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Classroom Design for Urban Students

A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Education

by

Gabriel Anthony Ramirez
ABSTRACT OF THE DISSERTATION

Classroom Design for Urban Students

by

Gabriel Anthony Ramirez

Doctor of Education

University of California, Los Angeles, 2014

Professor Connie Kasari, Co-Chair

Professor Faye Peitzman, Co-Chair

This study investigated how modifying the physical design of the classroom could positively impact the behavioral engagement (on-task behavior) and anxiety levels of ninth and twelfth grade students in an urban high school. Data collection methods included an AB multiple baseline design, biometric data, and student surveys. Visual inspection of data revealed that all participants’ on-task behavior increased significantly during the intervention phase of the study. While participants’ heart rate decreased during the intervention phase, all participants’ heart rate fell within the average resting heart rate range suggesting less significant results. Students surveyed did indicate feeling less stressed in the modified classroom. This study did produce findings that indicate that classroom design can positively impact on-task behavior and anxiety, calling attention for the need to incorporate intellectual, emotional and physical accommodations to support student learning.
This dissertation of Gabriel Anthony Ramirez is approved.

Todd Franke

Sandra Graham

Connie Kasari, Committee Co-Chair

Faye Peitzman, Committee Co-Chair

University of California, Los Angeles

2014
DEDICATION

To my mom and dad. Thank you for all your love and support. To my family, friends, colleagues, and students who have supported me in my efforts. Also, a special thanks to Gaiam Inc. for your generous donation. Thank you.
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Education and Certifications

M.A. Education (English)
University of California, Los Angeles, Graduate School of Education & Information Studies. 2002

Bachelor of Arts English: British Literature
University of California, Los Angeles. 2000

Certifications

National Board Certification – English Language Arts/Adolescence and Young Adulthood. 2005

State of California: Professional Clear Single Subject – English Language Arts/CLAD. 2001


Employment and Experience

English Teacher
PUCS Schools – ECALS, Los Angeles, CA, November 2013-July 2014
• Teach 9th grade humanities, 12th grade, and AP Lit.
• Humanities lead teacher
• Develop curriculum for humanities and AP Lit.
• Collaborate with English dept.

Assistant Principal (Founding)
Larchmont Charter School, Los Angeles, CA, August 2012-August 2013
• Develop and monitor curriculum (A-G aligned) for all students (including English Learners, Special Education, and GATE)
• Develop school culture (i.e. – school-wide activities, student leadership, school traditions, PD, communication with families, school website)
• Assist the principal in coordinating and implementing teacher evaluation procedures, PD for faculty, including new teacher support
• Maintain a positive school climate that ensured the safety, health and welfare of students

English Teacher
Larchmont Charter School, Los Angeles, CA, August 2011-2013
• Teach 7th and 8th grade English while providing ELA support
• Create a constructivist curriculum that is culturally relevant and project-based
• Work with colleagues to create a school that is rigorous, inclusive, and that promotes a college-going culture.

NBPTS Instructor/Facilitator
The Support Network, Los Angeles, CA, August 2008-2011
• Evaluate and assess curriculum, teaching strategies, and the use of standards.
• Be knowledgeable in various content areas and best practices.
• Help teachers reflect on personal pedagogy in order to better serve their students
• Organize & facilitate study sessions in order to prepare teachers to become Nationally Board Certified

Administrator/Principal Teacher
Bright Star Schools, Los Angeles, CA, August 2010-January 2011
• Administrator who led weekly department meetings to provide teacher support and instructional guidance.
• Coordinate and proctor state assessments such as CELDT & STAR exams.
• Provide Professional Development in writing and reading.
• Work on administrative team to enhance and reform school vision

English Teacher
Harvard-Westlake School, Los Angeles, CA, August 2008-September 2009
• Collaborate with English Department to discuss curriculum and pedagogy
• Teach 7th & 8th grade English and work in collaborative teams
• Participate in admissions and recruitment
• Support & participate in overall school activities.

