glassdoor's 2016 Employee Choice Awards spotlights employers who rated the highest on employee engagement surveys between November 2013 and November 2014 (Dill, 2015). Nine out of the top 10 ranked employers: Airbnb, Bain & Company, Guidewire, HubSpot,

Facebook, LinkedIn, Google, Nestle Purina Care, and Zillow all share one very distinct quality—

they provide a work environment that allows for choice, flexibility, and collaboration

(Glassdoor.com, 2016). On the Airbnb (2016) website, learning is embedded in their work

ethos. Their website stated,

> We believe that engineering is a continuous process of learning and improvement, and that the best way to learn is by getting help from your fellow engineers. All of our engineers hang out in chat rooms so that we can keep informal knowledge sharing flowing - and because coding is more fun when you do it together. We host regular tech talks, both internal and external, so that everyone gets a chance to become the best at their craft. (Airbnb.com, n.d., para. 1)

The Bain & Company (2017) website, claimed "you'll be immersed in a vibrant, supportive

culture where you'll feel at home, regardless of the city you're in" (para. 3). Zillow simply

stated, "Our people are the top reason employees love working at Zillow Group. Together, we

tackle complex challenges and explore uncharted territory. We welcome all ideas and

backgrounds, and our award-winning benefits encourage work-life balance, not burnout"

(Zillow.com, 2016, para. 3). Each web site posts pictures of employees working alongside each

other on bean bags or in ergonomic chairs in a flexible workspace. There are pictures of mud

races, ping pong games, and dress-up days. What one does not see is individuals wearing suits

and ties in cubicle offices.

The reason for such a drastic departure from the typical work environment is likely

evidenced in the results of a 2010 study conducted by IBM Institute for Business Values (2010)

of more than 1,500 chief executive officers. The most important quality for leadership success,

the study revealed, is creativity (Carr, 2010). IBM claimed CEOs "place a higher premium on

agility and experimentation, because they know these are prerequisites for disruptive

innovation" (IBM Institute for Business Values, 2010, p. 11).

Characteristics of Learning Space

Italian educator, Maria Montessori, believed learning should happen through self-

discovery and exploration (Montessori, 2012). The learning environment should be designed to

allow students to access materials that reinforce their learning and provide opportunities for

learning extensions. Schoolroom furnishings are selected with the purpose of the child

becoming "capable of conducting himself correctly, and yet, with perfect freedom" (p. 48). The

sounds associated with movement were considered evidence of learning experiences.

Montessori (2012) wrote,

> In the old method, the proof of discipline attained lay in a fact entirely contrary to this;
> that is, in the immobility and silence of the child himself. Immobility and silence which
> hindered the child from learning to move with grace and discernment, and left him so
> untrained that, when he found himself in an environment where the benches and chairs
> were not nailed to the floor, he was not able to move without overturning the lighter
> pieces of furniture. (p. 48)

In Reggio Emilia schools, the learning environment is an extension of the parent and

teacher. The environment is in fact considered the third teacher, "a setting designed to be not

only functional but also beautiful and reflective of the child's learning" (Biermeier, 2015, p. 73).

Waldorf School of the Roaring Fork boasted, "Gone are the days of sterile surroundings, square

box classrooms and fluorescent lights" (Waldorfschoolrf.com, 2016, para. 2). The school

embraces the Steiner's Waldorf Philosophy of nurturing creativity, intellectual flexibility, and

moral courage, through a conducive learning environment. New (2007) describes the Reggio

Emilia learning environment as rich in color, texture, and design; and "sparkling clean, with a

palpable absence of clutter" (p. 8). She went on to observe, "Teachers in Reggio Emilia have

maximized the environment's potential as a developmental niche where children acquire the

skills and understandings that enable them to successfully participate in their cultural community" (New, 2007, p. 8).

Other innovative design practices in education include building sustainable facilities and technology-rich spaces. As societal focus shifts to environmental and technological advancements, it is increasingly more common for schools to embrace these design features in new facility construction projects and the renovation of existing spaces. According to Robinson (2015),

> In education, there's an abundance of emergent features right now that are changing the context in which schools work and the culture within them. . . . The spread of digital technologies is already transforming teaching and learning in many schools. . . . The growing availability and sophistication of digital technology is transforming both the world in which students learn and the means by which they do it. (pp. 64-65)

Cannon Design et al. (2010), in their book *The Third Teacher: 79 Ways You can use Deign to Transform Teaching & Learning*, stated, "Schools in the U.S. spend $7.8 billion on energy each year–more than the cost of computers and textbooks combined" (p. 137). This suggests embracing emergent school design trends in sustainability and technology is both fiscally and environmentally responsible. Design trends notwithstanding, there is an inherent need to rethink building design and spaces for learning.

Although not exhaustive, for the purpose of this study four types of learning spaces were considered for their overall influence on student learning. These four spaces are classrooms, commons, corridors, and labs. Each space has unique qualities that provide learning opportunities for students; and each is a commonly found space in schools. The following literature provides context for the spaces in the school which were examined in this study.

Classrooms

     Classrooms, according to Nair (2014), serve a specific instructional purpose: listening to a lecture or presenting on a topic. In many cases, however, classrooms are the physical embodiment of the Taylorism factory model, reducing the dissemination of knowledge into an assembly-line process of moving students from room to room, or center to center, where teachers add chunks of information piecemeal (Nair, 2014). Most classrooms are not conducive to versatility in learning, do not meet the needs of multiple learning modalities, and do not easily support professional collaboration. Brown and Long (2006) posited the classroom format is "not conducive to discussion among students; the design optimizes instructor transmission—students receive content, packaged and presented with a 'one size fits all' approach, regardless of the learners' unique needs or styles" (p. 9.3).

     Generally, teachers are more comfortable teaching in isolation, because that is how they learned, and how they learned to teach. Stack (2016) observed, "Teachers often learn to teach in isolated boxes and emulate that style throughout their career" (para. 10). Unfortunately, this model of teaching does a disservice to students today. As Stack (2016) stated, "Out of school people work in teams to solve problems. They are visually and often aurally connected. Collaboration is a vital skill. Isolated classrooms are already obsolete" (para. 10). According to Nair (2014), "Typical classroom design is based on the erroneous assumption that efficient delivery of content is the same as effective learning" (p. 64). "The classroom is a relic, left over from the Industrial Revolution, which required a large workforce with very basic skills" (Nair, 2011, para. 4). Nigaglioni (2010) suggested, "Most spaces used as classrooms lack the physical and environmental components to improve student performance: natural light,

adequate ventilation, good acoustics and flexible furniture" (p. 191). Danielson (2007)

observed, "When a classroom is a true community of learners, students themselves become

involved in the physical environment and take initiative in making it effective" (p. 75).

According to Brown and Long (2006), the shift toward "human-centered design is through

moving away from learning environments designed for information dissemination, or

"information commons," to spaces that are designed for student inquiry and discourse such as

"learning commons" (p. 9.4).

Learning Commons

Learning commons, or indoor public spaces designed for learning, are the opposite of

classrooms. They are not isolated, and typically are not conducive to lecture or presentations.

They are, however, conducive to conversation and socialization. In schools, these common

spaces are the foyer, cafeteria, libraries, gymnasiums, or any other area in the school in which

students might gather. Nemeth (2012) argued, "Dynamic public spaces can encourage

innovation, as patrons use space in creative and unintended ways" (p. 812). Nair (2014)

recommended offering a variety of informal and formal learning spaces that allow "learning

from peers, learning by application, and learning a range of highly sought-after 'soft' skills that

are increasingly demanded by the business community" (p. 29).

Keating and Gabb (2005) recommended the following qualities of learning commons:

they should be learning oriented, learner-centered, flexible, and collaborative; as well as

community-building (p. 17). They suggested, in order for learning commons to be beneficial,

however, teachers must "support, promote, and incorporate the development of independent

learning" and provide for opportunities for students to utilize learning commons (Keating &

Gabb, 2005, p. 13).

Loertscher and Koechlin (2014) described learning common as a space that "serves

school curriculum but also is known as a place for experimenting, playing, making, doing,

thinking, collaborating, and growing" (p. E3). They went on to highlight critical characteristics of

learning common to be a collaborative environment that "invites and ignites participatory

learning" (p. E4) and "a responsive dynamic that is invested in school-wide improvement

through an evidence-based process of design, modify, rethink, redesign, and rework" (p. E5).

Corridors

School corridors are an untapped resource in most schools. They make up roughly 20-

30% of unused space in schools and are highly conducive to negative behaviors in students (Le,

2010; Nair, 2014; Nigaglioni, 2010). On the School Design Matters blog, Stack (2012) wrote,

"Corridors take up a lot of valuable real estate in a school and are unoccupied most of the time"

(para. 5). Nair (2014) noted hallways are "single-purpose" and "remain unused for a majority of

the school day." (p. 64). He went on to state, "Their lack of versatility and scarce use combine

to make hallways very inefficient" (p. 64). Nigaglioni (2010) described corridors as "typically

poorly planned" and "institutional" (p. 193). Nigaglioni went on to posit,

> the opportunity to enhance learning by enhancing common/circulation spaces has been
> overlooked in the past, as the focus has been on other strategies to improve student
> success; [and] understanding that no two students are the same and using learning
> styles as a platform, we can take learning outside the classroom and into the corridors.
> (p. 193)

Le (2010) suggested, "Corridors can be spaces for informal learning, to display work, to meet, and to reflect" (para. 4).

Labs and Studios

Labs are highly-specialized spaces designed to meet certain learning criteria. They tend to be inflexible spaces, seldom used for anything other than their intended purpose. In most schools, labs are almost exclusively intended for science experiments. Nair (2014) contended, "Whereas labs dedicated mostly to science education historically represented a small portion of the traditional school day, tomorrow's schools will see an increase in lab-like studios that support all kinds of project-based learning" (p. 87). Labs will become more fluid in their use and purpose; and provide opportunities for students to learn independent of the instructor. They will provide a wider variety of real-life learning experiences, in a variety of applications and constructs (Nair, 2014, p. 87). "What we need," Nair wrote, "is a laboratory-type space for group collaboration and hands-on project work even when the space is not being used for lab-based experiments" (p. 92). He suggested five alternative spaces for schools: the Da Vinci Studio, the espresso studio, the maker lab, the Jamie Oliver studio, and the black-box theatre (Nair, 2012, p. 94). Each space is designed specifically to enhance the interdisciplinary learning experience of the student. The objective, according to Nair (2014), "is to provide schools with a richer palette of teaching and learning opportunities" (p. 102).

Student and Teacher Perceptions of Learning Spaces

Perception is defined as "the way in which something is regarded, understood, or

interpreted" (Perception, n.d.). A notable quality of perceptions is that they are greatly

influenced by sensory experiences, such as "the ability to see, hear, or become aware of

something through the senses" (Perception, n.d.). Neisser (1976) suggested "perception, along

with thinking, problem-solving, and sensing, is a cognitive construct" (p. 4). As such, in order to

determine if there is a relationship between the environments in which learning takes place

and student academic and social development, it is necessary to understand the role of student

and teacher perceptions as they relate to learning spaces. A number of studies have been

conducted with the intention of drawing out a connection between learning environments and

student perceptions, with a handful of studies including the perceptions of teachers.

For example, a 2014 study of primary-aged school students found "a school that has [a]

very serene and inviting environment promotes teaching and learning, hence pupils derive

more satisfaction being a pupil in the school" (Aina, 2014, p. 150). The study further noted,

"Pupils will derive more satisfaction with school when they have the opportunity to interact

freely with the teacher and the learning environment" (p. 150). A study by Wright and Cowen

(1982) examined the relationship between student perceptions of the learning environment on

a number of factors, including mood and academic achievement. Wright and Cowen found, for

problem students—students identified as acting-out, shy, anxious, or unpopular—there was a

strong link between perceived environment and student mood (p. 699). For these students,

Wright and Cowen observed, "high perceived Order and Organization, Affiliation, and

Innovation related to more positive and/or fewer negative moods" (p. 699). This same study,

however, "failed to find a relationship between perceived class environment and academic

achievement" (p. 699). In response, the authors speculated, "The elementary class environment

may be too diffuse to permit accurate prediction to specific reading and math performance" (p. 699).

On a very elemental level, a handful of studies have shown students perceive security and value in school environments that are clean and well maintained. According to Kilgore and Reynolds (2011), "People behave differently when buildings look neglected versus well kept" (p. 91). "Physical appearance is the first signal to students and teachers about the likelihood of whether they will feel respected and safe once they are inside [the school]" (Kilgore & Reynolds, 2011, p. 91). Jensen (2003) shared the results of a study that suggested learners suffer in poor learning environments. The researcher found "a positive relationship between building conditions, academic performance, delinquent behavior, and absenteeism" (Jensen, 2003, p. 42).

The most evident gap in most studies, however, is that they focus predominantly on secondary and post-secondary students. Little research is available on the perceptions of primary and intermediate students relating to their learning environment. As noted by Wright and Cowen (1982), the nature of elementary classroom structures could impede the accuracy of reported data. Another challenge, as presented in a study by the Bill and Melinda Gates Foundation (2012), is differentiating between teacher and a variety of classroom contexts. The study showed students perceive "clear differences among teachers" (Bill and Melinda Gates Foundation, 2012, p. 5).

Review of Theories Applied to the Study

The conceptual framework of this study relied on the integration of three theories:

public space theory, constructivist learning theory, and social learning theory. To substantiate how these theories apply to this study better, it is important to understand how they relate to one another, and how they relate to learning spaces.

The Connection between Learning Spaces and Public Space Theory

The question of whether external influencers, when juxtaposed to increase relative learning, have a significant role in the development of the human dates back as far as John Locke (Gianoutsos, 2006). For centuries, the debate over nature verses nurture vacillated between the greatest impact on intellectual and behavioral development. While research on the influence of environment on learning is not new, the idea that public spaces play a role in the development of the human was not formally researched until Danish architect, Jan Gehl, published his theory on public spaces in 1971. Nair and Gehling (2011), in response to Gehl's work, suggested, "We are motivated by social experiences: we enjoy watching other people, looking out for people we know, and some of us enjoy being watched" (p. 27). According to Gehl (1971/2011), there are ostensibly three types of activities that occur in public spaces: necessary activities, optional activities, and social activities; and well-defined spaces allow for all three activities to co-exist as "functional, recreational, and social activities intertwine in all conceivable combinations" (p. 14). He went on to note, "Life between buildings comprises the entire spectrum of activities, which combine to make communal spaces in cities and residential areas meaningful and attractive" (Gehl, 1971/2011, p. 14).

While much of Gehl's (1971/2011) work refers to outdoor spaces between self-contained buildings in an urban setting, the same ideas can be applied to the spaces that exist

between classrooms. Nair and Gehling (2011) advocated school designers apply Gehl's three main features of public spaces: marketplaces, which they associate with libraries, auditoriums, cafeterias, etc.; thoroughfares or hallways between destinations; and meeting places, spaces created to encourage sitting and conversing, such as benches or booths, to recapturing and reimagining the spaces between destinations as indoor public spaces. By departing from traditional spatial configurations, school designers allow students and teachers to explore learning environments that enable them to construct learning that better meets their evolving instructional needs (Gehl, 1971/2011; Nair & Gehling, 2011).

The Connection between Learning Spaces and Constructivist Learning Theory

Yilmaz (2008) identified three main domains of constructivism: sociological, psychological, and radical. Sociological constructivism is the idea that learning is constructed in a social context. Yilmaz stated, "social factors affect the ways in which groups of people form understandings and formal knowledge about their world" (p. 163). Psychological constructivism is grounded in the belief meaning becomes formal knowledge through construction by the learning community. Yilmaz contended, "If the individuals within the group come to an agreement about the nature and warrant of a description of a phenomenon or its relationship to others, these meanings become formal knowledge" (p. 163). Radical constructivism posits knowledge is the sum of learning experiences by the learner, and the learner constructs all knowledge through the lens of their own experiences and personal perceptions. In the constructivist learning environment, the teacher acts as the facilitator for learning, while the student is actively seeking new knowledge (Juvova et al., 2015; Liu & Chin, 2010; Scheer et al.,

2012; Kritzenberger et al., 2002; Yildirim, 2014; Yilmaz, 2008). This is a departure from the prevalent education model in which the teacher imparts information to students, while students passively receive it. According to Liu and Chin (2010), "this principle contradicts the traditional learning model where knowledge is simply transmitted from a more knowledgeable person to others" (p. 63).

As such, a constructivist learning environment must be hands-on, authentic, and grounded in real-life contextual experiences. Learners need space and opportunity to explore through application of sensory input. Spaces must be designed to optimize student learning, allowing students to "unconsciously begin to acquire a foundation for 'understanding' before they even know they know something" (Jensen, 2003, p. ix). Gehl (1971/2011) advised, "Familiarity with human senses—the way they function and the areas in which they function— is an important prerequisite for designing and dimensioning all form of outdoor spaces and building layouts" (p. 63). Attention must be given to designing spaces where students are free to make meaning, and where students are exposed to sensory stimulation (Jensen, 2003).

Yilmaz (2008) observed, "Constructivist theory is descriptive rather than prescriptive; it does not prescribe rigid rules or procedures for designing a learning environment" (p. 167). Scheer et al. (2012), stated,

> they need space to try out different mental models and methods to connect abstract knowledge with concrete applications and thereby, being able to convert and apply abstract and general principles (acquired through instruction) in meaningful and responsible acting in life (acquired through construction). (p. 10)

As established previously, however, constructivist learning relies heavily on social interactions and dynamic social situations in order to be meaningful and robust.

The Connection between Learning Spaces and Social Learning Theory

Early learning theorists, such as Pavlov and Skinner, focused on the behaviors of the learner as influenced by external factors; but it was Bandura who developed the theory that learning occurred in a social context (Goldhaber, 2000). Bandura's social learning or social cognitive theory proposed "human learning was primarily a social experience" (as cited in Goldhaber, 2000, p. 91). According to Bandura's theory, individuals learn through careful observations of modeled behaviors and resultant consequences (Goldhaber, 2000). Tudge and Winterhoff (1993), however, observed, "Bandura believes peers can be useful models," but "does not believe that peer interaction is necessarily more effective than child-adult interaction" (p. 70). Conversely, according to Goldhaber (2000), Piaget theorized peer interactions are instrumental in the acquisition of knowledge, because they "enable the child's cognitive operations to construct new knowledge without being overwhelmed by the power of an adult's arguments" (p. 345).

Vygotsky also suggested learning occurs in a social context, and learning is co-constructed (Goldhaber, 2000). Lui and Matthews (2005) noted, "A central concept in Vygotsky's theoretical system is the role of social collectivity in individual learning and development" (p. 391). They noted there is a connectivity for the individual to the collective group in both a historical and cultural context. As social context is essential to the underpinnings of Vygotsky's (1978) theory of learning, so therefore is the physical space in which learning occurs. Another significant component of Vygotsky's learning theory centered on what he calls the zone of proximal development (ZPD). Vygotsky defined ZPD as "the distance between the actual developmental level as determined by independent problem

31

solving and the level of potential development as determined through problem solving under

adult supervision or in collaboration with more capable peers" (p. 86). It is through scaffolds,

some of which are provided by social interactions, children are able to access learning in the

optimal zone of their individual proximity of learning (Goldhaber, 2000, p. 343). Learning

environments must provide fluid opportunities for students to access these scaffolds

effectively. As one of the key aspects of public space theory, the emphasis of social learning

theory on providing opportunities to engage in social interaction within learning environments

adheres to the tenets of the conceptual framework of this study.

Impact of Learning Spaces on Social and Academic Development

According to Booren, Downer, and Vitiello (2012), "Research suggests children's

interactions with teachers, peers, and tasks are critical to their academic and social outcomes"

(para. 4). Moreover, they contended, "Young children's relationships with teachers and peers

significantly predict school success: children who have warm, positive relationships tend to

have higher achievement, lower levels of internalizing behavior, and higher social competence

than children whose relationships are characterized by conflict" (p. 517). Goldhaber (2000)

contends constructivist and social learning theories are the social context of learning and a key

component of knowledge acquisition. There is a connection between learning, the learning

environment, and the social context in which learning occurs. As such it is imperative that

learning opportunities occur in stimulating spaces allowing for social interaction and knowledge

construction; spaces should be designed to optimize student learning, based on student needs

and development, and provide students with the ability to interact with other learners in ways that are meaningful for them (Goldhaber, 2000).

The Brain and Human Development

Research indicates the brain functions most efficiently and effectively in an environment that stimulates learning (Jensen, 2003; Lackney, 2006). Jensen (2003) noted, "Brain-friendly learning environments strengthen neural connections and aid long-term memory, planning, and motivation" (p. 41). The brain is a wondrous and complex organ comprised of millions of brain cells called neurons. Though these neurons never actually touch, they do communicate with each other through a chemical process known as synapses (Nussbaum & Daggett, 2008). These synapses are crucial to learning because they are the product of new information being processed by brain cells, and the more synaptic connections the brain develops, the healthier the brain will be (Nussbaum & Daggett, 2008). Another amazing quality of the brain is plasticity. Plasticity is what enables the brain to continue to develop over time (Nussbaum & Daggett, 2008). As the individual grows and develops, so does their brain; adapting to new contexts, and reshaping old contexts to fit new learning (Medina, 2014; Nussbaum & Daggett, 2008). The study of this process is known as developmental psychology, and over the years a number of theories have been generated through studying human development.

Most noted of these theories is Piaget's theory of cognitive development (Ronan & Freeman, 2007; Sroufe, Cooper, & DeHart, 1996). According to Piaget, all children experience the same sequence of discovery through similar trials and errors (Ronan & Freeman, 2007). Bruner (1977), referencing the work of Piaget and his contemporaries, suggested all students

are capable of learning if the information is presented in a manner that embraces their stage of development. The National Association for the Education of Young Children (NAEYC) recommended teachers provide a developmentally appropriate learning environment for elementary aged students that fosters "exploration, initiative, positive peer interaction, and cognitive growth" and provide a variety of spaces (as cited in Copple & Bredekamp, 2010, p. 293).