English Teacher/Drama Teacher (Lead Teacher)
Roosevelt Math, Science, & Technology Magnet, Los Angeles, CA, 2001-2008
• Department lead whose role was to ensure vertical planning and write standard based curriculum. Organize and implement student-centered educational programs
• Classes taught: 9th grade Sheltered, Regular, and Honors, 10th grade Regular and Honors, 11th, & 12th grade Regular and AP: English Literature and Composition
• Provide academic counseling and college workshops
• Produce Fall and Spring play. Organize fundraising activities to raise approx. $10,000 for productions every year

Additional Roles

Professional Development Collaborator & Presenter
Theodore Roosevelt High School, Los Angeles, CA, 2003 - 2008
• Prepared & presented curriculum development to colleagues regarding better teaching practices, such as: Scaffold Strategies in Writing, Classroom Management Practices and Reading Strategies

Standards-Based Curriculum Development Committee
Theodore Roosevelt High School, Los Angeles, CA, 2001-2005
• Aligned California English/Language Arts standards to classroom curriculum
• Collaborated with colleagues to align English department curriculum
CHAPTER ONE: STATEMENT OF THE PROBLEM

Introduction

Completion from high school is one of the most important issues concerning educators today (Finn, 1989; Lee & Burkam, 2003). In fact, graduating high school is considered to be a major milestone for students as they make their way through the educational pipeline; however, it is estimated that 1.2 million students drop out every year (Porowski & Passa, 2011). Dropping out has been defined as a long term process of disengagement and has been construed as a form of social deviance (Alexander, Entwisle, & Horsey, 1997; Wehlage, 1986). Dropping out of high school has a generational effect in that students who drop out have children with lower academic achievement and attainment (Archambault, Janosz, Morizot, & Pagani, 2009a). Studies have shown that dropping out has negative effects such as risky health and attitudes and lowers an individual’s lifetime earnings (Archambault, Janosz, Morizot, et al., 2009a). It is clear that a student who does not attain a high school diploma can embark on a life with limited or negative outcomes.

Minority students have been struggling within the American education system for many years, and this issue has prompted a great deal of research to identify the problem and provide possible solutions (Reyes, Gillock, Kobus, & Sanchez, 2000). Of the total population of students in the United States, 40% are ethnic minority students, a statistic that validates the need to attend to this population (Faircloth & Hamm, 2005). Typical U.S. classrooms are described as attending to the needs and reflecting the practices of the dominant culture; however, there are researchers that argue that since minority students perceive the world differently, these students would benefit from strategies and an education system that is tailored to their learning style and embodies elements of their culture (Faircloth & Hamm, 2005; Gay, 2002; Ladson-Billings, 1995;
Ware, 2006; Young, 2010). Research shows consensus that there are factors beyond the individual that contribute to the failure of minority students (Durden, 2008; Solórzano & Solórzano, 1995). These factors include socioeconomic conditions, behavioral issues, social inequalities, and schooling conditions. Many white and Asian children, who are more likely to succeed, tend to have the engrained values of school such as competition and independent learning whereas those who fail in school, like Black and Latino children, are unable to “assimilate, code switch, or culture switch to the dominant culture” (Ware, 2006). Educators, both researchers and practitioners, are charged with finding solutions to closing the achievement gap, making schools relevant to students of color, and getting students to complete their high school education.

The literature on students who drop out seems to put the blame on the students for their academic failures (Finn, 1989). In fact, most studies focus on the internal characteristics that most likely predict a student’s inability to complete the journey through the educational pipeline. These types of studies shift the responsibility from the schools to the students, and essentially give schools an out from addressing the issue of dropping out (Knesting, 2008). Schools that subscribe to this model of student blame are placing students into a vacuum of failure and are leaving them to fend for themselves. Archambault, Janosz, Fallu, et al. (2009) state that Social Control Theory places a great deal of importance on students’ feelings of belonging and their social/emotional connection to institutions like school. In fact, it is suggested that antisocial behavior and disengagement could be a result of a breakdown between student and institution. Ultimately, a negative school environment reinforces the negative views these students have of themselves (Knesting, 2008). While there have been multiple studies on why students drop out,
there are others who believe that students do not, in fact, drop out; rather they are being pushed out.