Learning Styles and Multiple Intelligences

Learning environments are noted for their relative influence in meeting students' optimal learning modalities. The terms learning styles and multiple intelligences are not synonymous, although for the purpose of the current study, they have similar needs from a learning environment. Both require flexible spaces that allow the learner to make personal choices in how they learn; and both influence how the learner interacts with their peers in the learning environment (Gardner, 1999; Nodoushan, 2014). Learning experiences that focus on learning styles and multiple intelligences provide opportunities for students to engage in "dynamic, multimodal learning, and flexible groupings of students and adult experts" (Campbell & Campbell, 1999, p. 97). They empower students to seek out learning experiences and peer groupings that best meet their individualized learning needs. Nair (2014) advised, "Classrooms are good for lecture and student presentations, but don't work for most of the other learning modalities, like team collaboration, independent study, peer-to-peer tutoring, and so on" (p. 68). In order to meet the diverse needs of students, teachers must provide a variety of learning environments.

Self-Efficacy

Variety in the learning environment also allows students to pursue activities at which

they feel they can be successful. Gregory and Kaufeldt (2015) observed, "People will engage in

activities if they believe that they are competent in them" and "will be more likely to engage,

persist, and succeed at tasks when they feel a sense of efficacy" (p. 22). Self-efficacy is the

standard to which an individual holds oneself (Goldhaber, 2000). The process of self-reflection

is a mechanism utilized so that students may gauge whether or not they have met this

standard. Students need time and space to reflect on personal performance and learning, as

well as to process new information.

Learning Spaces and Social Development

Smith and Semin (2007) defined social cognition as the study of

mental representations and processes that contribute to human social judgment and
social behaviors [and suggest], the theme that cognition is situated – not isolated in
inner representations and processes but casually interdependent with the current
physical and social environment – resonates with findings . . . that situations and
communicative contexts pervasively influence social thought and action. (p. 135)

Patrick, Ryan, and Kaplan (2007) asserted, "The association between perceived classroom

environment and student engagement is assumed by social-cognitive motivation theories to be

mediated by students' motivational beliefs" (p. 83). In other words, how the student perceives

the classroom environment in a social context influences their ability and willingness to engage

in learning opportunities. Kleberg (1992) reinforced this idea by stating,

We need to consider the transactional relationship among students and the physical
environment. The physical, chemical, biological and social which impacts students'
sensory modalities. Behavior is, we know, a function of the interaction of the individual
with their environment no matter where or what the activity. (p. 7)

Wright and Cowen (1982) suggested the perceptions of young children, as they relate to their learning environment, must be understood in order for them to "readily form complex abstract judgments about the nature of social environments" (p. 688).

The teachings of Dewey (1990) tell one learning is a social imperative, one that prepares students for experiences outside of the school. Learning, and the contexts and spaces in which learning occurs, should be tailored to provide students with opportunities to develop skills such as discourse and collaboration (Dewey, 1900; Lehmann & Chase, 2015; Montgomery, 2008; Robinson, 2015). Booren et al. (2012) found students "consistently displayed a higher prosocial peer behavior in all settings except for large group and occasionally routines and transitions" (para. 29). In highly structured settings, where the teacher was involved, there were fewer observable social interactions, fewer opportunities for self-reliant task behaviors, and lower task-oriented behaviors. Conversely, this suggests learning environments that allowed for more social interactions evidenced higher task-oriented behaviors and self-reliance.

In surveys administered by Rudd, Reed, and Smith (2008), 39% of students responded they most enjoyed learning in "social spaces in and around school" (p. 9). When asked about preferred ways to learn in school, 83% of respondents reported they prefer to learn while "working in small groups" (p. 15). Although this study was directed at determining if there was a difference in student perceptions when in a newly constructed building, there was little difference in the student responses when considering social contexts for learning (Rudd et al., 2008). McGregor (2004) purported, "The understanding here is of space as constituted through the social, with interactions creating social spaces. . . . However, society and organisations would not exist as we experience them if they were simply social" (p. 351). As such, it is the

social interactions that give meaning to the space. Space is, as McGregor (2004) defined it, "a passive container for social action" (p. 351).

Learning Spaces and Academic Development

Overwhelmingly, research has shown there is a connection between the quality of school facilities and students' academic outcomes (Ariani & Mirdad, 2016; Brooks, 2010; Lyons, 2001; Mendell & Heath, 2004; Ozerem & Akkoyunlu, 2015; Schneider, 2002; Tanner, 2008). Ariani and Mirdad (2016) claimed, "School design is the third angle of an educational triangle including teacher, material, and architecture" (p. 177). In their study of 150 students at two Iranian elementary schools, one public and one private, they found "Indoor and outdoor learning spaces such as comfortable paths and walkways, light sources, school's main building, and natural features of the landscape have impact on learning" (Ariani & Mirdad, 2016, p. 178). Interestingly, they noted private school students were more greatly affected by design classifications, as opposed to their public school counterparts, who "paid little attention to physical environment" (Ariani & Mirdad, 2016, p. 177). Regardless, they suggested, "Learning space as a strong component can motivate students to make progress" (Ariani & Mirdad, 2016, p. 178).

According to Ozerem and Akkoyunlu (2015), "Learning environments designed according to students' needs improve student motivation and success" (p. 64). Their research yielded positive relationships between student success and motivation when the learning environment was designed based on their learning style needs (Ozerem & Akkoyunlu, 2015). The authors presented a position that learning environments designed based on students'

needs provided "crucial exposure for students and helps students develop their repertoire of skills, knowledge, attitudes, and behaviors in order to meet 21st century competencies" (p. 64).

A 2003 comprehensive study presented by the Tennessee Advisory Commission on Intergovernmental Relations reported, "The quality of facilities has more of an effect on factors such as student attitudes toward school, self-esteem, security, comfort, and pro-social behavior, which in turn affects learning and achievement" (p. 8). Schneider (2002), upon reviewing facility elements that affect student outcomes, stated "School facilities affect learning. Spatial configurations, noise, heat, cold, light, and air quality obviously bear on students' and teachers' ability to perform" (p. 16). After studying school design features that had potential influences on student outcomes, Tanner (2008) reported, "Movement and circulation patterns significantly influenced the variance in Reading comprehension, Language arts, Mathematics, and Science scores. Spaces allowing freedom of movement and circulation correlated with better test scores" (p. 394). When looking at two groups of students, one receiving instruction in a traditional classroom and the other in an active learning classroom (ACL), Brooks (2010) found the students in the ACL outpaced the students in the traditional classroom (p. 6). As a result, he suggested, "physical space alone can improve student learning even beyond students' abilities as measured by standardized test scores" (p. 7).

Mendell and Heath (2004), in a review of literature related to indoor environmental factors that influence student performance found, "Suggestive evidence that certain conditions commonly found in U.S. schools, such as low ventilation rates, have adverse effects on the health and the academic performance of many of the more than 50 million U.S. schoolchildren" (p. 25). Likewise, a review of research conducted by Lyons (2001) also illustrated the connection

between school facility conditions and student achievement. Lyons stated, "Four recent studies that evaluated the relationship between school buildings and student achievement found higher test scores for students learning in better buildings and lower scores for students learning in substandard buildings" (p. 6).

Summary

Through the review of literature, I found most studies focused on the quality of spaces in learning environments—attending to daylighting, acoustics, ventilation, etc.—as opposed to the variety of spaces available for learning. While these are important design elements, they are not under the control of the campus administrator. Furthermore, many studies attended to learning spaces designed for post-secondary learning. These deficits in the research present both a challenge and an opportunity to explore an area of need in the research.

CHAPTER 3

METHODOLOGY

This chapter is an overview of the research methodology used in this study. It is

organized to provide clarity on the purpose, procedures, and rationale of the study as it

pertains to the field of education. The methodology also describes the campus profile and

participants chosen for the study, as well as an outline of the data collection timeline. In

conclusion, an explanation is provided to solidify the significance of the study and applicability

of the research in an educational context.

Research Question

As presented in Chapter 1, the objective of this study is to ascertain student and teacher

perceptions of the environment in which student learning takes place and their perceptions of

how it has helped them in the cognitive and social domains. I intend to answer the following

research questions:

1. What are student perceptions of the environment in which they learn in relation to
    cognitive and social development?

2. What are teacher perceptions of the environment in which they teach in relation to
    students' cognitive and social development?

3. What is the relationship between student and teacher perceptions of the
    environment in which learning takes place and its perceived influence on student
    academic development?

Research Design

The research design utilized for this project was qualitative case study. Cohen, Manion,

and Morrison (2005), posited "One of their strengths is that [case studies] observe effects in real contexts, recognizing that context is a powerful determinant of both causes and effects" (p. 181). Bryman (2012) identified five types of case studies used in qualitative research: critical, extreme/unique, exemplifying, revelatory, and longitudinal. According to Bryman, critical case studies are those through which the researcher is attempting to gain deeper understanding because of identifiable features of the case that may prove or disprove a particular hypothesis. As the objective of this research project was to ascertain student and teacher perceptions of learning and the environment in which student learning takes place and their perceived impact on student academic and social experiences, a critical case study model was applied.

Setting

The setting of this research study was an elementary school in Texas. To protect the anonymity of the school, the pseudonym Cecil J. Rowe Elementary is used to refer to the study site. Cecil J. Rowe Elementary is a Title I school, serving approximately 575 students in Grades Pre-K-6. The building was, originally built in 1970, opened to students in 1971. When opened, the school was an open concept school. In 1998, an addition was built, adding 23 classrooms, a gym, and a courtyard to the existing structure. At that time walls were added to the pre-existing building, creating 20 additional learning spaces, a teachers' lounge, and a library. Additionally, a pre-kindergarten pod containing three classrooms was built.

In the summer of 2014, all the white walls that make up the main corridors in the building were painted one of seven different bright colors: red, orange, yellow, yellow-green, violet, blue, and light blue. Each hall was numbered and large call-out bubbles illustrating Greek

41

and Latin roots were added throughout the building. An unused 50-foot corridor was reclaimed for a reading lounge; with eight rocking lounge chairs, two rolling book shelves, four large activity carpets, and more than a dozen floor cushions and lap desks.

In the spring of 2015, a makerspace was added to the library, recapturing approximately 300 square feet not previously used by students. Components of the makerspace include two 3-D printers, a large community loom, a button maker with button supplies, and several sets of Legos with an iPad set up for stop-motion photography and movie-making. Shortly after the opening of the makerspace, the under-utilized 1,000 square foot courtyard was renovated, adding a water and sand table, upright chimes, drums, and a water trough koi pond. Each space was designed for students and teachers to access at will. They were created with a consideration for flexibility and self-exploration.

A flexible learning lab was created in the spring of 2017. This space was designed to provide a variety of seating and standing options, allowing for the flexibility of instruction described by Nair (2014), with campfires, caves, and watering holes. Furniture was arranged to establish campfire and watering hole design elements using floor cushions, molded chairs, rocking stools, and bar height tables. A large play pod with shelving was installed, providing a cave space for students who needed to isolate themselves from their peers. A section of the space was also designated for students to build and explore through hands-on learning.

Participants

The student population at Cecil J. Rowe Elementary is highly diverse, with approximately 575 students representing 20 different home languages. Seventy-four percent of the school's

population is identified as economically disadvantaged, and 26% of the students are designated as English Language Learners (ELL). The school has a 29% mobility rate, attributed to the enrollment of students from three local shelters and the children of visiting students who attend a nearby university. The participants of the study are all students in Grades 5 and 6. Of the 143 students in Grades 5 and 6, 95 are economically disadvantaged, seven different home languages are represented, and 33 students are currently, or have recently been, designated as English language learners.

The teacher participants include seven teachers in Grades 5 and 6. Of these seven adult participants, one is male and six are female and all are White. Grades 5 and 6 are departmentalized at Cecil J. Rowe Elementary, so each teacher specializes in, and teaches, one to two subjects. Table 1 provides an overview of each participating teacher with their assigned pseudonym, years of experience, and grade and subject teaching assignment. To preserve anonymity, years of service are listed in ranges.

Table 1

Teacher Participant Overview with Years of Experience and Grade and Subject Assignment

	Grade 6			Grade 5	
Teacher	Subject	Yrs. of Exp.	Teacher	Subject	Yrs. of Exp.
1	Math	15 to 20	4	Math	0 to 5
2	Reading	15 to 20	5	Reading	15 to 20
3	Science/Social Studies	20 to 25	6	Science	0 to 5
			7	Social Studies	10 to 15

Ethical Considerations

As noted, consideration has been made to safeguard student and teacher confidentiality. To preserve anonymity, no student or participating teachers are identified by name. Attention was paid to ensure learning experiences are not harmful to the participants, and informed consent was obtained prior to initiating the research protocols. I complied with policies and procedures as set forth by the University of North Texas regarding data collection, analysis, and reporting, as well as those set forth by the district and school being researched. Communication with the district made clear the nature of the study and their right to withdraw from the study at any time.

Role of the Researcher

In this study, my role was to define the research process and obtain appropriate consent. I was also responsible for administering questionnaires, observing instruction, conducting interviews, and interpreting data. In this study, however, I held the dual role of being a campus administrator. Cohen et al. (2005) contended, "Case studies frequently follow the interpretive tradition of research–seeing the situation through the eyes of participants" (p. 183); therefore, the researcher is integral in the study process and must guard against bias. As Cohen et al. (2005) also recommended, "Researchers should acknowledge and disclose their own selves in the research . . . to monitor closely and continually their own interactions with participants, their own reaction, roles, biases, and other matters that might bias the research" (p. 141). Consideration was paid to the potentiality of biases regarding the interpretation of

data. Additionally, triangulation was employed in the form of multiple data collection methods: questionnaires, observations, and structured interviews.

Data Sources

Cohen et al. (2005) recommended using "semi-structured and open interviews, observations, narrative accounts and documents" as methods of research for a case study project (p. 189). The qualitative research methods used in this case study included: open-ended questionnaires, observations, and interviews. Surveys and questionnaires are in Appendixes A-C, observation protocols in Appendixes D and E, and teacher and student interview questions in Appendixes F and G. To realize influences fully that the learning environments have on students, socially and cognitively, one strategy used in this study was observations. Substantial supporting data was sought through the questionnaire and interview processes, which provided anecdotal evidence of social and cognitive development as applied to a variety of learning contexts.

Surveys and Questionnaires

While surveys and questionnaires are not commonly recommended to provide data for case study research projects, they were employed for the purpose of gaining pre-observation baseline data for the researcher (Cohen et al., 2005). Students were administered multiple choice surveys, one for each teacher. Table 2 is an example of the questions administered to students through the survey. The complete survey is in Appendix A. Students were also asked to complete an open-ended questionnaire seeking their perceptions of the learning environments

in their school. Table 3 is an example of the questions presented to students on the open-

ended student questionnaire. The complete questionnaire is in Appendix B.

Table 2

Examples of Student Perception Survey Items

Student Perception Survey Questions	Answers
I learn best in:	The classroom Informal spaces outside the classroom Formal spaces outside the classroom All the above
I am more comfortable learning in:	The classroom Informal spaces outside the classroom Formal spaces outside the classroom All the above
My teacher presents lessons in learning spaces outside the classroom:	Once a week Once a month Once a semester Rarely

Note: These survey questions were derived from sample questions provided by Learning Spaces and Learning Styles (2016).

Table 3

Examples of Student Perception Questionnaire Items

Student Perception Questionnaire Items
1. In what kind of space does your teacher feel most comfortable teaching? Why do you think so?
2. How well do you think your teacher uses the different learning spaces in the school?
3. How well do you think furniture is used in learning spaces in this school?

Note: These questionnaire items were derived from sample questions provided by Learning Spaces and Learning Styles (2016).

Teachers were administered one multiple choice survey and an open-ended questionnaire

seeking their perceptions of the learning environments in their school. The survey and

questionnaire responses enabled me to establish a baseline of perceptions relating to available learning environments in the school, and student and teacher perceptions related to opportunities for social interaction during learning experiences. Their responses assisted in gaining a better understanding of learning environments, and opportunities provided to students to engage in diverse learning environments and with their peers. The design of both the surveys and the questionnaires was based on sample questions provided on the Learning Spaces and Learning Styles (2016) website. Survey and questionnaire validity was ensured by monitoring the administration of the surveys and questionnaires as they were being administered. Accuracy was further determined through the interview process, asking probing and clarifying questions. Tables 4 and 5 are examples of the survey and questionnaire questions administered to teachers. The complete survey and questionnaire is in Appendixes A and B. Tables 6 and 7 are an example of how the student and teacher survey and questionnaire items coincide. The complete teacher survey and questionnaire is in Appendix C. The complete lists of how the student and teacher survey and questionnaire items coincide are in Appendixes H and I.

Observations

I conducted a series of observations, witnessing students engaging in a variety of learning environments. The purpose of the observations was to establish which specific student behaviors are evident in learning environments designed to provide optimum student learning, as outlined by Nair (2011; 2014), and identify learning environment characteristics deemed most effective for the social and cognitive development of students.

Table 4

Examples of Teacher Perception Survey Items

Teacher Perception Survey Questions	Answers
My students learn best in:	The classroom Informal spaces outside the classroom Formal spaces outside the classroom All the above
I am more comfortable teaching in:	The classroom Informal spaces outside the classroom Formal spaces outside the classroom All the above
I use learning spaces outside the classroom:	Once a week Once a month Once a semester Rarely

Note: These survey questions were derived from sample questions provided by Learning Spaces and Learning Styles (2016).

Table 5

Examples of Teacher Perception Questionnaire Items

Teacher Perception Questionnaire Items
1. Describe the best teaching environment for you.
2. How do you know what is the best learning environment for students?
3. How does a teacher's teaching style influence the use of learning spaces? How would you change them?
4. What do you think is the relationship between learning environment and learning outcomes?

Note: These questionnaire items were derived from sample questions provided by Learning Spaces and Learning Styles (2016).

Table 6

Examples of Teacher and Student Survey Questions Alignment

Teacher Perception Survey Questions	Student Perception Survey Questions
My students learn best in: • The classroom • Informal spaces outside the classroom • Formal spaces outside the classroom • All the above	I learn best in: • The classroom • Informal spaces outside the classroom • Formal spaces outside the classroom • All the above
I am more comfortable teaching in: • The classroom • Informal spaces outside the classroom • Formal spaces outside the classroom • All the above	I am more comfortable learning in: • The classroom • Informal spaces outside the classroom • Formal spaces outside the classroom • All the above
I use learning spaces outside the classroom: • Once a week • Once a month • Once a semester • Rarely	My teacher presents lessons in learning spaces outside the classroom: • Once a week • Once a month • Once a semester • Rarely

Table 7

Examples of Teacher and Student Perception Questionnaires Alignment

Teacher Perception Questionnaire Questions	Student Perception Questionnaire Questions
Describe the best teaching environment for you…	In what kind of space does your teacher feel most comfortable teaching? Why do you think so?
How do you know what is the best learning environment for students?	How well do you think your teacher uses the different learning spaces in the school?
How does a teacher's teaching style influence the use of learning spaces?	How well do you think furniture is used in learning spaces in this school?

Note. Learning Space and Learning Styles, 2016.

This protocol was based on Nair's (2014) "Design Elements that Define Educational Effectiveness:" spatial organization, the learning environment, personalization, technology, and interior design (p. 27). Regarding spatial organization, Nair recommended attending to scale, variety and flexibility, and informal learning areas. The learning environment encompasses lighting and acoustics; personalization refers to providing privacy and a *home base*; and interior design addresses furnishing, colors, materials and textures, clutter, and ethos and aesthetics (Nair, 2014). For the purpose of the current study, the observation protocol focused on spatial organization and interior design. Table 8 provides an overview of the learning environment protocol based on Nair's (2014) "Design Elements that Define Educational Effectiveness" (p. 27).

In addition to attending to the physical aspects of the learning experiences, the observation protocol also considered the social interaction opportunities provided to the students. The data were collected using a protocol derived from the Individual Classroom Assessment Scoring System (inCLASS) observation protocol (Downer, Booren, Lima, Luckner, & Pianta, 2010). This protocol is comprised of three domains that encompass nine dimensions (Downer et al., 2010).

- Domain 1: Teacher interactions, considers positive engagement with teacher, teacher communication, and teacher conflict

- Domain 2: Peer interactions, attends to peer sociability, peer communication, peer assertiveness, and peer conflict

- Domain 3: Task-orientation, speaks to the students' engagement with tasks, self-reliance and behavior control

Table 8

Learning Environment Observation Protocol

Design Elements	Design Sub-elements	Descriptors
Interior Design	Furnishing	Comfortable, ergonomic options available Varied based on individual student needs Safe and appropriate
	Colors	Complements the intended use of the space
	Materials and Textures	Varied based on space needs Provide for variety of activities: whiteboards, tack boards, etc. Floor surfaces support movement and comfort
	Clutter	Free of clutter and safe
	Ethos and Aesthetics	A sense of community
Spatial Organization	Scale	Accessibility of built or added features by student Size of space relative to occupants Space provides for social groupings
	Variety and Flexibility	Space provides for multiplicity of learning activities
	Informal Learning Areas	Provides for social or informal interactions to occur

Note: The selection of these focus design elements was derived from Nair's (2014) Design Elements that Define Educational Effectiveness.

For the purpose of this study, aspects of Domain 2 of the inCLASS protocol were utilized.

In addition to the inCLASS protocol, behaviors from the Social Interaction Observation Form

provided by the Lakes Country Service Cooperative (LCSC, 2016) were also employed. In

applying this protocol, I tracked these social interaction behaviors of individual students:

opportunities for peer communication, peer assertiveness, classrooms group activities, peers'

questions, and to engage in social conversation; as well as the frequency of appropriate peer

interactions, and the number of students who appeared to have preferred peers. Table 9

provides an overview of the learning environment protocol.

Table 9

Peer Interaction Observation Protocol

Observation of Peer Interactions	Frequency			
Opportunities for:				
• Peer Communication	Often	Occasionally	Rarely	Never
• Peer Assertiveness	Often	Occasionally	Rarely	Never
• Classroom Group Activities	Often	Occasionally	Rarely	Never
• Peers Questions	Often	Occasionally	Rarely	Never
Opportunities to:				
• Engage in Social Conversation	Often	Occasionally	Rarely	Never
Appropriate Peer Interactions	Observation Notes and Frequency Table			
# of Students Who Appear to have Preferred Peers	Frequency Table			
# of Positive Student to Teacher Interactions	Frequency Table			
Nature of Student to Teacher Interactions	Observation Notes			

Note: Derived from the Social Interaction Observation Form provided by the LCSC (2016), and aspects of Domain 2 of the Individual Classroom Assessment Scoring System (inCLASS) observation protocol (Downer et al., 2010).

Interviews and Focus Groups

Post-observation interviews were conducted, eliciting feedback from teachers regarding

their perceptions of the learning experiences. Interview participants were selected based on

observed learning experiences. Specific questions related to observed behaviors of students

and teachers, and aspects of the learning experiences I observed. The teacher interview

questions were aligned to student success on the assigned task and concept acquisition; and

focused on their perceptions of whether the enhanced learning space provided for student

academic development. Teachers were asked to reflect on the functionality of the space as it

related to the students' ability to grasp the concept presented, and how this learning

experience may have differed if presented in alternate learning environments. Table 10 outlines

the teacher interview questions.

Post-observation focus groups were conducted, eliciting feedback from students

regarding their perceptions of the learning experiences. Focus group participants were

comprised of three to four students, selected randomly, based on participation in the observed

learning experiences. Specific questions related to observed behaviors of students and

teachers, and aspects of the learning experiences I observed. Student questions focused on the

social interactions provided through the enhanced learning space. The students were also

asked to reflect on their comprehension of the concept presented and whether the learning

space provided more or less opportunities to be successful. Table 11 outlines the questions that

will be asked during the student focus groups.

Table 10

Teacher Post-Observation Interview Questions

Question #	Question

1	How did you think the class went?
	    a. What did you think worked well in this class?
	    b. How can you use what worked well in your next class?

2	Was this a typical class? a. If different, what made this class different from others you have taught?

(table continues)

Question #	Question
3	How did the learning environment support student learning? a. How would this lesson have been different if taught in a different learning space?

4	Were students allowed to work together during this lesson?
	    a. Did working with one or more other students help or hinder the student's success on the lesson? *Or,*
	    b. Would working with one or more other students have helped or hindered the student's success on the lesson?

5	How much of the lesson was teacher-centered (lecturing, demonstrating) versus student-centered (students working and thinking)? a. Who was doing most of the work in this lesson – you or the students?
6	How would your students evaluate the overall usefulness or value of this lesson?
7	If you could make one change to the learning environment, what would it be? Why?

Note: These interview questions were derived from sample questions provided by the Learning Spaces and Learning Styles (2016).

While the student focus groups will be insightful and beneficial to fully realizing the influence of the learning environment on the student, the teacher interviews will be critical in establishing whether or not the learning experience allowed for greater academic development on the part of the students.

Table 11

Student Post-Observation Focus Group Questions

Question #	Question
1	How did you think the class went? a. What did you think worked well in this class?
2	Was this a typical class? a. If different, what made this class different?
3	How did the learning environment support your learning? a. How would this lesson have been different if taught in a different learning space?

(table continues)

Question #	Question

4	Were you allowed to work with other students during this lesson?
	    a. Did working with one or more other students help or hinder your success on the lesson? *Or,*
	    b. Would working with one or more other students have helped or hindered the student's success on the lesson?

5	How much of the lesson was teacher-centered (lecturing, demonstrating) versus student-centered (students working and thinking)?
6	Who was doing most of the work in this lesson – you or the students?
7	Did you think the lesson, or what you learned, was useful?
8	If you could make one change to the learning environment, what would it be? Why?

Note: Derived from sample questions provided by Learning Spaces and Learning Styles (2016).

The interviews and focus groups were audio-recorded in order to support the process of data analysis; and these recordings were professionally transcribed. In addition to the audio recordings, written notes were used to document nonverbal communication not captured on the audio recording.

Procedures

Document Review

I conducted a review of all documents related to the study in order to obtain an in-depth understanding of student and teacher perceptions as they related to the influence learning environments have on students' social and cognitive development. Survey and questionnaire responses, observational field notes, and transcribed interviews were analyzed for the purpose of correlating findings with the conceptual framework of this study and its research questions. All recordings, notes, and other documents related to this study will be

kept on a remote storage device and secured in a locked filing cabinet. In keeping with federal

regulations, participant information will be maintained for 3 years, and then properly disposed

of at the end of the 3-year period.

Research Steps

Once approvals were obtained and participants chosen, the next step was to obtain

informed consent from all participants in the study. Once consent was obtained, I administered

surveys and questionnaires to teachers and students. These surveys and questionnaires

established a baseline of expected perceptions regarding learning environments and

experiences, which were used to develop the observation protocol. I observed the students and

teachers as they participated in genuine learning experiences in a variety of learning

environments. After reviewing the observation notes, I engaged in post-observation interviews

to acquire feedback from students and teachers about the learning experience and how their

experiences aligned with, or differed from, their previously established perceptions.

Collection Timeline

The first step was to obtain approval from the University of North Texas Institutional

Review Board (IRB) to conduct the research along with approval from the district the study was

conducted in. A copy of the IRB approval is in Appendix J. I then obtained informed consent

from students and teachers to participate in the research study. A copy of the informed consent

forms is in Appendix K. I administered questionnaires in spring 2017 and conducted

observations and interviews shortly thereafter. The analysis of artifacts occurred after the collection and review of documents.

Data Analysis

I sought to ascertain student and teacher perceptions of the environment in which student learning takes place and their perceptions of how it has helped them in the cognitive and social domains. I investigated diverse learning environments, student and teacher perceptions of the social impact learning environments have on students, and student and teacher perceptions of the academic impact learning environments have on student learning. During and after the data collection process, I adhered to specific procedures in order to understand and make meaning of the data involved in this study. This included analyzing collected data, and identifying emerging patterns from the data analysis process.

For this study, the student and teacher survey questions align to one another; therefore, analysis of the surveys consisted of comparing responses from the student surveys to those of the applicable teacher surveys in order to identify relationships and similarities in their responses. Although the questionnaires and interview questions are also aligned, the variance inherent in open-ended questions required a data reduction process in order to analyze the data. Cohen et al. (2005) recommend coding as a process generally used to prepare data for analysis (p. 265). Table 12 outlines the preset categories and corresponding codes derived from the conceptual framework and aligned to the research questions in this study.

Table 12

Categories and Corresponding Codes

Code	Category
SC	Student Choice in Seating
TC	Teacher Choice in Seating
PR	Positive Responses to Learning Space
NR	Negative Responses to Learning Space
TCE	Teacher Comfort in Environment
LCE	Learner Comfort in Environment
PPP	Positive Peer-to-Peer Interaction
NPP	Negative Peer-to-Peer Interaction
PST	Positive Student-to-Teacher Interaction
NST	Negative Student-to-Teacher Interaction
SSG	Student Choice in Student Grouping
TSG	Teacher Choice in Student Grouping

Research triangulation is defined by Cohen et al. (2005) as "the use of two or more methods of data collection in the study of some aspect of human behavior" (p. 112). For the purpose of this study a methodological triangulation was applied to making meaning from the data collection sources. This process of methodological triangulation seeks to find a "convergence between independent measures of the same objective" (p. 114).

At the conclusion of the survey and questionnaire administration, questionnaire responses were coded, and the data analyzed and organized into the preset categories. Following the classroom observations, the observation documents were coded, and the data analyzed and organized into the preset categories. After each in-depth interview and after each of the focus group interviews, recorded responses were transcribed, and the data analyzed and organized into the preset categories. Frequency tables were used to identify patterns within the categories. These patterns were analyzed to find comparative similarities and differences in the

student and teacher data, which ultimately translated to themes. Summaries of the themes were written and analyzed to determine if any larger themes existed.

Rationale

Learning environments must adapt to changes in student learning modalities and industry standards. It is imperative schools attend to the learning needs of students, including what learning environments are most predictive of student success. This study will provide useable data supporting administrative decisions to seek more conducive learning environments for students. It will support and justify initial investments in furnishing and reallocation of facility spaces directed at providing more conducive learning environments.

Summary

In this chapter, I presented a research agenda that supports the research design of this study. This research study was qualitative in nature and I examined the influence of learning environments on social and cognitive development in students. Research was conducted during the spring semester of 2017 and included an analysis of documents generated from open-ended questionnaires, observations, interviews, and document analysis. A variety of learning environments were observed to determine how students respond to learning in environments other than the classroom. Student behaviors were observed to determine levels of engagement, concept acquisition, and positive social interactions.

In Chapter 4, I presents the results of the study. Chapter 5 is a discussion of the research findings and conclusions based on the results of the study; I discuss the implications of the study, and makes recommendations for further research related to the topic.

CHAPTER 4

RESEARCH FINDINGS

This case study was designed to determine student and teacher perceptions of the environments in which student learning takes place and their perceptions of how these spaces influence students' academic and social development. In this chapter, I present the findings of the data collected though student and teacher perception surveys, student and teacher perception questionnaires, classroom observations, student focus group discussions, and teacher interviews. Using the research questions and conceptual framework as a guide to analyze the collected data, the following themes were identified as a lens through which to organize and examine research findings: student interactions, students' autonomy in personalizing their learning space, teacher perceptions of comfort in the learning environment, and student perceptions of comfort in the learning environment. The conceptual framework of this study was constructed through the tripartite lens of constructivist learning theory, social cognitive theory, and public space theory with specific emphasis placed on public space theory. Using the three theories together, I explored the sociological, academic, and environmental context in which students learn, and the influence these factors have on student and teacher perceptions about the ways students take in and process new information.

This study was designed to investigate diverse learning environments, and student and teacher perceptions of the social impact learning environments have on student learning. It was also intended to examine student and teacher perceptions of the academic impact learning environments have on students. Consideration was given to contributing factors that related to how students learn, how teachers facilitate learning in different settings, and the role and

influence of peer interaction on learning acquisition. I intend to answer the following research

questions:

1. What are student perceptions of the environment in which they learn in relation to cognitive and social development?

2. What are teacher perceptions of the environment in which they teach in relation to students' cognitive and social development?

3. What is the relationship between student and teacher perceptions of the environment in which learning takes place and its perceived influence on student academic development?

Through the administration of student and teacher perception surveys and

questionnaires, classroom observations, post-observation interviews and post-observation

focus groups, study participants shared their perceptions of their learning environments. The

research presented in this chapter is based on an analysis of these data sources. Table 12 in

Chapter 4 outlined the preset categories and corresponding codes derived from the conceptual

framework and aligned to the research questions for this study. These a priori codes were

applied to the data sets to analyze and organize data into categories.

Background

The participants in this study were comprised of 4 fifth grade teachers, 3 sixth grade

teachers, 32 fifth grade students, and 36 sixth grade students. Participating teachers ranged in

age from 25 to 62 years old; one was male and six were female. Collectively the participating

teachers have an average of 15.3 years of experience, with two teachers having between 0-5

years of experience, one teacher having between 10-15 years of experience, three teachers

having between 15-20 years of experience, and one teacher having between 20-25 years of

experience. All teachers were departmentalized and taught single-subject courses. The students in the study ranged in ages from 10-12 years old and came from a variety of cultural and ethnic backgrounds. The students who participated in the focus group were selected at random using a random selector app; and represented a diversity of educational programs, including gifted and talented, Section 504, and English learners. There were four male and three female student focus group participants in the sixth grade, and three male and three female student focus group participants in the fifth grade.

The learning environment also played a substantial role in this research study. All of the sixth grade teachers were observed teaching in their classrooms, whereas two fifth grade teachers were observed teaching in their classrooms, one fifth grade teacher was observed teaching in the Flex Lab, and one fifth grade teacher was observed teaching in an informal learning space. The student and teacher survey and questionnaires reference the following learning environments: the classroom, the library, the computer lab, the science lab, the MakerSpace, the Reading Lounge, the courtyard, and the Flex Lab. The former four spaces are environments that were preexisting in the school prior to the 2014-2015 school year and the latter four spaces have been added since then.

Interviewees, focus group members, and other data sources contributed differing amounts of information to the four identified themes. Some themes are more evident in some data sources than others, and some of the themes are equally evident in all data sources. This narrative comprises an overview of all data sources as applicable to each theme.

Themes

As a result of this analysis, four themes were identified as applicable to this research problem: student interactions, students' autonomy in personalizing their learning space, teacher perceptions of comfort in the classroom, and student perceptions of comfort in the classroom. While the themes are reported as being exclusive, several themes occur concurrently in the data sources, and are addressed in alignment with each other. In all themes student and teacher input is considered together and independently. As such, the data are presented as it most logically aligns with, and supports, each individual theme.

Theme 1: Student Interactions

Social cognitive theory speaks to the internal factors that motivate learning, particularly those factors that influence how students interact with each other and how that interaction influences their learning. The interactions of students with one another in their learning environment was a key component of the conceptual framework of this study, and ties directly to the study questions attending to student and teacher perceptions of the learning environment in relation to students' cognitive and social development. The study findings provide insight into student interactions and speak directly to the research questions. They attend to internal factors such as learning style and self-efficacy, as well as external environmental factors that affect their learning.

This theme is most evident in the student and teacher survey responses, and the interview and focus groups, as student interaction is specifically addressed in these data sources. Table 13 shows, in response to the survey prompt, "I get to work with other students,"

31% of fifth grade respondents and 44% of sixth grade respondents, responded with "daily."

However, when teachers were given a similar survey prompt, "My students work with other

students," 100% of teachers responded "daily." Therefore, there is either a substantial

discrepancy between what teachers perceive to be happening and what students perceive to

be happening in regard to where learning is occurring, or there is confusion about what

constitutes student interaction.

Table 13

Student and Teacher Perception Survey Responses to Questions 4 and 6

Student Perception Survey					Teacher Perception Survey		
Q4-I get to work with other students					Q4-My students work with other students		
	5th Grade		6th Grade				
Responses	#	%	#	%	Responses	#	%
Daily	10	.3125	15	.4411	Daily	7	100
Once a week	16	.5	8	.2352	Once a week	0	0
Once a month	4	.125	1	.0294	Once a month	0	0
Rarely	2	.0625	10	.2941	Rarely	0	0
Q6-I learn better when working with other students					Q6-My students learn better when working with other students		
Responses	#	%	#	%	Responses	#	%
Strongly Disagree	1	.0312	2	.0522	Strongly Disagree	1	14.3
Disagree	0	0	1	.0294	Disagree	1	14.3
Neutral	10	.3125	12	.3529	Neutral	1	14.3
Agree	12	.375	10	.2941	Agree	4	57.1
Strongly Agree	9	.2812	9	.2647	Strongly Agree	0	0

The responses were more diverse when asked if students learn better when working

with other students. Table 13 illustrates student responses ranged heavily in the *neutral*, *agree,*

65

and *strongly agree* range; whereas teacher responses ranged from one response each in *strongly disagree*, *disagree*, and *neutral*, and four responses for *agree*. A significantly smaller percentage of students feel they learn better when working with peers than teachers feel students learn better when working with peers.

The focus groups and teacher interviews also provided significant insight into student interactions. During the sixth grade student focus group, the students were asked whether they were allowed to work with other students during the observed lesson. Initially when responding, all of the sixth grade students responded they were not allowed to work with other students. The interviewer followed up with three students who were observed in their math class and posed the following question:

> Okay, those of you that were in math, I want to go back to that because, you all three said that no, you didn't get to work with other students, but in this particular observation that I was in, there were . . . over 50 student-to-student interactions that took place. And on multiple instances I saw students that were getting up and moving and asking questions and helping other students. Was this a non-typical class that I observed in math? Number two, does that typically happen in math? Do you typically have the freedom to get up and move around in math?

Following this line of questions one student responded with, "Sometimes. Yeah, he usually lets us if we're being good. And most of the time that we're in math, he lets us walk around and help other people if you're done. Most people don't get done." Another student responded, "Sometimes we get to . . . it's usually whenever people are asking for help on their assignments." The third student responded, "What he usually doesn't like is if you're not talking about math. If it gets too loud, he makes us stop talking or if he hears that the conversations are not about math, he gets mad and makes us stop talking."

The students were then asked, "When working with one or more students, do you feel like it helps or hinders you? Does it help you to work with other students on assignments?" Three students responded that it helped and one responded that it did not. The student who responded that it did not help stated,

> I don't think it'll help. Because, there's more interactions going on the more people you're with. And just my opinion, I don't think that it's good. Cause I only usually get help from the teacher or somebody next to me. And if we start getting too into the conversation, I'll get distracted and won't be able to work. So, I like to work by myself.

The students who responded that it did help stated when they didn't know something, a classmate could help them and when a classmate didn't know something, they could help their classmate. This sense of self-efficacy ties in to the social cognitive theory, where students manage their own learning and self-regulate how best to learn.

Although fifth grade responses to the question, "Were you allowed to work with other students during this lesson?" were similar to those of the sixth grade students, responses to the question, "Did working with one or more students help or hinder your success on the lesson?" were considerably different. While the sixth grade students responded that working with another student could be mutually beneficial, the fifth grade students felt it was most beneficial to work with groups of four or more. According to their focus group responses, when there are three or fewer students in a group there is a higher likelihood of arguing than if there are four or more members of a group. One student, however, suggested, "For me it helps, but it just depends on who it is."

Teacher responses to "Were students allowed to work together during the lesson?" and "Did working with one or more other students help or hinder the student's success on the lesson?" closely mirrored student responses in both grade levels. One teacher responded, "For

some students, it is just what is needed. Others prefer to work alone." Another teacher

observed, "Working together in most cases always helps the students; they can give each other

support and feedback." Two other teachers commented on the idea-sharing aspect of students

working together, stating, "Students were able to bounce ideas off of each other and use that

information to increase their knowledge and produce work that was much better than they

expected" and "Most of the time this allowed problems to be corrected without adult

intervention." This ability to exercise personal preferences in shaping students' learning

experiences speaks to constructivist learning theory which purports when students are able to

create their own learning opportunities their learning is more enriched and relevant.

In addition to the other data sources, classroom observations yielded a varying degree

of student interactions. During one sixth grade reading class there were two observed instances

in which students interacted with each other. In the sixth grade math class, there were 74

observed instances in which students interacted with each other. In the sixth grade science

class, there were four observed instances in which students interacted with each other. In

almost all instances the interactions were academic and not social. The four fifth grade classes

were equally varied in the amount of student interaction. The math class had one student

interaction, social studies and reading classes had on-going student interaction, and the science

class had 16 instances in which the students interacted with each other. Public space theory

supports spaces as opportunities for social interactions. Spaces should be designed to allow for

individuals to engage in casual conversations—to see, hear, and experience others. Classrooms

are typically not considered public spaces and therefore do not provide the opportunities

spaces outside the classroom might provide for these types of interactions.

Both observed lessons with on-going student interaction were held in spaces outside of the traditional classroom. While the classes with on-going student interactions were the only classes that exhibited negative peer-to-peer interactions, they also exhibited the most student autonomy and freedom of movement. In both classes the teacher acted as a facilitator, and at times a mediator. While the negative interactions impeded academic progress on the assigned tasks, they also provided an opportunity for the teacher to guide the students on how to work through their conflicts in a controlled environment.

Distractibility

Although less evident in most of the observations, another aspect of student interaction referred to in the data sources is distractibility. Student and teachers make a number of references in the questionnaire responses to students losing focus and being distracted when attending learning in less formal learning environments. When asked, "What is the relationship between learning spaces in the school and how well you learn?" eight students noted it depended on the distractions and the noise level in the learning space as shown in the examples in Table 14. A complete list of the student and teacher responses are in Appendix L.

When asked, "What is the hardest part of learning outside the classroom?" 22 out of 75 students referenced some level of distraction, losing focus, or difficulty staying on task. An additional seven students referenced the noise level in the spaces, and nine students mentioned their peers off-task behavior. When asked of the teachers, "What are the greatest challenges about teaching outside the classroom?" three teachers noted distractions, two referenced noise levels and three identified managing student behaviors.

Table 14

Examples of Student and Teacher Perception Questionnaire Responses: Relationship between Learning Spaces/Environment and Outcomes

Student: What do you think is the relationship between learning spaces in school and how well you learn?	Teacher: What do you think is the relationship between learning environment and learning outcomes?
• I think the relationship is, that when we are relaxed we read better. But when we have more tension, we work better when we are at a desk. • You can probably learn about different things of how they are used or learn more about why they put the learning space there. • The differences are what type of learning it is and I learn pretty well. • It helps you learn better. • They can help us learn even more. • They both help us learn, in different ways. • I think we learn more because we are more focused than being in a chair every day in the class rooms. • They help you with your creative side being nice and colorful may give some of us ideas. • It depends on how quiet it is.	• The learning environment affects the learning outcomes. If the learning environment is helpful and useful for the child then as a result the child will learn. • Learning environment to me is a place that students feel safe, can engage and participate in the learning process, are free to investigate and question, find relevance in the objectives, and develop a desire to be lifelong learners. It is not so much about a "space" as an environment. I relate it to "church is not about a building, it's about the people inside the building and what is taking place in the hearts and minds of those participating." • I think students learn best when the environment is consistent and safe. When students trust their teacher and believe that they have their best interests in mind, outcomes are normally positive.
• The learning spaces sometimes distracts us. • Strong but the people who have ADHD can have a no distraction area. • I think I learn more in the reading lounge but in the fun place it is too loud and I get off task. • The seating arrangement might distract a lot of people.	

Note: Student and teacher responses are grouped by like responses respectively.