This phenomenon of being pushed out suggests that schools are not implementing changes that make students feel connected and/or comfortable within the classroom or school as a whole. The term “pushed out” implies that the student did not adapt to the school’s norms and criteria for success, and, therefore, the student was exited from the school, directly or indirectly. Research speaks to the importance of creating a school environment that allows students to feel like they are part of a community (Reschly, 2009). Battistich, Solomon, Watson, & Schaps (1997) believe that when the school community establishes itself as a place of support, a place where a student can have an active voice, and where a student feels a sense of belonging, a student will feel like his or her needs are being met. The result is that the student will feel a deeper connection to the school and will feel more inclined to adhere to the values and norms that the school has set. Clearly, research identifies the benefit of positive relationships between teacher and student (Denti & Guerin, 1999), but I believe that utilizing the teacher and his or her skill set as a form of intervention is not sustainable. While students do benefit from teachers who are caring, develop relevant curricula, and invest in their well being, what happens to students who leave this teacher? At-risk students can revert back to a state of apathy because they no longer have the external motivation they were receiving from their teacher. Factors such as a high number of students, limited resources, and parents who do not advocate for their child impede teachers from attending to every student, and ultimately, prevent students who are at-risk from becoming self-motivated. While there are those who would argue that the solution is to ensure that all teachers invest in their students, this is not sustainable nor does it address the core problem—internal motivation. One of the major goals of educators is to have students become
independent and self-reliant, but the current strategy of having teachers shoulder all the burdens of a student learning does not allow students to develop the intrinsic motivation necessary to become truly successful. While I believe that the teacher’s role is absolutely valuable, there is a body of literature that is less attended to by researchers that suggests that physical environment (i.e. - classroom design and furniture) can be a crucial factor in helping students feel comfortable and ready to learn (Davis & Fox, 1999; Wingrat & Exner, 2005a). This study attempts to design a classroom that will improve a student’s behavioral engagement (i.e. - a student’s on-task behavior) and reduce anxiety. My intent is to design a classroom that not only attends to the various modalities of learning, but reduces anxiety and feelings of discomfort so that students, particularly those who come from harsh environments, can re-direct their energy towards learning. A positive environment is key to a student’s success.

In the following sections, I first provide background information on a person’s biological sensitivity to context, the theoretical framework on which this study is grounded. I will then briefly describe a student’s sense of belonging and its relation to fear and anxiety. Next, I will define the construct of behavioral engagement as it is a predictor of dropping out. I end with a description and justification of the various modifications I will make to the classroom in this study.

*The Effects of Environment—A Biological Perspective*

Most psychologists are in agreement that a person’s temperament is mostly set at birth, but environment definitely plays a role in shaping a person’s social and emotional behaviors (Kluger, 2012). Over the course of human evolution during times of high stress, people have developed a “biological sensitivity to context” (Boyce and Ellis, 2005, p.271). This term is
suggesting that environment can trigger a psychobiological response from individuals given the particular circumstance:

Environmental events signaling threats to survival or well being produce a set of complex, highly orchestrated responses within the neural circuitry of the brain and peripheral neuroendocrine pathways regulating metabolic, immunologic, and other physiological functions…this elaborate and tightly integrated repertoire of responses results in an immediate, relatively automatic shift to a state of biological and behavioral preparedness, involving increases in heart rate and blood pressure, metabolic mobilization of cellular nutrients, preferential redirection of energy resources and perfusion to the brain, and the induction of behavioral vigilance and fear (pp.272-273).

Humans have developed stress response systems to correspond to the environments they are in. Whether humans want to respond to a particular situation or not, the above description dictates that humans have been wired to respond and feel a certain way in times of threat or discomfort. Robert Kurzban, an evolutionary psychologist, examined neighborhoods with high crime and gang violence, where people had a shorter life expectancy and were more likely to give in to impulsivity. These individuals developed a more apathetic mindset in regards to items of social and personal importance, and they would more likely give priority to items that are more self-gratifying. Their harsh environment had given them a “who cares” attitude (Kluger, 2012).