During the sixth grade focus group, four students self-identified as being distracted during the classroom observation. One student stated, "It was kind of hard to focus 'cause the people around me were talking kind of, like, they were all whispering and wouldn't be quiet." Another student shared,

> Okay, so it was kind of hard to focus. The person also next to me, she was trying to give me a note and try to talk to me and I was trying to focus on who was presenting. It was kinda hard because people around me were talking and whispering. All I could hear was whispering everywhere. I was engaged but I wasn't engaged. I was focused but I was not completely focused.

A third student responded, "I was a little distracted because of the seat I was put in by the teacher wasn't the best cause I was sitting with someone that I talk to a lot." The fourth student attributed their distractibility to "Sometimes I zone out or basically day dream. I'm not that focused." Examples of student and teacher responses are in Table 15. A complete list of the responses is in Appendix M.

Table 15

Examples of Student and Teacher Perception Questionnaire Responses: Greatest Challenges Outside the Classroom

Student: What is the hardest part of learning outside the classroom?	Teacher: What are the greatest challenges about teaching outside the classroom?
• not being able to concentrate some times • easy to lose focus • that you are going to get distracted • you get distracted • Everyone running around and not paying attention. • the noise in the hallway • to focus • There are a lot of distractions.	• Distractions, noise level of my students as they are learning, and interruptions have been the biggest challenges. • It was also very distracting when classes or individuals walked by. I thought we could learn to ignore it, but without success. • Distractions would almost certainly increase

The most observed student interactions, academic and social, occurred in learning spaces outside the classroom. Students in classrooms in which choice was provided in seating did not engage in more peer-to-peer interactions during the observations. Conversely, with the exception of the sixth grade math class, in four of the five observed lessons that occurred in the classroom, there were significantly fewer student interactions. Furthermore, during the focus groups, students reported to be equally distracted, or unfocused, in the classroom and in the alternate learning spaces.

Some of this distractibility is attributed to students' lack of control over personalizing the learning environment. Some students preferred options on choosing where and by whom they sit, selecting comfortable seating, and self-selecting whether to work in groups or alone, all of which tie directly into the second theme regarding personalizing their learning space.

Theme 2: Students' Autonomy in Personalizing Their Learning Space

Student autonomy in personalizing their own spaces for learning resonated through many of the data sources. Student perceptions of their ability to personalize their own learning environment speaks to the research question regarding the relationship between student and teacher perceptions of the environment in which learning takes place and its perceived influence on student academic development. A great deal of discussion took place in the student focus group on their desire to have seating that was designed for better comfort. When asked whether they would prefer desks or tables, one student responded, "If you have a desk, you have your own personal space. You can do whatever you want, but on a table you're kind of sharing with the people that you're sitting with." Another student noted, at a table "you

72

don't have anywhere to put your stuff except for on the floor right beside it and you just don't

have any privacy sitting like that." A third student agreed, saying, "You need your own privacy.

And some people like to work alone and quiet."

When asked "If you could make one change to your typical learning environment, what

would it be?" five of the seven responses referenced changes to the desks and chairs, with

three responses stating they would like bigger desks with more room for storing their personal

items. In response to questionnaire item "What would you change in the learning spaces of this

school?" almost 25% of the responses were about furniture, specifically asking for "more

comfortable seating," "better furniture," "taking away the chairs," and "more sitting options."

Seven responses requested "more space" that was "less crowded," and four requested a

change in the noise of the spaces, either to be "a little bit quieter" or for there to be music.

Teacher responses resonated with the students' responses listing: "Better/more seating

for outside learning," providing funds to teachers to create "flexible seating/desks . . . and areas

of the room for discovery and investigation." One teacher noted, "Sixth grade students are big

and take up a lot of space," and a third recommended a space "where noise is not an issue."

Examples of the responses from the students and teachers are in Table 16. A complete list of

the responses to these questions are in Appendix N.

When asked to "Describe the best learning space for you," several students identified

structural strategies put in place by their teacher to help personalize their learning space, such

as bungee cords, standing desks, floor pillows, and floor height desks. Similarly, when asked of

the teachers to "Describe the best learning spaces for your students," one teacher responded,

"My students prefer selecting where they want to sit (chair, floor, or standing)." Another

teacher responded, "Relaxed seating options such as standing, laying down, or sitting on the floor." Examples of the responses from the students and teachers are in Table 17. A complete list of the responses to these questions is in Appendix O.

Table 16

Examples of Student and Teacher Perception Questionnaire Responses: Changing Learning Spaces in the School

Student: What would you change in the learning spaces of this school?	Teacher: What would you change about the learning spaces in this school? How would you change them?
• I would change the amount of furniture so people wouldn't fight over it and be so load and distracting because learning spaces are where you learn and have fun at the same time not fight over furniture • If we had better furniture and more time over there	• Better/more seating for outside learning • Give teachers funds to create learning spaces in their classrooms. (flexible seating/desks, areas of the room for discovery and investigation)
• We would have more space to learn • I would want to have more space because in our class there is a lot of kids, so more space would be awesome • Add more space in the lounge	Sixth graders are big and take up a lot of space. It is difficult to use some of the spaces just because of that.
• For it to be little bit quieter • quieter voice level • Not always quiet. • That you could listen to music while testing so you can understand better	Where noise is not an issue
• I would let all the grades have a day to go there. • I would change our accessibility, we don't get to really learn in the learning spaces very often. . . . • Make them more reliable and often used • And I'd also like to visit them more	Our spaces also need a supply area for commonly used office supplies and clipboards (the clear plastic ones so kids can see instructions through the board and aren't constantly flipping them over). Clipboards are a must since once the kids get going, there aren't always suitable writing surfaces.

Note: Student and teacher responses are grouped by like responses respectively.

Table 17

Examples of Student and Teacher Perception Questionnaire Response: Best Learning Spaces

Student: Describe the best learning space for you.	Teacher: Describe the best learning spaces for your students.
• The flex lab • The flex lab. • The flex lab, because I can easily learn in an easy way but still have fun doing it.	Spaces where they can explore, question, investigate, and be active participants in the learning process . . . an environment, NOT A SPACE !!!!!
• Classrooms so that when I'm learning I don't get distracted. • The classroom is the best place because it is quiet and peaceful • Mrs. Smith's room. • In my homeroom class at my special desk • Her classroom because its quiet in her class • In the class room. • In a classroom or someplace that isn't loud. • The best learning space for me is in Mr. Lee's class	• My classroom • I believe that from day to day, the best place for students to learn math is in a controlled environment. However, if the learning space included opportunities to use everyday math to build or create, it could also be helpful to cause math to come alive to the student.

It is noteworthy that 44 out of 82 students listed a learning space outside the classroom as the space in which they learn best, as opposed to the 15 respondents who identified the classroom as the space in which they learn best. When given the option to self-select their learning environment, most students would not choose to learn in the classroom. A majority of teachers also identified spaces outside the classroom as the best learning spaces for their students, indicating a mutual understanding of the educational benefits of students being able to learn in an environment of their choice. However, despite the teachers' evident awareness that spaces outside the classroom provide learning benefits, a number of students noted they don't use the alternate learning spaces in the school. One student stated, "I would change our

accessibility, we don't get to really learn in the learning spaces very often," while another

observed, "make them more reliable and often used." While most of the teachers note

students learn best in a variety of settings, they do not address the fact they are the reason

students are not given more access and exposure to diverse learning environments.

Why learning does not consistently occur more often outside the classroom, by all

teachers, may be further addressed in Themes 3 and 4, which attend to teacher and student

perceptions of comfort in their teaching and learning environments. Teacher perceptions of

comfort in the classroom and student perceptions of comfort in the classroom seem to be the

themes with the most robust data. As such, they provide the most insight into overall teacher

and student perceptions related to learning spaces and how they attend to student social and

academic development. A great deal of discussion involved what teachers believe to be the

best learning environment for students and what students believe to be the best teaching

environment for teachers. There was also considerable discussion around what factors

contributed to making these environments comfortable for teachers and students.

Theme 3: Teacher Perceptions of Comfort in the Classroom

The initial input from teachers regarding levels of comfort in the classroom was through

survey and questionnaire responses. When given the prompt, "I am more comfortable teaching

in," three teachers responded with "the classroom," two of which were sixth grade teachers as

shown in Table 18. One teacher responded she was more comfortable teaching in an informal

space and the remaining three teachers responded with "all of the above," meaning the

classroom, informal learning spaces outside the classroom, and formal learning spaces outside

the classroom.

Table 18

Teacher Perception Survey Responses to Question 2

Responses to "I am more comfortable teaching in…"	#	%
The classroom	3	42.9
Informal spaces outside the classroom (such as the reading lounge and courtyard)	1	14.3
Formal spaces outside the classroom (such as the science lab or computer lab)	0	0
All the above	3	42.9

When asked to "Describe the best teaching environment for you" in the teacher

questionnaire, fifth grade teachers listed "alternative learning spaces," "open areas that aren't

crowded and allow movement," and "An environment where I have flexibility to encourage

exploration and creativity, usually a more informal learning space" as shown in Table 19.

Conversely, the sixth grade teachers expressed a preference for their own classrooms, "with as

few distractions as possible."

Table 19

Teacher Perception Questionnaire Responses to Best Teaching Environment

5th Grade Teachers	6th Grade Teachers
I prefer the alternative learning spaces. The students are excited and therefore more engaged. It improves the quality of their work and their retention.	My classroom in which flexible seating is available, as well as room for a classroom library and small group area is important.

(table continues)

5th Grade Teachers	6th Grade Teachers
Multiple areas to utilize multiple formats and various seating choices for students. Open areas that aren't crowded and allow movement.	An environment with as few distractions as possible
An environment where I have flexibility to encourage exploration and creativity. Usually a more informal learning space.	An environment where I am given the freedom to use my strengths, personality, passions, and philosophy of teaching to my potential. The "place" is not as important as the "climate" I am allowed to create with my students. Each of us brings into our profession talents and abilities that are unique to us. When forced to adhere to someone else's idea of "what works," it weakens and demeans our ability to teach our students with excellence.
Organized and spacious. The students and I know where everything is and the students can move around the room while learning.	

A notable topic of comments attending to comfort involved access to resources. As evidenced in Table 15, on the questionnaire, several references were made to the availability of items more conveniently accessible in the classroom, with responses such as "access to materials," "Not having all the supplies that you might need" and "lack of resources." One teacher noted she usually tries to keep "nurses passes, extra supplies (dry erase markers, Kleenex, etc.), but they always disappear." On the question "What would you change about the learning spaces in this school? How would you change it?" one teacher observed, "Our spaces also need supply areas for commonly used office supplies and clipboards." Student perceptions appear to align with this concern regarding resources, as Table 15 illustrates a number of students also referenced the lack of resources in learning spaces outside the classroom. One

teacher, however, also referenced resolving the issue, when discussing the greatest challenges of teaching outside the classroom, by bringing supplies to the alternate learning spaces.

Also evidenced in the survey was the teachers' perception of where students are more successful learning. In response to the prompt, "My students are more successful at learning when sitting at desks" three of seven teachers indicated *neutral*, *agree*, and *strongly agree* as shown in Table 20.

Table 20

Teacher Perception Survey Responses to Question 5

Responses to "My students are more successful at learning when sitting at desks."	#	%
Strongly Disagree	1	14.3
Disagree	3	42.9
Neutral	1	14.3
Agree	1	14.3
Strongly Agree	1	14.3

Interview responses to the question, "If your students could make one change to the learning environment, what would it be? Why?" illustrated teacher perceptions of what they believe students would change about the spaces in which they learn. A common response was the students would want to move more and have greater access to technology. Two teachers responded they would want to "eliminate the uncomfortable desks and chairs and increase the 1/1 technology ratio," and "probably move around more while using more technology." Another teacher suggested they would want "more movement, more projects to increase student buy-in and choice." A third responded, "More freedom to learn and work in a way that suits their needs. The students have been trained in the sit-and-get method so they had a

difficult time when it came to freely creating." She went on to observe, "Once they become

comfortable with their new freedom, they produce outstanding work." Yet another responded,

"Probably a larger classroom. I have a fairly mixed group of students each year. Some like to

move to an area of the classroom by themselves, and others enjoy the ability to collaborate

with their peers."

When considering alignment between teacher and student responses to a similar

question on the questionnaire, as illustrated in Table 16, teacher perceptions were in line with

what many students identified as possible changes they would make to the learning spaces in

the school. Several students identified more opportunities for movement, different furniture,

and more space as changes they would recommend. Student and teacher perceptions were

also aligned in their observations that limited resources in the alternate learning spaces created

a number of challenges to learning outside the classroom. However, despite these challenges

there is consensus that student learning outcomes benefit from the perceived comforts

provided by diverse learning environments.

Comfort and Learning Outcomes

Comfort is also attributed to learning outcomes in the response of the fifth grade

reading teacher to the question, "What do you think is the relationship between learning

environment and learning outcome?"

> Our students are constantly barraged with new information and exciting, visually
> stimulating experience via their personal technology. Our traditional classrooms and
> uncomfortable desk inhibit our students. I also think it's important to note that our
> students' home lives are much less structured than our generation. They do not have
> clearly defined eating spaces, study spaces, or living spaces. Instead, all their boundaries
> blur and are much more flexible than we experienced as children. I think that

accommodating children to multi-use areas, comfortable seating, and visually appealing spaces that vary tasks away from traditional pencil/paper task increase student interest. As a result, I spend less time re-teaching and I'm able to truly focus on student deficits.

Table 21 shows teacher responses to the question stated above.

Table 21

Teacher Perception Questionnaire Responses

Responses to "What do you think is the relationship between learning environment and learning outcomes?"
Learning environment to me is a place that students feel safe, can engage and participate in the learning process, are free to investigate and question, find relevance in the objectives, and develop a desire to be lifelong learners. It is not so much about a "space" as an environment. I relate it to "church is not about a building, it's about the people inside the building, and what is taking place in the hearts and minds of those participating."
The learning environment affects the learning outcomes. If the learning environment is helpful and useful for the child then as a result the child will learn.
I think students learn best when the environment is consistent and safe. When students trust their teacher and believe that they have their best interests in mind, outcomes are normally positive.
Our students are constantly barraged with new information and exciting, visually stimulating experiences via their personal technology. Our traditional classrooms and uncomfortable desks inhibit our students. I also think it's important to note that our students' home lives are much less structured than our generation. They do not have clearly defined eating spaces, study spaces, or living spaces. Instead, all their boundaries blur and are much more flexible than we experienced as children. I think that accommodating children to multi-use areas, comfortable seating, and visually appealing spaces that vary tasks away from traditional pencil/paper task increase student interest. As a result, I spend less time re-teaching and I'm able to truly focus on student deficits. Also, absences and off-task behavior decrease.
Hand in hand. When you open up learning spaces and seating, you are teaching the students to be independent learners.
The outcome should drive the learning environment.
The teacher and his/her philosophy have a more profound effect on learning outcomes than the environment.

Learning outcomes were also addressed in the interviews with the question, "How did

the learning environment support student learning?" One teacher responded, "Students were

able to change seating based on the need for movement at that point in time." Another

responded, "The classroom environment was a structured and more formal environment to

encourage students to prepare for their presentations with both their speech and visual props."

A third teacher stated, "Students collaborated with other students to create and produce

freely. The collaboration aspect of the space pushed the timid and insecure students out of

their comfort zone while giving them a safe and secure atmosphere to become a strong

member of their team."

For the most part, there is alignment in teacher and student perceptions of where

teachers are most comfortable teaching and students are most comfortable learning. Teachers

exhibit an awareness of their students' preferred learning environments, even if they did not

utilize the spaces regularly. Teachers do not seem to be aware, however, that their apparent

comfort in teaching in their own spaces is noticed by students, and students attribute the lack

of access to the learning spaces to their teachers' personal preferences to teach in an

environment over which they exercise control. The number of students who self-identify

further evidences they are more comfortable learning outside the classroom.

Theme 4: Student Perceptions of Comfort in the Classroom

The initial input from students regarding levels of comfort in the classroom was also

through survey and questionnaire responses. In response to the student survey prompt "I am

more comfortable learning in:" six fifth grade students responded with "the classroom," 12 fifth

grade students responded with informal and formal spaces outside the classroom, and 13 fifth

grade students responded with "all the above." Sixth grade responses on the same question

were considerably different, with 11 responding they were more comfortable in the classroom, 15 responding they were more comfortable in informal and formal spaces outside the classroom, and eight students responding with "all the above."

When given the survey prompt "I am more comfortable learning when sitting at a desk," the fifth and sixth grade responses were equally diverse, with the exception that for both grade levels the largest number of responses was "neutral." In fifth grade the responses were fairly evenly dispersed, as 11 students responded *strongly disagree* and *disagree*, 10 students responded *neutral*, and 11 students responded *strongly agree* and *agree*. In sixth grade however, five students responded with *strongly disagree* and *disagree*, 20 students responded *neutral*, and nine students responded *strongly agree* and *agree* as shown in Table 22.

Table 22

Student Perception Survey Responses to Questions 2 and 5

	5th Grade		6th Grade	
	#	%	#	%
Responses to Question 2: "I am more comfortable learning in…"				
The Classroom	6	.193	11	.323
Informal spaces outside the classroom (such as the reading lounge and courtyard)	8	.258	13	.382
Formal spaces outside the classroom (such as the science lab or computer lab)	4	.129	2	.064
All the above	13	.419	8	.235
Responses to Question 5: "I am more comfortable learning when sitting at a desk:				
Strongly Disagree	6	.1875	2	.0588
Disagree	5	.1562	3	.0882
Neutral	10	.3125	20	.5882
Agree	7	.2187	8	.2352
Strongly Agree	4	.1250	1	.0294

There were also substantial differences in the responses by grade level regarding where students believe their teachers feel more comfortable teaching. According to the student responses, three of the four fifth grade teachers prefer to teach in areas outside their classroom, as well as in their classroom. One teacher, however, was believed to prefer her own classroom, "because she is always comfortable, and knows [where] everything [is]."

Table 23

Examples of Student Perception Questionnaire Responses: Most Comfortable Teaching Space for Teacher

Responses to "In what kind of space does your teacher feel more comfortable teaching? Why do you think that?"	
5th Grade	6th Grade
- Wilson the garden - My teacher Mrs. Wilson feels more comfortable in her room because she always explains the assignment and then she starts to grade papers and helps people who need it. - Mrs. Wilson, In the classroom because of: 1. it is more easy to make shore the kids are on task 2. it is more profitably organized 3. she knows where everything, and everybody, are. - Wilson - flex lab because she wants us to learn, have fun, and be comfortable.	- Mrs. Bennet: in a classroom, because she hardly takes us out of it a lot. - the classroom because Mrs. Bennet has all the space she needs to teach was we need to know and she never really takes us out of the classroom. - Mrs. Bennet seems to like teaching in a classroom space, because she looks comfortrable - ms. Bennet a quiet place - Classroom, Mrs. Bennet seems to enjoy teaching in the classroom, we usually never leave the classroom.
Mrs. Wilson: Flex lab because I feel she wants us to learn, have fun, and be comfortable at the same time.	I think that Mrs. Bennet prefers her teaching stool, because that way she can see us all at the same time.

The sixth grade student responses indicate the sixth grade teachers show a preference for teaching in their own classrooms. Sixth grade responses to this question include, "I would have to say in a formal learning space, because in those kinds of places a teacher has more

control of what is going on;" "My teacher's classroom, because he/she knows where everything is and has the control of their own space;" "The classroom, because we never go anywhere else;" and "I'd say the classroom, because they have all of their materials needed to teach." Overwhelmingly in the responses by both grade levels, teacher comfort was attributed to where instruction took place and why. Examples of the responses for this question are in Table 23. A complete list of the responses is in Appendix P.

The availability of resources was also a notable topic of comments by students attending to comfort. As evidenced in Table 15, on the questionnaire, several references were made to the availability of items more conveniently accessible in the classroom. Eight student responses specifically mentioned resources, with statements such as, "no classroom resources," "do not have all mitereils [sic]," and "when i need it. it is not thair [sic]." Another student noted, "You don't have any stuff on the walls to make you not forget what you have learned." Also noted by a student was the fact that "there is no projector that the teacher can show us what to do on." When asked, "What would change in the learning spaces of this school?" four students stated they would like more books, fidget toys, and technology.

Comfort and Learning Outcomes

References to comfort predominated the responses on the question "What do you think is the relationship between learning spaces in school and how well you learn?" As seen in the various responses by students outlined in Table 24, one student observed,

> Most kids don't like sitting in a classroom all day, so I think every once in a while we should get to go somewhere other than our classroom for a special lesson. You can use the learning space to your advantage, by using the materials. That could have an impact on our learning, it will grab our attention and keep it.

Another student stated, "I think the relationship is that the more comfy learning spaces are to the students the more they can focus." A third student responded, "I think it's pretty good because I pay more attention when I'm comfortable in the reading lounge or in the flex lab." A complete list of the student responses is in Appendix Q.

Table 24

Examples of Student Perception Questionnaire Responses: Relationship between Learning Spaces and Outcomes

Student Responses What do you think is the relationship between learning spaces in school and how well you learn?
• we get to have fun and be comfortable instead of cramped up in classroom and we get to relax.
• Comfortable and fun classrooms make learning easier.
• If your in a bleh learning space your not awake your sleepy< but with a awsome learning space your awake and happy.
• if you are in a comforboll it helps me learn
• i think it's pretty good because I pay more attention when I'm comfortable in the reading lounge or in the flex lab.
• I think the relationship is that the more comfy learning spaces are to the students the more they can focus.
• i think in the normal chairs it not that confortable so im constantly moving
• They make us feel relax and chill while we are working
• I think the relationship is good and I learn very good when I am in a comfortable place. good cause there are different ways of learning i think we learn more because we are more focus than being in a chair everyday in the class rooms
• It makes learning easier for me, because I don't like sitting at a desk for four and a half hours.
• i think that different have different ways of learning like the seating
• Most kids don't like sitting in a classroom all day, so I think every once in awhile we should get to go somewhere other than our classroom for a special lesson. You can use the learning space to your advantage, by using the materials. That could have an impact on our learning, it will grab our attention and keep it.
• I think the relationship is, that when we are relaxed we read better. But when we have more tension, we work better when we are at a desk.
• Learning spaces are such much quieter and more roomy

The impact of the learning environment was also attended to during the student focus group with the question, "How would this lesson have been different if taught in a different learning space?" An automatic response by one of the sixth grade participants was "Oh, I'd be able to learn better. Because, the seats are different. I'd learn better because it's not the same old seats that you had to sit in like any other class." To the question "How did the learning environment support your learning?" a fifth grade student responded, "The places make learning fun, not just boring, like sitting there doing paper work. So when it's boring like that, people tend to doze off."

As with teacher perceptions of comfort in the classroom, there are areas of alignment in the data related to student and teacher perceptions about students' perceived comfort in the classroom. Both teachers and students feel access to resources has an impact on the effectiveness of learning in alternate learning spaces. However, while teacher responses indicate they feel they provide sufficient flexibility in the classroom, student responses indicate a strong desire to be allowed to learn outside the classroom more often. There appears to be some level of disconnect between the versatility in learning that teachers believe they are providing and the versatility on learning that students believe teachers are providing. This disconnect is discussed in more depth in Chapter 5.

Summary

In this chapter, the findings of the study were provided. These findings are based on the analysis of the various data sources: student and teacher perception surveys and questionnaires, classroom observations, student focus groups, and teacher interviews. These

findings were discussed as they relate to the four identified themes–student interactions, students' autonomy in personalizing their learning space, teacher perceptions of comfort in the learning environment, and student perceptions of comfort in the learning environment.

Data in the first theme focused on student interactions and the evident role of distractibility in relation to those interactions. The second theme focused on indications that student have a desire to personalize their learning environment, and have a say in how their environment is designed and outfitted. The third and fourth themes attend to the perceptions of teacher and students regarding their comfort in the learning environment and the perceived comfort of the others in their environment. These themes also speak to the roles of resources and learning outcomes as they are perceived to relate to comfort.

There was variance in the grade levels as well as variance in what teachers perceived as opposed to what students perceived. In Chapter 5, I discuss in detail these variances along with implications of these variances on teaching and learning. Recommendations for future best practices related to learning spaces and long-term research opportunities are revealed in Chapter 5.

CHAPTER 5

DISCUSSIONS, RECOMMENDATIONS, AND CONCLUSION

Perception is reality. Researchers agree that student and teacher perceptions of

learning have an impact on student development and learning. Aina (2015) observed, "A school

that has [a] very serene and inviting environment promotes teaching and learning, hence pupils

derive more satisfaction being a pupil in the school" (p. 150). A 2003 study by the Tennessee

Advisory Commission on Intergovernmental Relations noted, "physical conditions do have

direct positive and negative effects on teacher morale, a sense of personal safety, feelings of

effectiveness in the classroom, and on the general learning environment" (p. 4). The

Commission went on to suggest,

> There is a strong implication from the entire body of research that the quality of
> facilities has more of an effect on factors such as student attitudes toward school, self-
> esteem, security, comfort, and pro-social behavior, which in turn affects learning and
> achievement. (p. 8)

The purpose of this study was to ascertain student and teacher perceptions of the

environment in which student learning takes place and their perceptions of how it has helped

them in the cognitive and social domains. I also intend to examine student and teacher

perceptions of the academic impact learning environments have on students. Consideration

was given to contributing factors that related to how students learn, how teachers facilitate

learning in different settings, and the role and influence of peer interaction on learning

acquisition.

Discussion and Connection to the Literature

Three fundamental questions framed this research:

89

1. What are student perceptions of the environment in which they learn in relation to cognitive and social development?

2. What are teacher perceptions of the environment in which they teach in relation to students' cognitive and social development?

3. What is the relationship between student and teacher perceptions of the environment in which learning takes place and its perceived influence on student academic development?

These research questions were answered by themes that emerged from surveys, questionnaires, classroom observations, student focus groups, and teacher interviews. The next sections are the four themes and how they connect to prior research.

Theme 1: Student Interactions

Prominent research in the areas of student social and cognitive development shows students engaged in positive peer-to-peer interactions are more responsive to the learning experience. Booren et al. (2012) found "children consistently displayed higher levels of prosocial peer behavior in all settings except for larger groups and occasionally routines/transitions" (para. 29) were observed "displaying more self-reliant task behaviors," (para. 31) and had the ability to "positively initiate and lead peer interactions" (para. 31). Copple and Bredenkamp (2010) asserted it is developmentally appropriate to allow students to have opportunities to converse throughout the day. Schlechty (2011) suggested conversations with and by students are critical for teachers to understand "patterns of engagement in their classroom" (p. 63).

Understanding the position on student interactions in current research provides a lens through which to synthesize the observed classroom interactions and the perceived

opportunities for interactions on the part of students and teachers. In support of the research

questions related to student and teacher perceptions regarding learning environments and

peer-to-peer interactions, the data sources in this study show student interactions, and the

environment in which they take place, are perceived to have an impact on social and cognitive

development. Each data source reinforces when students are allowed to work together in a

space conducive to their learning, they are more successful in learning. The data sources also

reinforce that teachers and students both understand student interaction is beneficial to social

development.

While the research questions posed in this study inquire about the perceptions of the

students and/or teachers as they relate to the educational learning environments of their

school, it is relevant to note what is not asked is whether these perceptions are aligned. For the

most part, there is an ideological alignment in what students and teachers perceive regarding

these interactions. However, there is not alignment in what teachers say about their practices

and what students say about their teachers' practices. Most teachers and students agree that

they are providing opportunities for students to interact with one another academically, but

some students do not agree with the level of interaction teachers believe they are providing for

their students. This suggests students and teacher have a divergent understanding of what

constitutes as student interaction and what opportunities for students to engage in meaningful

interaction looks like through their personal lens.

Theme 2: Students' Autonomy in Personalizing Their Learning Space

According to Schlechty (2011), schools are designed to supplicate students and inhibit

them from making individualized decisions about how, when, where, and what they learn. He

went on to observe, "As neophytes in the world of knowledge work, students will be expected

to become increasingly independent in their quest for knowledge" therefore, "schools and

classrooms need to be platforms for learning" (p. 102). Most research on the topic of allowing

students to personalize their space asserts students need to be able to create a learning

environment that is best suited to their needs (Cannon Design et al., 2010; Nair, 2014;

Schlechty, 2011). Not all students learn in the same way or at the same rate (Campbell &

Campbell, 1999; Gardner, 1999; Gregory & Kaufeldt, 2015; Medina, 2014). Some students need

more time and space to process alone, while others thrive on social and academic interactions

with their peers.

A misalignment of perception was once again noted in the students' abilities to

personalize their learning spaces. While student and teacher responses indicate a mutual

understanding that students need to personalize their space, student responses suggest they

do not feel they are in control of their learning environment enough to initiate desired changes.

Most comments about where their teachers prefer to teach focus on the students' perceptions

of the teachers' needs rather than the student needs. Additionally, the teacher responses

weigh heavily on the side of focusing on their teaching environment needs rather than the

students' learning environment needs.

The student perception that their teachers feel a need to exert control over the

students' learning environment is further evidenced by the number of responses by sixth grade

students who note their teachers do not take them to the alternate learning spaces available in

the school. This resistance to allowing students to control their learning, and therefore by

extension their learning environment, is consistent with observations of Schlechty (2011), who

wrote,

> Adults control children and what they learn because adults control the information
> children will receive as part of their education. The teacher is the master of this
> information and the primary point of access to the information. The student is the
> supplicant and a subordinate . . . Therefore, if schools and teachers are to continue to
> have a major impact on what students learn, teachers are going to need to learn to
> direct the learning of their students rather than attempt to control it. (p. 7)

As such, students who perceive control over the environment rests in the hands of the teacher

will not attempt to personalize their space because the space belongs to the teacher.

Theme 3: Teacher Perceptions of Comfort in the Classroom

Comfort is a personal experience based on individual preferences, which means

responses about comfort rely heavily on individual and collective perceptions. The study results

elucidate features of the various learning environments teachers consistently identify with the

concept of comfort. As such, the idea of comfort resonates throughout the data sources, as

applied to a variety of contexts. Lackney (2000) wrote, "Learning takes place in many different

kinds of space. The self-contained classroom can no longer provide the variety of learning

settings necessary to successfully facilitate twenty-first century learning" (p. 13). Teachers who

are more open to using the alternate learning environments in the school, tend to be more

aware of, and provide more opportunities for their students' needs for movement, variety, and

peer interaction.

There is not a significant amount of research on teachers' perceptions of learning spaces

or the level of comfort they may or may not derive from teaching in spaces outside of the

traditional classroom. Most research about perceptions revolves around individual perceptions

in response to general features of school facilities such as cleanliness or safety (Ariani & Mirdad, 2016; Jensen, 2003; Kilgore & Reynolds, 2011). This may be in part due to the difficulty in quantifying a quality as intangible and personal as comfort. Due to the potential collateral aspect teachers' perceptions of comfort, or lack thereof, can have on their ability to meet the needs of all students, this is a considerable factor in the discussion of using learning environments to broaden student learning. While research may not effectively address teachers' perceptions of comfort it does speak to best practices for teaching and learning. Constructivist learning theory posits the teacher acts as the facilitator of learning as the learner constructs new knowledge from the learning environment (Juvova et al., 2015; Liu & Chin, 2010; Scheer et al., 2012; Kritzenberger et al., 2002; Yildirim, 2014; Yilmaz, 2008). Therefore, the role of environment supersedes the role of the teacher in the learning space, and the focus shifts from teaching practices to learning modalities.

This shift from teacher to learner apparently proves difficult for some teachers as their perceptions of comfort in the classroom focus predominantly on those factors that impact how they teach, rather than on how students learn. In reviewing the data, there is a notable shift between fifth and sixth grade teachers and their levels of comfort teaching in learning spaces outside the classroom. Although teachers on both grade levels agree the learning environment has an impact on student academic success, there are differences in what sixth and fifth grade teachers believe to be a conducive learning environment. The sixth grade teachers believe their students learn better in their classrooms, and therefore rarely take their students to spaces outside of the classroom to learn. This is reiterated by what sixth grade students report about learning outside the classroom.

Conversely, a majority of fifth grade teachers report to taking their students to learning spaces outside their classroom on a regular basis, which is likely due to the fact most of them self-proclaim to prefer teaching in the alternate learning spaces. This is reiterated by what fifth grade students report about learning outside the classroom. Although it is evident the perceptions of the students and teachers in the fifth grade and in the sixth grade are closely aligned, the perceptions of students and teachers are highly dissimilar when comparing the grade levels to one another.

It is apparent teachers who are more comfortable teaching in their classroom do not utilize the alternate learning environments, although they agree the environment impact learning. Moreover, the sixth grade teachers believe they are providing a suitable learning environment within their classroom, despite student data that reflects students do not agree.

Theme 4: Student Perceptions of Comfort in the Classroom

While teacher perceptions of comfort in the classroom applied specifically to the spaces in which they teach, student perceptions of comfort in the classroom focused more on factors that impact how they learn. There is considerably more applicable research on what students perceive to be suitable learning environments for themselves than on teacher perceptions of comfort in alternate learning environments. For the most part, student responses echo what has already been discovered about their learning environment preferences (Jensen, 2003; Nair, 2011, 2014; Cannon Design et al., 2010). Furthermore, these preferences align to research on best practices for differentiated instruction, brain-based instruction, and meeting the diverse

95

needs of students (Campbell & Campbell, 1999; Gardner, 1999; Gregory & Kaufeldt, 2015; Medina, 2014).

As with attending to the concept of comfort based on teacher perceptions, student responses about comfort also rely heavily on individual and collective perceptions. The study results elucidate features of the various learning environment students consistently identify with the concept of comfort. As such, the idea of comfort resonates throughout the data sources, as applied to a variety of contexts, as well. While there are several who prefer a quiet classroom in which to learn, several students expressed a preference for an alternative learning space, stating they learn best and are engaged most when comfortable.

There was a drastic shift between fifth and sixth grade students who self-identified as learning better in learning spaces outside the classroom and learning in the traditional classroom. A greater number of sixth grade students responded to a preference for learning in the classroom than fifth grade students, who showed a greater preference for learning in a variety of learning spaces. Similarly, a larger number of sixth grade students than fifth grade students responded they were more comfortable learning in the classroom. Conversely, however, a larger number of sixth grade students than fifth grade students responded to be more comfortable learning in informal learning spaces. Relevant to this observation on the part of the students is the students and teachers in sixth grade agree they rarely engage in learning experiences outside of the classroom. Based on these data responses, it can be argued sixth grade student responses might be skewed due to a lack of exposure. If given more opportunities to learn in a variety of learning environments, would more students have

responded they learned better and/or were more comfortable learning in learning spaces outside the classroom?

Recommendations

Students, teachers, and school administrators face a number of challenges in instructional practices. Student behavior, state and local accountability, and student safety all drive instructional decision-making and planning. New initiatives must be well thought out and planned in order for them to be implemented with fidelity and buy-in. Student and teacher input should be elicited, and teachers must be trained. Whenever planning for a major change to instruction, research should drive those changes.

The findings of this study point to four recommendations for educational leaders to ensure the effective implementation of new and dynamic learning spaces: (a) consult and support teacher and students, (b) provide professional development, (c) visit campuses and other learning spaces, and (d) add color.

Recommendation 1: Consult and Support Teachers and Students

Teachers want their voices to be heard and their opinions to be valued. Many teachers know students need more options for seating in and outside of the classroom. They also know the environment has a substantial impact on student learning and engagement. The data sources reinforced this point with several teachers referencing specific changes and aspects of their learning environment that helped their students learn better. The data sources also showed some teachers are resistant to changes that are problematic, such as using spaces that

do not have the technology and resources they feel they need to teach effectively. Providing

teachers with the support to initiate change frees them to take risks from which they might

otherwise shy away. One teacher wrote,

> It was liberating to be able to try some new things that I would not have in the past. I think teachers are less likely to try some of the new research because we know what test results we get with our methods, and we worry that if we try something new, it will backfire and scores will be bad.

Teachers should be involved in decision-making about their teaching spaces. Allowing teachers

to be a part of the decision-making process regarding changes to learning spaces enables them

to share their professional observations related to ways students learn, and speak to their

concerns about the spaces in which they will teach. Open dialogue and idea sharing provides a

catalyst to transformations that will benefit both teacher and students.

Students also want their voices to be heard and have their opinions valued. Although we

know students are our clients, we rarely consult them on things that impact their learning, like

seating and instructional materials. As evidenced by the data sources, many students have very

strong opinions about how they learn and what types of learning environments are most

effective for them. However, we most often make decisions without asking them for their

input. This practice marginalizes their opinions and tells them their views are not as useful as

those adults who control their learning.

Better yet, help eliminate the discrepancies in perceptions by bringing students and

teachers together to explore new ideas for learning environments in the school. Involve

community members in the process of designing new spaces and making decisions about

furniture and equipment.

Recommendation 2: Provide Professional Development

Simply providing innovative spaces is not enough to get teachers to use them.

Professional development is essential to ensuring teachers are prepared to move learning out

of the classroom. Just as with any new initiative, teachers need to be trained on how to use

alternate learning spaces. Managing student behaviors can be challenging in a controlled

environment. Teachers who engage their students in learning experiences in alternate learning

spaces need to train their students on expectations and procedures as they apply to the new

learning space. To most effectively do this, and to ensure consistency in expectations by all

groups that use the alternate learning spaces, administration should provide extensive site-

specific professional development on managing students, using provided resources, and

managing time and materials in the alternate learning spaces.

Another challenge to working in spaces outside the classroom is designing lessons that

capitalize on the benefits of the space. Not all lessons work equally in all spaces. Teachers need

guidance on types of lessons best suited to different learning spaces in the school, and how to

make adjustments when an instructional strategy does not work. Modeling lessons in the

different learning spaces allows teachers to use the spaces and understand the student

perspective while in those spaces. It enables them to anticipate problems and barriers before

attempting to teach in the new spaces.

Most importantly, professional development should be on-going and fluid. Professional

development experiences should be designed to allow teachers to come together and

collaborate with one another through idea sharing, discourse, and planning.

Recommendation 3: Visit Campuses and Other Learning Spaces

In most rapidly developing areas, there are one or two new schools that open every year. Just as educators are following the trends in educational research about learning practices, so are architects. When considering making changes to the learning environments of the school, look outside your walls for schools where changes have already been made. Visit newly constructed schools with state-of-the-art design features and older schools that have found and reclaimed spaces. Moreover, do not assume age-specific schools will not have design elements that can be used in your school. Schools designed for small people could have design elements that work well for teens. Post-secondary institutions may have design elements that appeal to young children.

Be open to possibilities everywhere. Schools are not the only places to find innovative design ideas. Libraries and museums have transitioned away from quiet, formidable spaces to dynamic learning institutions with Idea Labs, MakerSpaces, and more. Zoos and aquariums have evolved to become extensions of the school and learning institutions, with interactive displays, touch tanks, and keeper talks. Community centers, parks, and recreation centers are implementing play structures that are developmentally appropriate and inspire curiosity. Retail stores and restaurants emulate home design in their furniture and fixtures, encouraging patrons to linger. While there might be spaces that cannot be created within your school, you never know when, or where, you might stumble upon an idea that can be.

Recommendation 4: Add Color

While choosing paint colors can be intimidating, it is also an inexpensive and quick way

to change the feel of a space. Color can be used to designate purpose to spaces, highlight important areas, or create smaller spaces within a larger room. Research has shown that color has an impact on student learning (Cannon Design et al., 2010; Jensen, 2003; Nair, 2014). According to Cannon Design et al. (2010), "Color is the most immediate form of non-verbal communication. We naturally react to color as we have evolved with a certain understanding of it" (p. 164). Jensen (2003) stated, "Color can enhance mood, emotions, and behaviors – and possibly cognition, as well" (p.15). Nair (2014) observed "color influences student behavior, attitude, productivity, academic achievement, and attention span," and suggested using color "in ways that complement the space's intended purposes and that will create mentally and emotionally uplifting environments" (p. 42). Student responses on the questionnaire supported this research by referencing how the colors give them ideas and help them feel creative.

Recommendations for Future Research

In this study, I focused on student and teacher perceptions as they relate to learning environments. The following include other areas that need further study relative to student learning and learning spaces.

1. Studies are needed to further understand not just the perceptions, but the actual relationship between learning spaces and learning outcomes. This should consist of longitudinal data studying a space and student performance prior to and after changes have been initiated.

2. Studies are needed to further understand contributing factors that lead to teacher resistance to teaching in alternate learning environments. To overcome resistance, there needs to be a very thorough understanding of what is causing the resistance.

3. Studies are needed to further understand student preferences for personalizing their learning environments, both physical and virtual. This information would be used to determine the needs of a diverse population of students who learn through a variety of learning modalities.

4. At the campus level, data should be collected regarding teacher preferences aligned with student preferences and needs.

Conclusion

The findings of this study indicate learning environments outside the classroom have a perceived influence on students' academic and social development. There is a notable misalignment between what some teachers believe to be a suitable and engaging learning environment for students, as these beliefs do not align with what students believe to be suitable and engaging learning environment for themselves. Students have very definite and finite ideas of how and where they are comfortable learning, as well as how and when their teachers are most comfortable teaching. Unfortunately, these ideas also do not align.

In order for real change to take place, teachers need to enquire about and embrace student preferences and allow for the discomfort that will be present when trying something new. They must be willing to relinquish control of the learning experience to allow for possibilities in personalized learning on the part of the student. They must risk initial failure to allow for greater successes in the long run.

Change is hard, scary, and uncomfortable, but if teachers do not change the way they are teaching students, they are not preparing them for the challenges they will face in their

careers and personal lives. Administrators should support teachers and allow them to take risks

free of repercussions. Educators need to listen to the voices of the students and allow them to

be an active participant in designing their learning experiences.

APPENDIX A

STUDENT SURVEY

These survey questions were derived from sample questions provided by the Learning Spaces and Learning Styles web site (learningspacesandlearningstyles.com, 2016).

Student Perception Survey

The purpose of this survey is to determine your perceptions about learning environments and the influence they have on your academic and social success.

1. **I learn best in:**
   Mark only one oval.

   ◯ The classroom

   ◯ Informal spaces outside the classroom (such as the reading lounge, courtyard)

   ◯ Formal spaces outside the classroom (such as the science lab, computer lab)

   ◯ All the above

2. **I am more comfortable learning in:**
   Mark only one oval.

   ◯ The classroom

   ◯ Informal spaces outside the classroom (such as the reading lounge, courtyard)

   ◯ Formal spaces outside the classroom (such as the science lab, computer lab)

   ◯ All the above

3. **My teacher presents lessons in learning spaces outside the classroom:**
   Mark only one oval.

   ◯ Once a week

   ◯ Once a month

   ◯ Once a semester

   ◯ Rarely

4. **I get to work with other students:**
   Mark only one oval.

   ◯ Daily

   ◯ Once a week

   ◯ Once a month

   ◯ Rarely

5. **I am more comfortable learning when sitting at a desk.**

   Mark only one oval.

   - ( ) Strongly disagree
   - ( ) Disagree
   - ( ) Neutral
   - ( ) Agree
   - ( ) Strongly agree

6. **The learning environment has an impact on my academic success**

   Mark only one oval.

   - ( ) Strongly disagree
   - ( ) Disagree
   - ( ) Neutral
   - ( ) Agree
   - ( ) Strongly agree

7. **I learn better when working with other students.**

   Mark only one oval.

   - ( ) Strongly disagree
   - ( ) Disagree
   - ( ) Neutral
   - ( ) Agree
   - ( ) Strongly agree

8. **My teacher offers a variety of learning spaces.**

   Mark only one oval.