Students who are at-risk and low-income often come from environments similar to those described above. These students walk through dangerous neighborhoods, fear being robbed, and can come from unstable homes. Understanding that individuals have a biological sensitivity to environment and how this psychobiological response has a direct influence on behavior, it seems reasonable to assume that students who come from harsh environments might bring a “who cares” attitude into the classroom. Since their environment has conditioned them to believe that their life expectancy will be short, students tend to be more impulsive…therefore resulting in students who are more impulsive rather than patient—patience being a quality one needs to be
successful in the classroom. When an environment is safe, one is more likely to be patient in his or her activities in order to reap the reward, but if the environment is dangerous or high stress, one tends to be more impulsive and will try to satisfy the pleasure zone of the brain. Part of students’ struggles has to do with circumstance (personal, societal, and academic), and how these circumstances have placed them into environments that elicit an innate psychobiological response that prevents them from transcending beyond their own personal survival.

There seem to be two issues when looking at students who come from harsh environments: schools do not seem to acknowledge the fact that their external environment has made their students more impulsive, a quality that is not complimentary to a school environment that requires patience. Second, if being exposed consistently to a negative environment creates more impulsive individuals, then why don’t school systems design schools that are more aesthetically appealing and accommodating to the various learning and emotional needs of students? McMahon & Wernsman (2009) state that “students who perceive their school environment as providing equal learning opportunities are likely to demonstrate adaptive psychological and behavioral adjustment” (p.267). Rather, most schools in poor neighborhoods mirror the look and feel of the neighborhoods they reside in and, arguably, enforce these feelings of fear and impulsivity. In both cases, schools show a lack of compassion that “prevents the oppressed from being fully human” (Freire, 2000, p.56). Society has labeled these students as problems even though school systems have done very little to combat the environment from which they come, and the behavioral effects environment has had on their long term goals. Students who come from the inner-city or harsh environments should be able to go to a school that has been designed to improve their emotional and intellectual development. This is not simply a matter of educating more students but is a moral choice our society must make. Studies
have shown that students who have been immersed in positive school environments reap many positive benefits across all age groups (McMahon & Wernsman, 2009).

**Sense of Belonging**

A student’s sense of belonging has long been an item of concern, but there has been renewed interest in students feeling connected to their school community (Finn, 1989; Ma, 2003). Specifically, a sense of belonging has been defined as being accepted, valued, supported, and having feelings of inclusion (Battistich et al., 1997; Ma, 2003). Through utilizing a “participation-identification model,” Finn (1989) notes that when a student does not bond with a school, there is an increased chance that the student will not complete high school. One way a student feels like he or she belongs is through developing relationships with teachers. Studies have shown a positive association between students and teachers in relation to academic engagement, particularly Hispanic students (Finn & Voelkl, 1993; Reyes et al., 2000). A sense of belonging and developing key relationships can significantly increase motivation and achievement, particularly for students of various ethnic groups (Faircloth & Hamm, 2005).

However, Reyes et al. (2000) add that throughout the educational pipeline the school setting changes quite a bit from elementary to high school. School begins in a small close-knit setting, but as a student progresses through high school, the number of teachers increase, and students must learn to adapt and vie for the acceptance of many individuals with different demands. This change in setting can make it difficult for some students to connect and develop key relationships. Not only can the complexity of the school environment prevent a student from developing a sense of belonging, but students may also develop a fear of the school setting. While only a small proportion of students are victimized on-campus, a larger proportion of
students carry a sense of fear throughout the school day. This fear can prevent a student from learning and engaging in school activities (Addington & Yablon, 2011). The school environment can be chaotic in many ways, and this may prevent students from connecting to teachers and their school. While it can be difficult for students to make connections, particularly for urban students and minorities, it is clear that students need to make these bonds to school because a sense of belonging provides a positive mindset for high school completion and personal success.