   - ( ) Yes
   - ( ) No

APPENDIX B

STUDENT QUESTIONNAIRE

These questionnaire items were derived from sample questions provided by the Learning Spaces and Learning Styles web site (learningspacesandlearningstyles.com, 2016).

Student Perception Questionnaire

The purpose of this questionnaire is to determine your perceptions about learning environments and the influence they have on your academic and social success.

1. In what kind of space does your teacher feel most comfortable teaching? Why do you think so?

    _____

    _____

    _____

    _____

    _____

2. How well do you think your teacher uses the different learning spaces in the school?

    _____

    _____

    _____

    _____

    _____

3. How well do you think furniture is used in learning spaces in this school?

    _____

    _____

    _____

    _____

    _____

4. What do you think is the relationship between the learning spaces in school and how well you learn?

    _____

    _____

    _____

    _____

    _____

5. Describe the best learning space(s) for you.

_____

_____

_____

_____

_____

6. What is the hardest part about learning outside the classroom?

_____

_____

_____

_____

_____

7. What is the best part about learning outside the classroom?

_____

_____

_____

_____

_____

8. What would you change about the learning spaces in this school?

_____

_____

_____

_____

_____

APPENDIX C

TEACHER SURVEY AND QUESTIONNAIRE

These survey and questionnaire items were derived from sample questions provided by the Learning Spaces and Learning Styles web site (learningspacesandlearningstyles.com, 2016).

Teacher Perception Survey and Questionnaire

The purpose of this survey and questionnaire is to determine teacher perceptions about learning environments and their influence on student academic and social success.

1. **My students learn best in:**
   Mark only one oval.

   ◯ The classroom

   ◯ Informal spaces outside the classroom

   ◯ Formal spaces outside the classroom

   ◯ All the above

2. **I am more comfortable teaching in:**
   Mark only one oval.

   ◯ The classroom

   ◯ Informal spaces outside the classroom

   ◯ Formal spaces outside the classroom

   ◯ All the above

3. **I use learning spaces outside the classroom:**
   Mark only one oval.

   ◯ Once a week

   ◯ Once a month

   ◯ Once a semester

   ◯ Rarely

4. **My students work with other students:**
   Mark only one oval.

   ◯ Daily

   ◯ Once a week

   ◯ Once a month

   ◯ Rarely

5. **My students are more successful at learning when sitting at desks.**
   Mark only one oval.

   ( ) Strongly disagree

   ( ) Disagree

   ( ) Neutral

   ( ) Agree

   ( ) Strongly agree

6. **The learning environment has an impact on student achievement.**
   Mark only one oval.

   ( ) Strongly disagree

   ( ) Disagree

   ( ) Neutral

   ( ) Agree

   ( ) Strongly agree

7. **My students learn better when working with other students.**
   Mark only one oval.

   ( ) Strongly disagree

   ( ) Disagree

   ( ) Neutral

   ( ) Agree

   ( ) Strongly agree

8. **My school offers a variety of learning spaces.**
   Mark only one oval.

   ( ) Yes

   ( ) No

9. **Describe the best teaching environment for you.**

   _____

   _____

   _____

   _____

   _____

10. How do you know what is the best learning environment for students?

_____

_____

_____

_____

_____

11. How does a teacher's teaching style influence the use of learning spaces? How would you change them?

_____

_____

_____

_____

_____

12. What do you think is the relationship between learning environment and learning outcomes?

_____

_____

_____

_____

_____

13. Describe the best learning spaces for your students.

_____

_____

_____

_____

_____

14. What are the greatest challenges about teaching outside the classroom?

_____

_____

_____

_____

_____

15. **What are the greatest rewards about teaching outside the classroom?**

_____

_____

_____

_____

_____

16. **What would you change about the learning spaces in this school? How would you change them?**

_____

_____

_____

_____

_____

APPENDIX D

LEARNING ENVIRONMENT OBSERVATION PROTOCOL

The selection of these focus design elements was derived from Nair's (2014), Design Elements that Define Educational Effectiveness.

Design Elements	Design Sub-elements	Descriptors
Interior Design	Furnishing	Comfortable, ergonomic options available Varied based on individual student needs Safe and appropriate
	Colors	Complements the intended use of the space
	Materials and Textures	Varied based on space needs Provide for variety of activities: whiteboards, tack boards, etc. Floor surfaces support movement and comfort
	Clutter	Free of clutter and safe
	Ethos and Aesthetics	A sense of community
Spatial Organization	Scale	Accessibility of built or added features by student Size of space relative to occupants Space provides for social groupings
	Variety and Flexibility	Space provides for multiplicity of learning activities
	Informal Learning Areas	Provides for social or informal interactions to occur

APPENDIX E

PEER AND TEACHER INTERACTION OBSERVATION PROTOCOL

Student and Teacher Interaction Observation protocol was derived from the Social Interaction Observation Form provided by the Lakes Country Service Cooperative (2016), and aspects of domain two of the Individual Classroom Assessment Scoring System (inCLASS) observation protocol (Downer et al., 2010).

Opportunities for Peer Communication	Often	Occasionally	Rarely	Never
Opportunities for Peer Assertiveness	Often	Occasionally	Rarely	Never
Opportunities for Classroom Group Activities	Often	Occasionally	Rarely	Never
Opportunities for Peers Questions	Often	Occasionally	Rarely	Never
Opportunities to Engage in Social Conversation	Often	Occasionally	Rarely	Never
Appropriate Peer Interactions	Observation Notes and Frequency Table			
Number of Students Who Appear to have Preferred Peers	Frequency Table			
Number of Positive Student to Teacher Interactions	Frequency Table			
Nature of Student to Teacher Interactions	Observation Notes			

APPENDIX F

TEACHER INTERVIEW QUESTIONS

The purpose of this study is to ascertain student and teacher perceptions of the environment in which student learning takes place and their perceptions of how it has helped them in the cognitive and social domains. I will begin each interview by informing the interviewee about the study. In addition, a written explanation will be provided regarding the recording of the interview and that responses will be strictly confidential. The participants will also be informed that if there is something to say off the record, then I will oblige by stopping the recording midstream for commentary.

These interview question items were derived from sample questions provided by the Learning Spaces and Learning Styles web site (learningspacesandlearningstyles.com, 2016).

1. How did you think the class went?

   a. What did you think worked well in this class?

   b. How can you use what worked well in your next class?

1. Was this a typical class?

   a. If different, what made this class different from others you have taught?

2. How did the learning environment support student learning?

   a. How would this lesson have been different if taught in a different learning space?

3. Were students allowed to work together during this lesson?

   a. Did working with one or more other students help or hinder the student's success on the lesson? *Or,*

   b. Would working with one or more other students have helped or hindered the student's success on the lesson?

4. How much of the lesson was teacher-centered (lecturing, demonstrating) versus student-centered (students working and thinking)?

   a. Who was doing most of the work in this lesson – you or the students?

5. How would your students evaluate the overall usefulness or value of this lesson?

6. If you could make one change to the learning environment, what would it be? Why?

I will end the interview by thanking the interviewee and explain the next steps in the research process. I will again assure the interviewee that his or her identity will not be revealed in connection with the answers given in the interview.

Cross-references of interview questions with the overarching research question are described as follow:

1. What are student perceptions of the environment in which they learn in relation to cognitive and social development?

   Interview Questions that Align: Question 6

2. What are teacher perceptions of the environment in which they teach in relation to students' cognitive and social development?

   Interview Questions that Align: Questions 3-7

3. What is the relationship between student and teacher perceptions of the environment in which learning takes place and its perceived influence on student academic development?

   Interview Questions that Align: Questions 3-7

APPENDIX G

STUDENT INTERVIEW QUESTIONS

The purpose of this study is to ascertain student and teacher perceptions of the environment in which student learning takes place and their perceptions of how it has helped them in the cognitive and social domains. I will begin each interview by informing the interviewee about the study. In addition, a written explanation will be provided regarding the recording of the interview and that responses will be strictly confidential. The participants will also be informed that if there is something to say off the record, then I will oblige by stopping the recording midstream for commentary.

These interview question items were derived from sample questions provided by the Learning Spaces and Learning Styles web site (learningspacesandlearningstyles.com, 2016).

1. How did you think the class went?

    a. What did you think worked well in this class?

2. Was this a typical class?

    a. If different, what made this class different?

3. How did the learning environment support your learning?

    a. How would this lesson have been different if taught in a different learning space?

4. Were you allowed to work with other students during this lesson?

    a. Did working with one or more other students help or hinder your success on the lesson? *Or,*

    b. Would working with one or more other students have helped or hindered the student's success on the lesson?

5. How much of the lesson was teacher-centered (lecturing, demonstrating) versus student-centered (students working and thinking)?

    a. Who was doing most of the work in this lesson – you or the students?

6. Did you think the lesson, or what you learned, was useful?

7. If you could make one change to the learning environment, what would it be? Why?

I will end the interview by thanking the interviewee and explain the next steps in the research process. I will again assure the interviewee that his or her identity will not be revealed in connection with the answers given in the interview.

Cross-references of interview questions with the overarching research question are described as follow:

1. What are student perceptions of the environment in which they learn in relation to cognitive and social development?

   Interview Questions that Align: Question 3-7

2. What are teacher perceptions of the environment in which they teach in relation to students' cognitive and social development?

   Interview Questions that Align: Questions 6

3. What is the relationship between student and teacher perceptions of the environment in which learning takes place and its perceived influence on student academic development?

   Interview Questions that Align: Questions 3-7

APPENDIX H

TEACHER AND STUDENT SURVEY QUESTION ALIGNMENT

Teacher Perception Survey Questions	Student Perception Survey Questions
My students learn best in: The classroom Informal spaces outside the classroom Formal spaces outside the classroom All the above	I learn best in: The classroom Informal spaces outside the classroom Formal spaces outside the classroom All the above
I am more comfortable teaching in: The classroom Informal spaces outside the classroom Formal spaces outside the classroom All the above	I am more comfortable learning in: The classroom Informal spaces outside the classroom Formal spaces outside the classroom All the above
I use learning spaces outside the classroom: Once a week Once a month Once a semester Rarely	My teacher presents lessons in learning spaces outside the classroom: Once a week Once a month Once a semester Rarely
My students work with other students: Daily Once a week Once a month Rarely	I get to work with other students: Daily Once a week Once a month Rarely
My students are more successful at learning when sitting at desks. Strongly Disagree Disagree Neutral Agree Strongly Agree	I am more comfortable learning when sitting at a desk. Strongly Disagree Disagree Neutral Agree Strongly Agree
The learning environment has an impact on student achievement. Strongly Disagree Disagree Neutral Agree Strongly Agree	The learning environment has an impact on my achievement (academic success). Strongly Disagree Disagree Neutral Agree Strongly Agree
My students learn better when working with other students. Strongly Disagree Disagree Neutral Agree Strongly Agree	I learn better when working with other students. Strongly Disagree Disagree Neutral Agree Strongly Agree

My school offers a variety of learning spaces.	My teacher uses a variety of learning spaces when teaching.
Strongly Disagree	Strongly Disagree
Disagree	Disagree
Neutral	Neutral
Agree	Agree
Strongly Agree	Strongly Agree

APPENDIX I

TEACHER AND STUDENT PERCEPTION QUESTIONNAIRES ALIGNMENT

Teacher Perception Questionnaire Questions	Student Perception Questionnaire Questions
Describe the best teaching environment for you…	In what kind of space does your teacher feel most comfortable teaching? Why do you think so?
How do you know what is the best learning environment for students?	How well do you think your teacher uses the different learning spaces in the school?
How does a teacher's teaching style influence the use of learning spaces?	How well do you think furniture is used in learning spaces in this school?
What do you think is the relationship between learning environment and learning outcomes?	What do you think is the relationship between the learning spaces in school and how well you learn?
Describe the best learning spaces for your students.	Describe the best learning space(s) for you.
What are the greatest challenges about teaching outside the classroom?	What is the hardest part about learning outside the classroom?
What are the greatest rewards about teaching outside the classroom?	What is the best part about learning outside the classroom?
What would you change about the learning spaces in this school? How would you change them?	What would you change about the learning spaces in this school?

APPENDIX J

UNIVERSITY OF NORTH TEXAS INSTITUTIONAL REVIEW BOARD APPROVAL

UNT

UNIVERSITY OF NORTH TEXAS

A green light to greatness.

THE OFFICE OF RESEARCH INTEGRITY AND COMPLIANCE

April 19, 2017

Dr. Miriam Ezzani
Student Investigator: Chelsea Allison
Department of Teacher Education & Administration
University of North Texas

Re: Human Subjects Application No. 17-182

Dear Dr. Ezzani:

As permitted by federal law and regulations governing the use of human subjects in research projects (45 CFR 46), the UNT Institutional Review Board has reviewed your proposed project titled "Teaching outside the Box: Student and Teacher Perceptions of Flexible Learning Environments outside the 21st Century Classroom." The risks inherent in this research are minimal, and the potential benefits to the subject outweigh those risks. The submitted protocol is hereby approved for the use of human subjects in this study. **Federal Policy 45 CFR 46.109(e) stipulates that IRB approval is for one year only, April 19, 2017 to April 18, 2018.**

Enclosed are the consent documents with stamped IRB approval. Please copy and **use this form only** for your study subjects.

It is your responsibility according to U.S. Department of Health and Human Services regulations to submit annual and terminal progress reports to the IRB for this project. The IRB must also review this project prior to any modifications. **If continuing review is not granted before April 18, 2018, IRB approval of this research expires on that date.**

Please contact The Office of Research Integrity and Compliance at 940-565-4643, if you wish to make changes or need additional information.

Sincerely,

Chad Trulson, Ph.D.
Professor
Chair, Institutional Review Board

CT:jm

1155 Union Circle, #310979   Denton, Texas 76203-5017   TEL: 940.369.4643   FAX: 940.565.4277
TTY: 940.369.8652   http://research.unt.edu

APPENDIX K

INFORMED CONSENT DOCUMENTS

Informed Consent Document - Adult

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study and how it will be conducted.

Title of Study: Teaching Outside the Box: Teacher and Student Perceptions of Flexible Learning Environments outside the 21st Century Classroom.

Student Investigator: Chelsea Allison, University of North Texas (UNT) Department of Educational Leadership.

Supervising Investigator: Dr. Miriam Ezzani

Purpose of the Study: to ascertain student and teacher perceptions of the environment in which student learning takes place and their perceptions of how it has helped them in the cognitive and social domains.

Study Procedures: You will be asked to participate in a survey and questionnaire, an observation and an interview about your perceptions related to learning environments in the school, and how they influence student learning and social development. The survey and questionnaire will take approximately 30 minutes. The observation will be approximately 60 minutes. The interview will take approximately 60 minutes. Participants may withdraw at any time from the study.

Foreseeable Risks: No foreseeable risks are involved in this study.

Benefits to the Subjects or Others: This study is not expected to be of any direct benefit to you; but we hope to learn more about the influence of learning environments on the academic and social development of students; and about how best to provide learning spaces that reflect the needs of 21st century students, and prepares these students for the college and career opportunities of tomorrow.

Compensation for Participants: You will not receive compensation for your participation.

Procedures for Maintaining Confidentiality of Research Records: The confidentiality of your individual information will be maintained in any publications or presentations regarding this study. Names of participants and school will not be used; pseudonyms will be assigned to protect identities. All records and information will be kept on a remote storage device and locked in the office of the Supervising Investigator. As per federal regulations, the research participants' information will be maintained for three years and then will be deleted.

Questions about the Study: If you have any questions about the study, you may contact Chelsea Allison at callison@my.unt.edu or Dr. Miriam Ezzani at miriam.ezzani@unt.edu.

Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-4643 with any questions regarding the rights of research subjects.

Research Participants' Rights:

Your participation in the survey confirms that you have read all of the above and that you agree to all of the following:

* Chelsea Allison has explained the study to you and you have had an opportunity to contact her with any questions about the study. You have been informed of the possible benefits and the potential risks of the study.

* You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your participation at any time.

* You understand why the study is being conducted and how it will be performed.

* You understand your rights as a research participant and you voluntarily consent to participate in this study.

* You understand you may print a copy of this form for your records.

_____   _____

Signature of Participant   Date

For the Student Investigator or Designee:

I certify that I have reviewed the contents of this form with the subject signing above. I have explained the possible benefits and the potential risks and/or discomforts of the study. It is my opinion that the participant understood the explanation.

_____   _____

Signature of Student Investigator   Date

Informed Consent Document - Student

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study and how it will be conducted.

Title of Study: Teaching Outside the Box: Teacher and Student Perceptions of Flexible Learning Environments outside the 21st Century Classroom.

Student Investigator: Chelsea Allison, University of North Texas (UNT) Department of Educational Leadership.

Supervising Investigator: Dr. Miriam Ezzani

Purpose of the Study: to ascertain student and teacher perceptions of the environment in which student learning takes place and their perceptions of how it has helped them in the cognitive and social domains

Study Procedures: You will be asked to participate in surveys and a questionnaire, a classroom observation and possibly a student focus group about your perceptions related to learning environments in the school, and how they influence student learning and social development. The survey and questionnaire will take approximately 30 minutes. The observation will be approximately 60 minutes. The focus group will take approximately 60 minutes. Participants may withdraw at any time from the study.

Foreseeable Risks: No foreseeable risks are involved in this study.

Benefits to the Subjects or Others: This study is not expected to be of any direct benefit to you; but we hope to learn more about the influence of learning environments on the academic and social development of students; and about how best to provide learning spaces that reflect the needs of 21st century students, and prepares these students for the college and career opportunities of tomorrow.

Compensation for Participants: You will not receive compensation for your participation.

Procedures for Maintaining Confidentiality of Research Records: The confidentiality of your individual information will be maintained in any publications or presentations regarding this study. Names of participants and school will not be used; pseudonyms will be assigned to protect identities. All records and information will be kept on a remote storage device and locked in the office of the Supervising Investigator. As per federal regulations, the research participants' information will be maintained for three years and then will be deleted.

Questions about the Study: If you have any questions about the study, you may contact Chelsea Allison at callison@my.unt.edu or Dr. Miriam Ezzani at Miriam.ezzani@unt.edu.

Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-4643 with any questions regarding the rights of research subjects.

Research Participants' Rights:

Your participation in the survey confirms that you have read all of the above and that you agree to all of the following:

* Chelsea Allison has explained the study to you and you have had an opportunity to contact her with any questions about the study. You have been informed of the possible benefits and the potential risks of the study.

* You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your participation at any time.

* You understand why the study is being conducted and how it will be performed.

* You understand your rights as a research participant and you voluntarily consent to participate in this study.

* You understand you may print a copy of this form for your records.

_____   _____
Signature of Participant/Parent   Date

For the Student Investigator or Designee:

I certify that I have reviewed the contents of this form with the subject signing above. I have explained the possible benefits and the potential risks and/or discomforts of the study. It is my opinion that the participant understood the explanation.

_____   _____
Signature of Student Investigator   Date

APPENDIX L

STUDENT AND TEACHER PERCEPTION QUESTIONNAIRE RESPONSES

What do you think is the relationship between learning spaces in school and how well you learn?	What do you think is the relationship between learning environment and learning outcomes?
- I think the relationship is, that when we are relaxed we read better. But when we have more tension, we work better when we are at a desk. - you can probably learn about different things of how they are used or learn more about why they put the learning space there. - The differences are what type of learning it is and I learn pretty well - It helps you learn better - they can help us learn even more - They both help us learn, in different ways - i think we learn more because we are more focus than being in a chair everyday in the class rooms - They help you with your creative side being nice and colorful may give some of us ideas. - they're used to help kids think, and focus on different assignments. - i think that different have different ways of learning like the seating - I think the learning spaces are helpful for kids to understand better - that the better the learning space the easier it is to learn - It makes learning easier for me, because I don't like sitting at a desk for four and a half hours. - it is better to learn in a learning space - I honestly do better when being able to have something to fidget with - it depends on how quiet it is - The learning spaces sometimes distracts us. - strong but the people who have ADHD can have a no distraction area	- The learning environment affects the learning outcomes. If the learning environment is helpful and useful for the child then as a result the child will learn. - Learning environment to me is a place that students feel safe, can engage and participate in the learning process, are free to investigate and question, find relevance in the objectives, and develop a desire to be lifelong learners. It is not so much about a "space" as an environment. I relate it to "church is not about a building, it's about the people inside the building and what is taking place in the hearts and minds of those participating." - I think students learn best when the environment is consistent and safe. When students trust their teacher and believe that they have their best interests in mind, outcomes are normally positive.

What do you think is the relationship between learning spaces in school and how well you learn?	What do you think is the relationship between learning environment and learning outcomes?
• i think i learn more in the reading lounge but in the fun place is to loud and i get off task • The seating arrangement might distract a lot of people	
• some spaces help me learn better but others don't because I get to destracted to learn anything like in the reading lounge. • They don't bother as long as the volume is at a minimum. • bad because the drastrack me	
• A great relationship, the environment of this school provides good learning opportunities • they have a good relationship • it is good to have a different environment • it is pretty good i love learning science and reading • i think is is good • good • It's good pretty good it will help me in the future. • Good • pretty good • good, because when i learn outside the classroom i feel like i don't need to sit in those really hard chairs in the classrooms. • I think its a good one	• Hand in hand. When you open up learning spaces and seating, you are teaching the students to be independent learners.
• it learn helps us learn in a fun why • I think the relationships are for us just to have fun and we learn better if our mind is open and having fun. • I think kids learn more because they get to learn in a fun way. • I think we learn better in the learning spaces because people can have fun while learning new things.	• Our students are constantly barraged with new information and exciting, visually stimulating experience via their personal technology. Our traditional classrooms and uncomfortable desk inhibit our students. I also think it's important to note that our students' home lives are much less structured than our generation. They do not have clearly defined eating spaces, study spaces, or living spaces. Instead, all their boundaries

What do you think is the relationship between learning spaces in school and how well you learn?	What do you think is the relationship between learning environment and learning outcomes?
• depending on where we are we turn boring things to fun things and sometimes fun things to boring thing • we get to have fun and be comfortable instead of cramped up in classroom and we get to relax. • It makes learning fun • its fun get to work in partners and its quiet . • Comfortable and fun classrooms make learning easier. • If your in a bleh learning space your not awake your sleepy< but with an awesome learning space your awake and happy.	blur and are much more flexible than we experienced as children. I think that accommodating children to multi-use areas, comfortable seating, and visually appealing spaces that vary tasks away from traditional pencil/paper task increase student interest. As a result, I spend less time re-teaching and I'm able to truly focus on student deficits. Also, absences and off-task behavior decrease.
• I don't think it really matters as much to me. Just as long as it is somewhere quiet. • For me I can learn just about anywhere, but I guess the teachers could make it a little more fun. • Learning in different environments doesn't effect me that much, but the projects in the science lab do • I don't see much of a difference at all, I really just want to sit somewhere that is comfortable. • I think it does not really matter where you learn	• The outcome should drive the learning environment. • The teacher and his/her philosophy has a more profound effect on learning outcomes than the environment.
• The relationship is we learn ether way. • Same thing because, they both teach us stuff. • They both have all sorts of ways of teaching	
• if you are in a comforboll it helps me learn • i think it's pretty good because i pay more attention when i'm comfortable in the reading lounge or in the flex lab.	