Behavioral Engagement

While there is a great deal of research that has led schools to invest in relevant curricula to value students’ connection to school community (and being connected to one’s school community), there is another body of less-known research that holds equal validity in understanding why students drop out. Thirty years of research indicate that behavioral engagement of students is a strong predictor of a student’s success in school (Downer, 2007). While there are many constructs related to engagement as a form of behavior, behavioral engagement seems to be most related to students who are at risk to drop out (Archambault, Janosz, Fallu, & Pagani, 2009b). Behavioral engagement is when students are positively “interacting with their physical and social environment in ways that produce learning” (Downer, 2007, p.414). Downer (2007) states that positive behavioral engagement can be sustained and increased through creating an ideal classroom setting. Behavioral engagement is defined as a student’s ability to conform to school/class rules, a student’s on-task behavior, politeness, and willingness to engage in class activities (Archambault, Janosz, Fallu, et al., 2009a; Archambault, Janosz, Morizot, et al., 2009a). For the purpose of this study, I focused only on the on-task component of behavioral engagement.
Creating the Ideal Classroom Environment

Creating a physical environment with the aim to support learning can prevent developmental, social, and emotional problems before they arise (Kasser, 2007). Disruptive behaviors such as fidgeting and moving may be attributed to students feeling uncomfortable in their seats (Wingrat & Exner, 2005a). Furthermore, researchers have stated that classroom furniture may be a mismatch for students because of size and height, resulting in poor posture and off-task behavior (Knight G. & Noyes J., 1999a; Wingrat & Exner, 2005a). Possible solutions to address students’ discomfort with seats are providing students with seats that are ergonomic and desks that are adjustable to student height (Knight G. & Noyes J., 1999a; Wingrat & Exner, 2005a). In two separate studies, where these modifications were made, students’ on-task behavior improved and feelings of the classroom environment being more effective were noted results (Knight G. & Noyes J., 1999a; Wingrat & Exner, 2005a). One type of furniture modification, often used with students with ADHD, is therapy balls, a large inflated ball often used for yoga and other physical activities. The use of a therapy ball is a sensory-based strategy utilized by occupational therapists to increase a student’s attention, on-task behaviors and overall performance. Therapy balls have been linked to increased improvements in behavior and performance because students must activate core musculature to remain balanced which also causes students to remain alert, a key characteristic to remaining on-task and productive (Umeda & Deitz, 2011).

The way a teacher arranges seats is said to be a reflection of how the teacher views his or her students: a rectangular arrangement with the teacher at the front suggests an empty learner waiting to be filled with knowledge, and a circular arrangement suggests that students will be in
a social learning environment (Rosenfield, Lambert, & Black, 1985). While there are some teachers that believe classroom arrangement is less important than developing rapport with students, “the physical and social systems of the classroom are inextricably interdependent” (Rosenfield et al., 1985, p.101). Studies have shown that changes in the physical dimensions or density of the classroom can affect the frequency of interactions among students while other studies show that changing the seat arrangement of the classroom can increase discussion and on-task behavior (Davis & Fox, 1999). The teachers in this study will use these various seating arrangements in relation to the classroom activities used.

While there are many studies on the impact of classroom design at the elementary and college level, there are few studies at the high school level, and no studies that utilized various modifications to attend to a general education class. Weinstein (1979) refers to a study where the traditional college classroom was changed:

- color, movable wall panels, a complex lighting system, and flexible, comfortable seats. Attendance in the experimental room was better than the control group, despite the fact that the section was held at a less convenient time. Students from the experimental group participated more, paid more office visits to the instructor, and there was more informality and group cohesion” (pp.7).

These findings demonstrate that design (i.e. – color, lighting, use of plants) can substantially affect attitudes and behavioral engagement. A study was conducted to observe the effect, if any, that color would have on student behavior and academic performance. Three walls were painted beige to reduce tension, and the front walls were painted blue-gray to reduce eye strain. The results indicated a decrease in off-task behaviors and feelings of lower anxiety (Johnson & Maki, 2009a).

Lighting has been shown to be closely tied to student performance and health (Wu & Ng, 2003). Dunn, Krimsky, Murray, & Quinn (1985) state that the use of light can be a form of
differentiation with the purpose of supporting “one element of learning style” (p.867). Research has shown that students have preferences of illumination while in the classroom, and this was shown in a study where students were given a reading exam in their preferred light setting. Students scored significantly higher in their appropriate light setting as opposed to when they were tested in a light setting that did not match their learning style preference. While it seems impossible for a teacher to have the appropriate lighting for all students, Dunn, Krimsy, Murray, and Quinn (1985) suggest that teachers create spaces using dividers, library walls, and plants to create variations in illumination. In regards to utilizing plants, there is increasing research that supports the idea that nature is “helpful for emotional states, attention, mental fatigue, behavior, and personal health” (Han, 2009, p. 658). Ultimately, students should be given more choice in physical classroom accommodations, and better guidance should be given to educators to create optimal learning environments (Knight G. & Noyes J., 1999a).

Purpose of the Study

My study consisted of designing a classroom that will promote positive behavioral engagement (i.e. – on-task behavior) and reduce anxiety. While it is important to note that behavioral engagement and anxiety will be the variables measured, this study also hoped to reduce environmental triggers that prevent students from being successful so that they might develop the necessary skills to become self-sufficient students. This classroom will utilize the above mentioned modifications (i.e.-appropriate furniture, seat arrangement, color, and the use of plants) in order to attend to the emotional, physical, and learning needs of students.
The research questions that will guide my study are:

- Does changing the physical environment of the classroom improve the behavioral engagement (on-task behavior) of 9th and 12th grade students?
- Do environmental changes decrease student anxiety in the classroom?

Site and Student Sample

College Ready High School was chosen because of its location and its commitment to innovation and students. While the demographics of the school are typical to an urban high school in Los Angeles, (i.e. low-income, at-risk, and minority) the school itself is relatively new. Classrooms are clean, well equipped with technology, and adequate in size. There is a uniformity in terms of institutional design and aesthetics that the students experience on a daily basis: white walls, tables and chairs, and varying degrees of academic paraphernalia on the walls. The newness of the school is important because it will help subdue the novelty of a re-designed classroom. This school was also chosen because I was a teacher at this school, so I had greater access to resources, supplies, and choice of participants.

Research Design and Data Collection

This study selected students from both the 9th and 12th grades given the significance of these two grades within the high school experience. This study will utilize an AB multiple baseline design that will include three participants. Each participant was selected and observed in their English class during different periods throughout the day. The study was staggered with the intervention phases being introduced at different times of the study. During baseline and intervention phases, the three students will be observed using interval recordings and a biometric
measure. During intervention phases, the students will be observed in a modified classroom (i.e. seats, color, and plants). Since a multiple baseline design requires that the intervention be staggered, the study required four weeks to be completed.

Public Engagement

After the study is completed, I will share my findings with the faculty, administration, and the school community. Given the study’s positive findings, the school and I can continue conversations on what modifications can be made to all classrooms. I will also share my results with other charter organizations and districts. Also, it is my hope that my study will further the discussions on creating classrooms that are adaptable to all types of learners. More studies are needed on designing classrooms that are more comprehensive in regards to being able to support students with a variety of needs. Behavioral engagement and anxiety are two of many characteristics that prevent students from succeeding, and so studies like this may provide practitioners the tools to individualize the learning experience for all students. It is my hope that other schools will affirm the need to create learning environments that help teachers and students attain an optimal level of performance.
CHAPTER TWO: LITERATURE REVIEW

Introduction

Education is an institution that embodies the core values of society. It is through the experiences that education provides that individuals learn to navigate various settings: professional, social, and emotional. Of course, one metric that is used to directly gauge whether a school is effective is through examining student achievement. Other indirect measures such as attendance, student behavior, and feeling positive about school are also used to gauge student success. While these measures are not as concrete or high stakes, they are predictors of student outcomes. Specifically, minorities and at-risk students are the students who typically have difficulty in meeting these expectations. In a time of high stakes testing and standards, the U.S. government has recognized that in order to maintain our competitive edge, the American education system needs to support all students, particularly those who have been historically disadvantaged. The use of classroom design can positively influence these indirect outcomes (Duke & Design, 1998). Schools can provide students the opportunities to develop their intellectual as well as their social-emotional capacities (Roeser, Midgley, & Urdan, 1996) through creating classroom environments that are positive, nurturing, and support the learning modalities of students.