What do you think is the relationship between learning spaces in school and how well you learn?	What do you think is the relationship between learning environment and learning outcomes?
- I think the relationship is that the more comfy learning spaces are to the students the more they can focus. - i think in the normal chairs it not that confortable so im constantly moving - They make us feel relax and chill while we are working - I think the relationship is good. And I learn very good when I am in a comfortable place. good cause there are different ways of learning	
- They give us a space to learn and interact at the same time. - the relationship is kids want somewhere where their free to say things they are allowed to say.	
- well, some people like to move some like to stay still so it matters to the different learning spots - Most kids don't like sitting in a classroom all day, so I think every once in a while we should get to go somewhere other than our classroom for a special lesson. You can use the learning space to your advantage, by using the materials. That could have an impact on our learning, it will grab our attention and keep it.	
- I think sometimes we need to go somewhere else to improve our grades instead of always being in the classroom - i think that the learning spaces just helps us learning in different places but how we learn it i just showing different ways to learn things	
- i don't know. - i don't know - I don`t really know	
- I think I learn better in a more closed and educational learning place. - I think I learn pretty well in the classroom	

What do you think is the relationship between learning spaces in school and how well you learn?	What do you think is the relationship between learning environment and learning outcomes?
• like an regular class	
• The surroundings on where someone works, can affect the work sometimes. • It will help people feel like they're not trapped in a classroom.	
• I like them but we do not use them. • Like I said before, I really don't use them that much, but when I do, I tend to learn better in the classroom.	
• fine • average	
• they are good materials	
• All the learning spaces are amazing there is never something wrong with it just the space i would want to get better.	
• Learning spaces are much quieter and more roomy.	
• well i learn well cause i get good grades	
• it is great it makes me feel i can do my work without concentrating too hard	

Note: Student and teacher responses are grouped by like responses respectively.

APPENDIX M

STUDENT AND TEACHER PERCEPTION QUESTIONNAIRE RESPONSES: STUDENT: WHAT IS THE

HARDEST PART OF LEARNING OUTSIDE THE CLASSROOM? TEACHER:WHAT ARE THE GREATEST

CHALLENGES ABOUT TEACHING OUTSIDE THE CLASSROOM?

What is the hardest part of learning outside the classroom?	What are the greatest challenges about teaching outside the classroom?
• not being able to concentrate some times • easy to lose focus • that you are going to get distracted • you get distracted • Everyone running around and not paying attention. • the noise in the hallway • to focus • There are a lot of distractions. • I think the hardest part of learning outside the classroom is all the DISTRACTION! • Learning outside of the classroom can be hard, because you can lose focus easily Focusing, a lot of kids are distracted by the fact we are outside the classroom • Too many distractions • I can get distracted more. • sometimes can be distracting • Distractions. • trying to pay attention. • Paying attention because people are walking by and it is not always quiet. • Focusing • I get distracted and never finish work on time. • staying focused. • sometime the other students might talk and I can get distracted • staying on task. im not talking about completely off task but things like focusing on something other than what the teacher told you to The little kids	• Distractions, noise level of my students as they are learning, and interruptions have been the biggest challenges. • It was also very distracting when classes or individuals walked by. I thought we could learn to ignore it, but without success. • Distractions would almost certainly increase
• I think it is because kids get very excited so they will tend to talk a lot so that stops me from thinking. • There are some kids that sometimes don't follow directions and then they can be loud or makes go back and don't do the activity.	• behavior management. • Managing behavior and expectations outside of the classroom. • Alternative learning spaces require a great deal of teaching concerning expectations. "Playing" is a very difficult

What is the hardest part of learning outside the classroom?	What are the greatest challenges about teaching outside the classroom?
• Some students get way to excited about like the spinning chairs in the flex lab or the rocking chairs in the reading lounge. • well when we go to the flex lab the kids play around with the chairs and sometimes yell. that people like to have fun when it is time to learn. • Only when the boys are sometimes playing too much and when they will not get quite • sometimes kids get exited and completely tune out their teachers • Friends want to sit by me. • Playing around with my friends • not talking	problem when dealing with shelter children that are very needy and a population that does not have parent support. It's also difficult to utilize the Reading Lounge without disturbing kindergarten.
• well as the kids pass you can hear a lot of stuff that is going on and we dont get focus unlike the class rooms you can close the door and it would be quiet • It is sometimes really loud if you are with other people • in noisy rooms. • other people around me distracting me and being loud • having to deal with a with other children talking to me • sometimes it can get loud • there is a lot of noise	• noise level might be prohibitive to learning
• We always work in groups when we work outside the classroom and sometimes you want every thing to be your way. • creating things with partners new stuff • When you have to do work and get confused o what your supposed to do. • Well I would say, probably there is nothing to base your work off of. • it depends on what it is • Not having a teacher to correct accedental mistakes, so you have the chance of getting it right or wrong with no help.	• Availability, logistics, time • lack of space (Ex: Our reading hallway does not provide enough space for 23 twelve year olds.), • lack of tornado/lock-down plans, • The ability to see what each and every student is doing could potentially be lost.

What is the hardest part of learning outside the classroom?	What are the greatest challenges about teaching outside the classroom?
• It kind of makes it a little bit harder to learn • The strategies, sometimes are hard. • trying to build items • Studying for test and other things. • to do things like scoot or a quiz game • can't take notes • that i don't get it • I don"t feel right • having to pick a new seat. • Because its hard to get comfortable in some areas	
• when i need it. it is not thair • You don't have any stuff on the walls to make you not forget what you have learned. • well when you get used to the classroom and then you leave it's a little weird because you're not used but it helps to be in a different environment sometimes to get your brain awake again. • do not have all mitereils	• access to materials • Not having all supplies that you might need • I've also tried keeping nurse's passes, extra supplies (dry erase markers, kleenex, etc), but they always disappear. (Now we utilize a carry case for extra supplies.) • lack of resources (tissue, paper, pencils, nurse passes, lack of telephone when students are called for early dismissal),
• there is no projector that the teacher can show us what to do on. • no classroom resources • say one thing that makes it hard is not having the surroundings we're used to in our classrooms not everything is the same • I wouldn't know how to answer this because we don't really learn outside of the classroom often. But I guess in would	
• none • none • None. • I don't think it's hard • For me there is no hardest part I enjoy it lots. • nothing	

What is the hardest part of learning outside the classroom?	What are the greatest challenges about teaching outside the classroom?
• Nothing really	
• nothing	
• I think there is nothing hard about learning outside the classroom.	
• nothing	
• everything is not hard for me i think it is easy	
• it not tought the way you teasher teash it	
• There isn't one.	

Note: Student and teacher responses are grouped by like responses respectively.

APPENDIX N

STUDENT AND TEACHER PERCEPTION QUESTIONNAIRE RESPONSES: STUDENTS: WHAT WOULD

YOU CHANGE IN THE LEARNING SPACES OF THIS SCHOOL?; TEACHERS: WHAT WOULD YOU

CHANGE ABOUT THE LEARNING SPACES OF THIS SCHOOL? HOW WOULD YOU CHANGE THEM?

What would you change in the learning spaces of this school?	What would you change about the learning spaces in this school? How would you change them?
• I would change the amount of furniture so people wouldn't fight over it and be so load and distracting because learning spaces are where you learn and have fun at the same time not fight over furniture • If we had better furniture and more time over there • More furniture. • Using different furniture, or more advanced technology • have couches • the chairs and fix the wobblely desks • add more seating chairs out side of our classrooms • i would change the chairs • have more sitting options • i would put cousins on on the hard metal chairs in the classroom and have different seating areas for kids to sit in • the seats and desk • taking away the chairs • Maybe add a couple of quotes maybe or something that kids might think is cool maybe bean bags in the flex lab so everyone won't be fighting for the spinning chair. • in the flex lab there are to many chairs • the desk, the chairs, and the rules • I'd make them a bit more comfterble. • I say more comfortable seating in the learning enviroments. • I would add more comfortable seats, that's all. • I would change the learning spaces by the desk arrangement every so often,	• Better/more seating for outside learning • Give teachers funds to create learning spaces in their classrooms. (flexible seating/desks, areas of the room for discovery and investigation)
• We would have more space to learn. • I would want to have more space because in our class there is a lot of kids, so more space would be awesome • Add more space in the lounge.	• Sixth graders are big and take up a lot of space. It is difficult to use some of the spaces just because of that.

149

What would you change in the learning spaces of this school?	What would you change about the learning spaces in this school? How would you change them?
• if things were less crouded. • Not having the whole classroom in a learning space. • the amount of how many people go there at a time • make more room for people and not put everone toghter	
• For it to be little bit quieter. • quiter vioce level • Not always quiet. • That you could listen to music while testing so you can understand better	• where noise is not an issue
• I would let all or the grades have a day to go their. • I would change our accessibility, we don't get to really learn in the learning spaces very often... • Make them more reliable and often used • and I'd also like to visit them more. • If we had to go to a different learning space with a group once or twice a week. • I would add more time outside of the classroom. • We could have more of them, because kids love the learning spaces. • that we could be more active and not be stuck in the class room every single day • I would let students move around during class.	• Our spaces also need a supply area for commonly used office supplies and clipboards (the clear plastic ones so kids can see instructions through the board and aren't constantly flipping them over). Clipboards are a must since once the kids get going, there aren't always suitable writing surfaces.
• Nothing because everything in the fun spaces are perfect already. • nothing. • Nothing I like how they are • i would not change enything • Nothing, really. It helps students learn already. • nothing	• I would not change them • I would not change the learning spaces of this school as much as I would change the availability of materials to support the curriculum.

What would you change in the learning spaces of this school?	What would you change about the learning spaces in this school? How would you change them?
• nothing • nothing • nothing • nothing • nonthing cause i like everthing • nothing • nothing because i think they are very good places to be learning.	
• there would be more outdoor activities. • if we can go outside in the courtyard and learn about the chickens • you need more activities in the court yard to keep us going during the day but besides that it's great! • The science Lab. • the science lab because you can make it a different learning place	• Yes, it would be great to actually have my classroom in the Science Lab if I'm teaching Science and not have to go back and forth from classroom to lab. But when I'm teaching Social Studies the classroom is not going to matter. The environment will...how I engage, challenge, and "launch" my students into the love of learning. I can do that in a classroom or outside of the classroom, sitting on the floor or sitting at a desk, reading a book or "playing" with manipulatives. • The teacher is the most important catalyst for inspiring life long learners; they create the learning environment.
	• More learning spaces geared towards math and science such as a STEM lab, a robotics lab, large areas, that can be accessed so the students can spread out and work in groups uninterrupted. Technology spaces, such as a green room, access to video equipment, Swivl's for students to record themselves and their project development or to record the teacher so absent students can view from home.
• in the reading lounge there are only books for younger kids I want there to be more books in the reading lounge for the older kids, and for there to be captions for the animals and	• I'd like the Reading Lounge furniture to be incorporated into its own classroom. I'd like that room to be filled with Tinker Toys, Connex, etc. Our kids play with so many electronics, they are lacking in the

What would you change in the learning spaces of this school?	What would you change about the learning spaces in this school? How would you change them?
plants in the courtyard so kids can learn more about them.	hands-on learning. Toys offer an excellent opportunity to inspire learning that is meaningful and authentic.
• fidget toys	
• I would let students use more technology.	
• What would change is that they make learning fun.	
• I would make them more fun	
• Make them more entertaining	

Note: Student and teacher responses are grouped by like responses respectively.

APPENDIX O

STUDENT AND TEACHER PERCEPTION QUESTIONNAIRE RESPONSES: STUDENTS: DESCRIBE THE

BEST LEARNING SPACE FOR YOU; TEACHERS: DESCRIBE THE BEST LEARNING SPACES FOR YOUR

STUDENTS

Describe the best learning space for you.	Describe the best learning spaces for your students.
• the flex lab • The flex lab. • the flex lab, because I can easily learn in a easy way but still have fun doing it. • the flex lab because in there i get to relax which makes me calm and i get more work done when im calm • the flex lab • the Flex Lab because it has the cave and i have one at my house and i read there with no trubble. • the flex lab because their is really cool stuff in their and it is very calm in their • The best one for me is the flex lab because it has chairs that i can work on and it's really colorful which i like colors so it's perfect for me. • The FLEX LAB but it needs peace and quiet. • Flex lab. it is fun, cool, and active. • flex lab • Flex lab • flex lab is the best lab that i think i will learn better • The flex lab because when mrs sprinkles took me there it was so quiet that I was able to my work done • I think it would be the flex lab because of the comfortable chairs and i get to sit with my friends. • flex room • the new makers center by the orchestra.	• Spaces where they can explore, question, investigate, and be active participants in the learning process...an environment, NOT A SPACE !!!!!
• Classrooms so that when i'm learning i don't get distracted. • the classroom is the best place because it is quiet and peaceful • Mrs. Smith's room. • in my homeroom class at my specail desk • her classroom because its quiet in her class	• My classroom • I believe that from day to day, the best place for students to learn math is in a controlled environment. However, if the learning space included opportunities to use everyday math to build or create it could also be helpful to cause math to come alive to the student.

Describe the best learning space for you.	Describe the best learning spaces for your students.
• in the class room. • In a classroom or Someplace that isn't loud. • The best learning space for me is in Mr. Lee's class • I think the best learning space for me is in Mrs. Bennet's room. Our desks are either sitting desks, standing desks, regular desks, or regular desks with bungee cords. I tend to learn better at a sitting desk. • The classroom. • Classroom, or Formal Places. • In the classroom or outside • classroom • Classroom and science lab • I think learning in a classroom works best, or being on devices.	
• Reading lounge because it gives me a quiet place to read and work outside the classroom where i can concentrait • The best learning space for me is the reading lounge. because the rocking chairs are very comfy and i feel at home there • the reading longe because you can look at the natue and not really here anything and you get to read in confortable chairs • The reading lounge because it can be 2 - 5 students and more quieter with lots of books. The reading lounge and the flex lab.	• Open area with different formats for instruction such as dry erase boards or Promethean boards and relaxed seating options such as standing, laying down or sitting on the floor. The more comfortable a student is, the more receptive they are to learn.
• reading hall because its quiet • reading lounge • in the lounge or Mrs. H's room. • the reading center	
• I think the best learning space for me is the court yard. • The courtyard is the learning space prefect for me because it's beatiful.	• The learning spaces outside of my classroom that seem to be the most effective this year have been: the science lab, outdoors, the hallway in front of the classroom. I believe that flexible grouping

Describe the best learning space for you.	Describe the best learning spaces for your students.
• the courtyard because it is an outdoor environment and i love to explore the outdoors • one of my favorite places is the court yard because it gives me an opportunity to stretch my legs so when I get back to the classroom I'm ready to learn again. • I think it would be fun to try to learn something in the yard outside. • outside and alone. • Outside.	within the classroom has also been effective.
• desk with bungy cord • I like the desk with the bungee cords • on the floor with a soft pillow against a wall and a desk like ms berry's on the floor • a seating desk • A standing desk • floor or desk • I like to sit on the floor, because it is really helping me • a place with chairs,some were to lay down and read, and a place were you can color or draw.	• My students prefer selecting where they want to sit (chair, floor, or standing). They like writing on alternative surfaces (windows, dry erase boards, the floor w/ dry erase markers) or anything different from the norm of pencil/paper work.
• very quiet • A quiet place to work in. • A place that is comfortable and quiet • in a place where you get to seat in soft chairs make it more fun and cozy	
• Again, I don't see much of a difference at all, I really just want to sit somewhere that is comfortable. • more comfortable and workative • by my self in a coner	
• A classroom that uses group work. • The best learning space for is a place where I can work with materials, and other students but still be learning what I need to know.	

Describe the best learning space for you.	Describe the best learning spaces for your students.
• I enjoy to be comfortable and have the ability to socialize.	
• computer lab	
• I think I like the computer lab, for coding reasons.	
• the computer lab and any where away from the classroom because anywhere outside of the classroom is different.	
• The Computer Lab	
• and library	
• and the librery	
• Library, or any place with many books. If finished with the priority of work, students can read or work on anything extra.	
• makerspace	
• The MakerSpace because it has a lot of fun things	
• The lab.	
• Science lab	
• colorful, lots of building materials (like the maker space) cool chairs and computers with building games like PAINT Micro.	
• Reading and Math	
• reading and social studies	
• math is the best for me	
• text evidence and learning how to use my stratigies	
• The best learning space for me is, out in the field (metaphorically of course) discovering new things, and finding ones we haven't seen in a while!	

APPENDIX P

STUDENT PERCEPTION QUESTIONNAIRE RESPONSES: IN WHAT KIND OF SPACE DOES YOUR

TEACHER FEEL MORE COMFORTABLE TEACHING? WHY DO YOU THINK THAT?

5th Grade	6th Grade

• Wilson the garden
• My teacher Mrs. Wilson feels more comfortable in her room because she always explains the assignment and then she starts to grade papers and helps people who need it.
   • Mrs. Wilson, In the classroom because of:
   1. it is more easy to make shore the kids are on task
   2. it is more profitably organized
   3. she knows where everything, and everybody, are.
	• Mrs. Bennet: in a classroom, because she hardly takes us out of it a lot.
	the classroom because Mrs. Bennet has all the space she needs to teach was we need to know and she never really takes us out of the classroom.
	Mrs. Bennet seems to like teaching in a classroom space, because she looks cofterable
	• ms. Bennet a quit place
	• Classroom, Mrs. Bennet seems to enjoy teaching in the classroom, we usually never leave the classroom.
	• I think that Mrs. Bennet prefers her teaching stool, because that way she can see us all at the same time.

• Wilson - flex lab because she wants us to learn, have fun, and be comfertable. • Mrs. Wilson: Flex lab because I feel she wants us to learn, have fun, and be comfortable at the same time. • reading because i think Mrs. Wilson was good at reading and she knows a lot about the subject and gives us hard and easy work so we learn. • Reading, because she likes to read a lot of books when we are working or on the computer and library	• Mr. Lee: in a formal, because he only takes us to the computer lab once a week. • Mr. Lee a fun place • (We go to the computer lab once a week in math for Think Through Math).
• Mrs. Smith - the courtyard, she teaches us about nature and we can sometimes work with the animals or garden with her. • Mrs. Smith in the flex lab because she takes us in there more than the reading lounge • Smith the computer lab • Mrs. Smith, I think she likes the courtyard because sometimes we go there and she put the chickens there Mrs. Smith colorful, Because she is a bubbly person. • Mrs. Smith she likes the flex lab because it gives her time to relax	• Ms. Howard: in a formal classroom, because she does not take us to the science lab much anymore. • ms. Howard a parntering place

5th Grade	6th Grade
• Mrs. Smith flex lab.	
• Martin the lab,	• class room we are all together so it makes it easy to teach.
• Mrs. Martin the science lab	• In the classroom, because there are many of us, and they might not be able to control us
• Harris the classroom,	
• Math, because she is always comfortable, and knows everything	
• For Mrs. Harris is her room because i think she feels more comfortable with her things being there so she can use when she needs them.	• i feel like in the classroom because she already has everything organiniesed the class room because there it less noise.
• Ms. Harris, I think she likes teaching math, because she really likes explaining it, even more, she loves it	• I think my teach feels more comfortable teaching in a classroom because they are more used to it.
• Other Responses	• The classroom because he has more controll
• All four classrooms because we focus on the teachers and not what anyone else is doing.	• I think my teachers feel more comfortable teaching in their classrooms because we rarely go out of the classroom to learn
• the classroom because they show us what needs to be done	I would have to say in a formal learning space, because in those kinds of places a teacher has more control of what is going on.
• The class room.	
• Her room, because they talk more about things they feel comftorble to say.	• My teachers classroom, because he/she knows where everything is and has the control of their own space.
• The classroom. I think that it just feels more like home to them. class because then we would not play around with things we don't have in the classroom.	• The classroom, because we never go anywhere else.
• i think in the class rooms because in like other spaces to learn we could sometimes get out of focus	• I'd say the classroom, because they have all of their materials there needed to teach.
• I think all the teachers would like a place where the students are comfortable instead of the classrooms.	• in the class room
• In their classrooms.	
• A classroom because they can tell us what they want too	
• I think they feel cconfertable in a normal class because it is the normal	
• classroom easier to see every body	• class room, because we don't ever go to a learning space
• i think in her class because she feels more comfortable	• In a classroom, because a classroom is a more comfortable place
• her own class because she is always happy	• Learning Space/Environment: Classrooms

- the regular class because she is more comfortable in that invierment
- the flex lab
- flex lab
- In the flex lab because it has more space.
- Flex Lab because that is where the teacher is okay with the students having fun while they learn and do work
- All the teachers have many colors and creative stuff in their rooms to give us ideas for our work.
- the front of the class room
- sitting on the table because it makes me see her
- Reading lounge, it is for reading
- Library because it`s a nice quiet place somewhere to read murder mystery
- Small group because it helps better when the teacher talks to everyone in my group.

- A classroom, because we can't get distracted
- In the classroom, because i think they don't want us to get distracted in something other than what were doing.
- I classroom it is think in the classroom because we are always learning in the classroom.
- The Classroom, everyone is able to be monitored and there are special resources in the classroom.
- Formal learning spaces because, it's there room they mostly work in their classrooms.
- I think the class room because its just us.
- classroom
- in the classroom
- i think in the easyier.

- because they are good at doing what they do

- A classroom with sitting and standing desks. It is what she is doing right now so she probably likes it.
- Where the students feel comfortable. Because she wants us to feel comfortable, and learn at the same time.

Note: Student responses are grouped by like responses.

APPENDIX Q

STUDENT PERCEPTION QUESTIONNAIRE RESPONSES: WHAT DO YOU THINK IS THE

RELATIONSHIP BETWEEN LEARNING SPACES IN SCHOOL AND HOW WELL YOU LEARN?

Category	Response
Comfort	• we get to have fun and be comfortable instead of cramped up in classroom and we get to relax. • Comfortable and fun classrooms make learning easier. • If your in a bleh learning space your not awake your sleepy< but with a awsome learning space your awake and happy. • if you are in a comforboll it helps me learn • i think it's pretty good because i pay more attention when i'm comfortable in the reading lounge or in the flex lab. • I think the relationship is that the more comfy learning spaces are to the students the more they can focus. • i think in the normal chairs it not that confortable so im constantly moving • They make us feel relax and chill while we are working • I think the relationship is good. And I learn very good when I am in a comfortable place. good cause there are differnent ways of learning i think we learn more because we are more focus than being in a chair everyday in the class rooms • It makes learning easier for me, because I don't like sitting at a desk for four and a half hours. • i think that different have different ways of learning like the seating • Most kids don't like sitting in a classroom all day, so I think every once in a while we should get to go somewhere other than our classroom for a special lesson. You can use the learning space to your advantage, by using the materials. That could have an impact on our learning, it will grab our attention and keep it. • I think the relationship is, that when we are relaxed we read better. But when we have more tension, we work better when we are at a desk.

163

Category	Response
	• Learning spaces are such much quieter and more roomy
Fun	• it learn helps us learn in a fun way • I think the relationships are for us just to have fun and we learn better if our mind is open and having fun. • I think kids learn more because they get to learn in a fun way. • I think we learn better in the learning spaces because people can have fun while learning new things. • depending on where we are we turn boring things to fun things and sometimes fun things to boring thing • It makes learning fun • its fun get to work in partners and its quiet .
Learn in a different place	• They give us a space to learn and interact at the same time. • the relationship is kids want somewhere where their free to say things they are allowed to say. • well, some people like to move some like to stay still so it matters to the differnt learning spots • I think sometimes we need to go somewhere else to improve our grades instead of always being in the classroom • i think that the learning spaces just helps us learning in different places but how we learn it i just showing different ways to learn things
Learn more about different things	• you can probobly learn about different things of how they are used or learn more about why they put the learning space there. • The differences are what type of learning it is and I learn pretty well • It helps you learn better. • they can help us learn even more • They both help us learn, in different ways • They help you with your creative side

Category	Response
	being nice and colorful may give some of us ideas. • they're used to help kids think, and focus on different assignments. • I think the learning spaces are helpful for kids to understand better • that the better the learning space the easier it is to learn • it is better to learn in a learning space • I honestly do better when being able to have something to fidget with
Relationship – outside the classroom	• A great relationship, the environment of this school provides good learning opportunities • they have a good relationship • it is good to have a different environment • it is pretty good i love learning science and reading • i think it is good • good • It's good pretty good it will help me in the future. • Good • pretty good • good, because when i learn outside the classroom i feel like i don't need to sit in those really hard chairs in the classrooms. • I think its a good one
Learning in different environments – no effect.	• I don't think it really matters as much to me. Just as long as it is somewhere quiet. • For me I can learn just about anywhere, but I guess the teachers could make it a little more fun. • Learning in different environments doesn't effect me that much, but the projects in the science lab do • I don't see much of a difference at all, I really just want to sit somewhere that is comfortable. • I think it does not really matter where you learn • The relationship is we learn ether way.

Category	Response
	• Same thing because, they both teach us stuff. • They both have all sorts of ways of teaching
Distractions	• it depends on how quiet it is • The learning spaces sometimes distracts us. • strong but the people who have ADHD can have a no distraction area • i think i learn more in the reading lounge but in the fun place is to loud and i get off task • The seating arrangement might distract a lot of people • some spaces help me learn better but others don't because I get to destracted to learn anything like in the reading lounge. • They don't bother as long as the volume is at a minimum. • bad because the drastrack me
Undecided	• i dont know. • i don't know • I don`t really know
Classroom preference	• I think I learn better in a more closed and educational learning place. • I think I learn pretty well in the classroom • like an ragular class
Surroundings	• The surroundings on where someone works, can affect the work sometimes. • It will help people feel like there not traped in a classroom.
Do not use	• i like them but we do not use them. • Like I said before, I really don't use them that much, but when I do, I tend to learn better in the classroom.
Varied responses	• fine • average • they are good materials • All the learning spaces are amazing there is never something wrong with it just the

Category	Response
	space i would want to get better.
• well i learn well cause i get good grades
• it is great it makes me feel i can do my work without consetrating to hard

Note. Student responses are grouped by like responses.

REFERENCES

Aina, S. I. (2015). School environment and satisfaction with schooling among primary school pupils in Ondo State, Nigeria. *Journal of Education and Practice*, *6*(12), 148-151.

Airbnb.com. (n.d.). *Building at Airbnb: Learn together*. Retrieved from https://www.airbnb.com/careers/departments/engineering

Ariani, M. G., & Mirdad, F. (2016). The effect of school design on student performance. *International Education Studies, 9*(1), 175-181.

Bain & Company. (2017). *A supportive culture*. Retrieved from http://www.bain.com/careers/why-bain/support.aspx

Baker, L. (2012). *A history of school design and its indoor environmental standards, 1900 to today*. Washington, DC: National Clearinghouse for Educational Facilities.

Ball State University. (2010). *Gary and Jerri-Ann Jacobs High Tech High: Case study.* Retrieved from http://cms.bsu.edu/-/media/WWW/DepartmentalContent/BBC/CharterSchools/PDFs/13%20Gary%20and%20JerriAnn%20Jacobs%20High%20Tech%20High.pdf

Biermeier, M. A. (2015). Inspired by Reggio Emilia: Emergent curriculum in relationship-driven learning environments. *Young Child Journal, 70*(1), 72-73.

Bill and Melinda Gates Foundation. (2012). *Asking students about teaching: Student perception surveys and their implementation. MET project: policy and practice brief.* Retrieved from http://files.eric.ed.gov/fulltext/ED566384.pdf

Booren, L. M., Downer, J. T., & Vitiello, V. E. (2012). Observations of children's interactions with teachers, peers, and tasks across preschool classroom activity settings. *Early Educational Development, 23*(4), 517-538. doi:10.1080/10409289.2010.548767 Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4337404/

Brooks, D. C. (2010). Space matters: The impact of formal learning environments on student learning. *British Journal of Educational Technology, 42*(5), 719-726. doi:10.1111/j.1467-8535.2010.01098.x

Brown, M., & Long, P. (2006). Trends in learning space design. In Oblinger, D. (Ed.), *Learning spaces* (pp. 9.1-9.11). Retrieved from https://net.educause.edu/ir/library/pdf/PUB7102.pdf

Bruner, J. (1977). *The process of education: A landmark in educational theory*. Cambridge, MA: Harvard University Press.

Bryman, A. (2012*). Social research methods*. New York, NY: Oxford University Press.

Campbell, L., & Campbell, B. (1999). *Multiple intelligences and student achievement: Success stories from six schools*. Alexandria, VA: ASCD Publications.

Cannon Design, VS Furniture, & Bruce Mau Design. (2010).*The third teacher: 79 ways you can use design to transform teaching & learning*. New York, NY: Abrams.

Carr, A. (2010). *The most important leadership quality for CEOs? Creativity.* Retrieved from https://www.fastcompany.com/1648943/most-important-leadership-quality-ceos-creativity

Center for Advanced Professional Studies. (2016). *Our vision*. Retrieved from https://securelb.imodules.com/s/1403/hs-redesign/start.aspx?sid=1403&gid=1&pgid=61

Coffeen, K. (2014, March 31). *Five trends in K-12 school design everyone should consider* [Web log post]. Retrieved from http://blog.lpainc.com/lpa-blog/bid/109751/Five-Trends-in-K-12-School-Design-Everyone-Should-Consider

Cognition. (2002). In *The American Heritage® Science Dictionary*. Retrieved from http://www.dictionary.com/browse/cognition?s=t

Cohen, L., Manion, L., & Morrison, K. (2005) *Research methods in education* (5th ed.). Abingdon, UK: Routledge Falmer.

Copple, C., & Bredekamp, S. (Eds.). (2010). *Developmentally appropriate practices in early childhood programs serving children from birth through age 8* (3rd ed.). Ontario: Pembroke Publishers.

Cuban, L. (2004). The open classroom. *Education Next, 4*(2). Retrieved from http://educationnext.org/theopenclassroom/

Cuban, L. (2009, December 5). *Fad or tradition: The case of the open classroom* [Web log post]. Retrieved from https://larrycuban.wordpress.com/2009/12/05/fad-or-tradition-the-case-of-the-open-classroom/

Daggett, W. R., & Jones, R. D. (2014). *The process of change: Why change, what to do, and how to do it.* Retrieved from http://www.leadered.com/pdf/Process_of_Change_2014.pdf

Danielson, C. (2007). *Enhancing professional practices: A framework for teaching* (2nd ed.). Alexandria, VA: ASCD Publications.

Dewey, J. (1990). *The school and society and the child and the curriculum* (Rev. ed.). Chicago, IL: The University of Chicago Press.

Dill, K. (2015, December). *The 10 best places to work in 2016.* Retrieved from
        https://www.forbes.com/sites/kathryndill/2015/12/14/the-best-places-to-work-in-
        2016/#42bbb63aceee

Downer, J. T., Booren, L. M., Lima, O. K., Luckner, A. E., & Pianta, R. C. (2010). The individualized
        classroom assessment scoring system (inCLASS): preliminary reliability and validity of a
        system for observing preschoolers' competence in classroom interaction. *Early
        Childhood Research Quarterly, 25*(1), 1-16.

Editors of Encyclopædia Britannica. (2017). *Monitorial system.* Retrieved from
        https://www.britannica.com/topic/monitorial-system

Education News. (2013, April 16). *America public education: An origin story* [Web log post].
        Retrieved from http://www.educationnews.org/education-policy-and-politics/american-
        public-education-an-origin-story/

Ehmann, S., Borges, S., & Klanten, R. (2012). *Learn for life: New architecture for new learning*.
        Berlin: Die Gestalten Verlag GmbH & Co.

Ertmer, P. A., & Newby, T. J. (2013). Behaviorism, cognitivism, constructivism: Comparing
        critical features from an instructional design perspective. *Performance Improvement
        Quarterly, 6*(4), 50-72.

Gardner, H. (1999). *Intelligence reframed: Multiple intelligences for the 21st century*. New York,
        NY: Basic Books.

Gehl, J. (2011). *Life between buildings: Using public space*. Washington, DC: Island Press.
        (Original work published 1971)

Gianoutsos, J. (2006). Locke and Rousseau: Early childhood education. *The Pulse, 4*(1), 1-23.

Glassdoor.com. (2016). *Best places to work: 2016 employees' choice.* Retrieved from
        https://www.glassdoor.com/Award/Best-Places-to-Work-LST_KQ0,19.htm

Goldhaber, D., (2000). *Theories of human development: Integrated perspectives*. Houston, TX:
        Mayfield Publishing Company.

Gordon, D. (2010). *Student commons.* Retrieved from http://www.ncef.org/pubs/commons.pdf

Gregory, G., & Kaufeldt, M. (2015). *The motivated brain: Improving student attention,
        engagement, and perseverance*. Alexandria, VA: ASCD.

IBM Institute for Business Values. (2010). *Refining competition: Insights from the global C-suite
        study – the CEO perspective.* Retrieved from http://www-01.ibm.com/common/ssi/cgi-
        bin/ssialias?subtype=XB&infotype=PM&htmlfid=GBE03719USEN&attachment=GBE0371

9USEN.PDF&cm_mc_uid=36788419335514540780823&cm_mc_sid_50200000=1454423499

Jensen, E. (2003). *Environments for learning*. San Diego, CA: The Brain Store.

Juvova, A., Chudy, S., Neumeister, P., Plischke, J., & Kvintova, J., (2015) Reflection of constructivist theories in current educational practice. *Universal Journal of Educational Research, 3*(5), 345-349.

Keating, S., & Gabb, R. (2005). *Putting learning into the learning commons: A literature review.* Retrieved from http://vuir.vu.edu.au/94/1/Learning%20Commons%20report.pdf

Kilgore, S. B., & Reynolds, K. J. (2011). *From silos to systems*. Thousand Oaks, CA: Corwin.

Kleberg, J. R. (1992). *Quality learning environments.* Retrieved from http://files.eric.ed.gov/fulltext/ED354613.pdf

Kritzenberger, H., Winkler, T., & Herczeg, M. (2002). *Mixed reality environments as collaborative and constructive learning spaces for elementary school children.* Retrieved from http://files.eric.ed.gov/fulltext/ED477046.pdf

Kuuskorpi, M., & González, N. C. (2011). *The future of the physical learning environment: School facilities that support the user*. Retrieved from https://www.oecd.org/edu/innovation-education/centreforeffectivelearningenvironmentscele/49167890.pdf

Lackney, J. A. (2000). *Thirty-three educational design principles for schools & community learning centers.* Retrieved from http://files.eric.ed.gov/fulltext/ED450544.pdf

Lake Country Service Cooperative. (2016). *Social interaction observation form.* Retrieved from http://lcsc.org/Page/54

Le, T. (2010). *Redesigning education: Rethinking the school corridor.* Retrieved from https://www.fastcodesign.com/1598539/redesigning-education-rethinking-the-school-corridor

Learning Spaces and Learning Styles. (2016). *Survey questions.* Retrieved from http://www.learningspacesandlearningstyles.com/survey-questions.html

Lehmann, C., & Chase, Z. (2015). *Building school 2.0: How to create schools we need*. San Francisco, CA: Jossey-Bass.

Liu, C. C., & Chen, I. J. (2010). Evolution of constructivism. *Contemporary Issues in Education Research 3*(4), 63-66.

Loertscher, D. V., & Koechlin, C. (2014). Climbing to excellence: Defining characteristics of successful learning commons. *Knowledge Quest*, *42*(4), E1-E10.

Lui, C. H., & Matthews, R. (2005). Vygotsky's philosophy: Constructivism and its criticism examined. *International Education Journal, 6*(3), 386-399.

Lyons, J. B. (2001). *Do school facilities really impact a child's education?* Retrieved from http://files.eric.ed.gov/fulltext/ED458791.pdf

McGregor, J. (2004). Spatiality and the place it the material in schools. *Pedagogy, Culture and Society, 12*(3), 347-372.

Medina, J. (2014). *Brain rules: 12 principles for surviving and thriving at work, home, and school*. Seattle, WA: Pear Press.

Mendell, M. J., & Heath. G. A. (2004). *Do indoor environments in schools influence student performance? A review of literature.* Retrieved from http://escholarship.org/uc/item/7zw1g26t

Montessori, M. (2012). *The Montessori method*. Seattle, WA: CreateSpace Independent Publishing Platform.

Montgomery, T. (2008). Space matters. *Active Learning in Higher Education, 9*(2), 122-138.

Nair, P. (2011). The classroom is obsolete: It's time for something new. *Education Week, 30*(37). Retrieved from https://www.edweek.org/ew/articles/2011/07/29/37nair.h30.html

Nair, P. (2014). *Blueprint for tomorrow: Redesigning schools for student-centered learning*. Cambridge, MA: Harvard Education Press.

Nair, P., & Gehling, A. (2011). Life between classrooms: Applying public space theory to learning environments. In Transforming Croydon Schools Team, *Reshaping our learning landscape: A collection of provocation papers* (pp. 27-32). Retrieved from http://www.designshare.com/images/LearningLandscapeNairGehling.pdf

National Center for Education Statistics. (2006). *4.3.1 space use codes: Definitions, descriptions, and limitations: 100 classroom facilities.* Retrieved from https://nces.ed.gov/pubs2006/ficm/content.asp?ContentType=Section&chapter=4&section=3&subsection=1

Neisser, U. (1976). *Cognition and reality*. San Francisco, CA: Freeman.

Nemeth, J. (2012). Controlling the commons: How public is public space? *Urban Affairs Review, 48*(6), 811-835.

New, R. S. (2007). Reggio Emilia as cultural activity theory in practice. *Theory into Practice, 46*(1), 5-13.

Nigaglioni, I. (2010). Learning environments matter: Taking learning outside the classroom. In A. Holigsfeld & A. Cohan (Eds.), *Breaking the mold of school instruction and organization:*

innovative and successful practices for the twenty-first century (pp. 191-198). Lanham, MD: Rowman & Littlefield Education.

Nodoushan, M. A. S. (2014). Cognitive versus learning styles: Emergence of the ideal education model (IEM). *i-manager's Journal on Educational Psychology, 8*(2), 31-39.

Nussbaum, P. D., & Daggett, B. (2008). *What brain research teaches about rigour, relevance and relationships: And what it teaches about keeping your own brain healthy*. Rexford, NY: International Center for Leadership in Education.

Ozerem, A., & Akkoyunlu, B. (2015). Learning environments designed according to learning styles and its effects on mathematics achievement. *Eurasian Journal of Educational Research, 61,* 61-80. Retrieved from http://www.ejer.com.tr/0DOWNLOAD/pdfler/tr/akkoyunlu61.pdf

Patrick, H., Ryan, A. M., & Kaplan, A. (2007). Early adolescents' perceptions of the classroom social environment, motivational beliefs, and engagement. *Journal of Educational Psychology 99*(1), 83-98.

Perception. (n.d.). In *Merriam-Webster's online dictionary.* Retrieved from https://www.merriam-webster.com/dictionary/perception

Powell, S. D. (2013). *Learning modalities*. Retrieved from https://www.education.com/reference/article/learning-modalities/

Robinson, K. (2010, October). *Ken Robinson: Changing education paradigms* [video file]. Retrieved from https://www.ted.com/talks/ken_robinson_changing_education_paradigms

Robinson, K. (2015). *Creative schools: A grassroots revolution that's transforming education*. New York, NY: Penguin Books.

Ronan, T., & Freeman, A. (2007). *Cognitive behavior therapy in clinical social work practice*. New York, NY: Springer Publishing Company.

Room type codes. (n.d.). *Definitions, descriptions, and limitations*. Retrieved from https://www.umkc.edu/finadmin/cfm/documents/Room-Type-Codes-Definitions-Descriptions-and-Limitations.pdf

Rudd, P., Reed, F., & Smith, P. (2008). *The effects of the school environment on young people's attitudes towards education and learning: Summary report.* Berkshire, UK: National Foundation for Education Research.

Scheer, A., Noweski, C., & Meinel, C. (2012). Transforming constructivist learning into action: Design thinking in education. *Design and Technology Education: An International Journal, 17*(3), 8-19.

Schlechty, P. (2011). *Engaging students: The next level of working on the work*. San Francisco, CA: Jossey-Bass.

Schneider, M. (2002). *Do school facilities affect academic outcomes?* Washington, DC: National Clearinghouse for Educational Facilities. Retrieved from http://www.ncef.org/pubs/outcomes.pdf

Smith, E. R., & Semin, G. R. (2007). Situated social cognition. *Current Directions in Psychological Science, 16*(3), 132-135.

Snyder, T., de Brey, C., & Dillow, S. (2016). *Digest of educational statistics.* Retrieved from http://nces.ed.gov/programs/digest/d14/tables/dt14_217.10.asp

Sroufe, L., Cooper, R., & DeHart, G. (1996). *Child development: its nature and course* (3rd ed.). New York, NY: McGraw-Hill.

Stack, G. (2012, June 20). *10 current school facility features that are obsolete* [Web log post]. Retrieved from http://schooldesignmatters.blogspot.com/2012/06/10-current-school-facility-features.html

Tanner, C. K. (2008). Effects of school design on student outcomes. *Journal of Educational Administration, 47*(3), 381-399.

Tennessee Advisory Commission on Intergovernmental Relations. (2003). *Do K-12 school facilities affect education outcomes?* Retrieved from https://www.tn.gov/assets/entities/tacir/attachments/SchFac.pdf

Tudge, J. R. H., & Winterhoff, P. A. (1993). Vygotsky, Piaget, and Bandura: Perspectives and the relations between the social world and cognitive development. *Human Development 31*, 61-81. Retrieved from http://systemofcare.uncg.edu/hdf/facultystaff/Tudge/vpb93.pdf

Vygotsky, L.S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Waldorfschoolrf.com. (2016). *Learning environment*. Retrieved from https://www.waldorfschoolrf.com/admissions-enrollment/learning-environment/

Wood, G. H. (1992). *Schools that work: America's most innovative public education programs*. New York, NY: Plume.

Wright, S., & Cowen, E. L. (1982). Student perceptions of school environment and its relationship to mood, achievement, popularity, and adjustment. *American Journal of Community Psychology. 10*(6), 687-703.

Yildirim, M. C. (2014). Developing a scale for constructivist learning environment management skills. *Eurasian Journal of Educational Research, 54,* 1-18.

Yilmaz, K. (2008). Constructivism: Its theoretical underpinnings, variations, and implications for classroom instruction. *Educational Horizons, 86*(3), 161-172.

Zillow.com. (2016). *Careers*. Retrieved from https://www.zillow.com/careers/