While typically the physical classroom is looked at in terms of precise measurement (height and dimensions), the classroom environment is also experienced and perceived. Student success not only requires quality teachers and relevant curricula, but also a variety of strategies to attend to the various modalities of learners (Duke & Design, 1998). Research has shown that classroom design can have an effect on the teacher-student relationship, safety, and student performance (Kasser, 2007; Knight G. & Noyes J., 1999b; Rosenfield et al., 1985; Umeda &
Deitz, 2011; Weinstein, 1979; Wingrat & Exner, 2005b). When the physical environment of the classroom is experienced, meaning that students feel comfortable, safe and that the classroom meets their learning needs, then students are able to shift to action and become more engaged. When students perceive the physical environment positively, then meaning and significance may be the result (Garling & Evans, 1992). This literature review aims to explore how the physical design of the classroom can support student performance and student feelings about school. The focus areas for this literature review are students’ most at-risk, behavioral engagement, fear and student outcomes, and the effects of classroom design.

The Education of Low-Income Minority Students

To better understand why classroom design can be a highly beneficial tool to aid in academic success, I have decided to begin with an overview on the performance of minority students. They are often the students who are most at-risk and will provide the necessary lens to understand why improving the classroom environment is not only advantageous to student learning, but a matter of equity.

Hispanics’ underachievement is often connected to their immigrant background (Garcia & Jensen, 2007), a background with variation consisting of societal strengths and, often, academic weaknesses. Garcia & Jensen add that immigrant children, as a whole, tend to avoid complications in life, have fewer physical ailments, do not engage in early sexual intercourse, and are less likely to succumb to substance abuse. Although minority children have positive qualities that enable them to avoid negative incidents in their overall life, immigrant children must combat obstacles that do not allow them to attain academic success. Approximately 80% of students who are English language learners are Hispanic children. Interesting to note is that 85%
of Hispanic children are born in the United States so this lack of proficiency is not directly connected to a student’s immigrant status and his/her assimilation into American society. Why, in the case of Latinos, are U.S. born children and immigrant children struggling with the same educational issues (Garcia & Jensen, 2007)?

According to Martinez (2009), Mexican-Americans are the least educated ethnic group in the United States, and this has been attributed to low educational expectations, lack of access to money and pertinent information, and the mismatch between their home and school environment. Research has shown that Mexican American students are more likely to feel disengaged in the classroom as compared to other racial/ethnic groups because they feel education is unpleasant and nonproductive (Martinez, 2009). Reardon & Galindo (2006) state this lack of engagement has resulted in White and Asian students outperforming Hispanic students at all proficiency levels in reading and math throughout their schooling. Some researchers have argued that Hispanics’ performance must then be linked to class because Hispanics have a lower socioeconomic status (SES) as compared to Whites and Asians; however, a study of kindergarten students (Reardon & Galindo, 2006) revealed that in all five SES quintiles, Hispanics performed lower in math and reading; this suggests that poverty may not be at the root of minority underachievement.

One study suggests that Hispanic underperformance, both immigrant and non-immigrant, may be connected to acculturation strains or pressures in the school setting (Vega, Khoury, Gil, & Warheit, 1995). Immigrant students have low acculturation and struggle with fast language and cultural transitions while Hispanics that have been highly acculturated tend to internalize their minority status and accept prejudicial perceptions. Acculturation strains negatively affect both types of Hispanic students and result in problematic behavior and negative academic
outcomes. In another study, it was found that as the proportion of students with middle or high-income parents increased, students who were low income experienced more psychosocial problems, measured as varying degrees of self-esteem (Crosnoe, 2009). This study seems to be complementary to the Vega et al. study in that perceptions of self seem to have a notable effect on academic performance. These studies support the notion of an opportunity gap in that what is being examined is a student’s experience in school rather than a projected academic outcome (Flores, 2007). If studies are able to identify the experiential disparities of students rather than identifying deficits, educational institutions might be better able to support students through the K-16 pipeline.

Underachieving Minority Students

One factor that has not been researched extensively is how minority students perceive themselves and how emotions affect their performance in school (Martinez, 2009). Martinez engaged in a five-year study of approximately 1,000 students from grades 6-12 and examined the perception students from various race/ethnicities had of school. The study revealed that Mexican American students were more likely to be less engaged during lectures as compared to Black, Asian, and White students. Also, as compared to other groups, Mexican American students experienced the highest level of challenge in school, and this level of challenge did not diminish when in other settings. If the setting is work, the mall or a friend’s house, the level of challenge is consistent for Mexican American students where other groups showed an increase in challenge from non-academic settings to school. If the setting was home, Mexican American students’ level of challenge decreased significantly as compared to other groups. The implication seems to be that Hispanic students have difficulty assimilating to the mainstream suggesting that Hispanic
students do not perceive themselves as having the ability to be successful in settings outside the home or that these settings have not created environments where Hispanic students are able to build upon their strengths.

Another factor that places both Blacks and Hispanics at a disadvantage is cultural discontinuity. This concept is defined as “a school-based behavioral process where the cultural value-based learning preferences and practices of many ethnic minority students—those typically originating from home or parental socialization activities—are discontinued at school” (Tyler et al., 2008, p.281). Essentially, students’ culture provides the means by which they engage in cognitive tasks, so as minority students enter school, they are forced to choose whether their cultural process for deciphering and acquiring knowledge should be replaced with the cognitive processes modeled at school. Cultural discontinuity suggests that schools are not recognizing student learned behaviors from home such as Black children’s tendency to call out answers or be constantly moving, (Tyler et al., 2008), and this disconnect may be why students are not learning. Schools are not tailoring or adapting to the needs of their diverse population; rather schools have created a system that services a homogenous group. In essence, one could argue that our current education system is not set up for success for those who do not conform to the status quo.

In examining the literature on Hispanic students, it has become evident that environment, perception, race, and culture all seem to be factors that impede minority students’ success in school (Gay, 2002; Ladson-Billings, 1995b; Tyler et al., 2008; Young, 2010). In spite of these factors, all students need “literacy, numeracy, technological, social and political skills in order to be active participants in a democracy” (Ladson-Billings, 1995a). However, there are many
obstacles that minority students must overcome in order to be successful in school; two major factors are behavioral engagement and a student’s feelings towards school.

Behavioral Engagement

Adolescence is a time a time of transition for students: behaviorally, cognitively, and emotionally. During this time, a majority of students suffer a significant decline in engagement and motivation (Eccles et al., 1993; Janosz, Archambault, Morizot, & Pagani, 2008). In addition, students must deal with other external factors that may affect academic and personal well-being. For over thirty years, behavioral engagement has been studied as a predictor of academic outcomes for students (Brophy & Good, 1984; Fredricks, Blumenfeld, & Paris, 2004). Furthermore, behavioral engagement has become a national issue among policy makers and educators as they strive to improve the academic progress of students (Downer, 2007). Archambault, Janosz, Morizot, & Pagani (2009) have determined that there are two dimensions to behavioral engagement: cognitive and affective. The cognitive dimension involves the psychological process of learning (e.g., meaningful engagement, being on-task, and perceptions of competency). The affective dimension refers to students’ feelings, sense of belonging, and perception towards their school experience. Primarily, this dimension focuses on whether a student likes school and a student’s sense of belonging. For the purpose of this study, behavioral engagement will be examined through the lenses of on and off-task behavior and feelings towards school.

M. L. Roberts, Marshall, Nelson, & Albers (2001) conducted a study whose goal was to identify the antecedents that triggered off-task behavior. Three students were observed during mathematics class, and the results were fairly consistent across all students. During academic
activities, the students were not on task, on average, for 67% of the time as compared to only being off task, on average, for 15% of non-academic activities. Furthermore, it was noted that students proceeded to engage in off-task behavior in order to escape difficult work, ranging from 71-88% of the time. During a second phase of the study, the authors manipulated instruction and frustration levels, and increases in off-task behavior were displayed by all three students. In a similar study, Gambrell, Wilson, & Gantt (1981) explored the relationship between reading proficiency and task attending behaviors. Good readers were on task more than students who were poor readers, the implication being that student reading proficiency is related to reading achievement. Good readers spent 57% more time on contextual reading, the skill of using context clues to gather meaning, than poor readers (33%). This statistic identifies the difference between being a critical reader as compared to a student who is only reading for basic comprehension. Furthermore, only 36% of good readers spent any time on listening, speaking, and writing (non-reading activities) as opposed to 54% of poor readers who engaged in these activities. This suggests that good readers are more independent and self-sufficient while poor readers tend to rely on non-reading activities to access content.

In both studies, when content is difficult students are quick to avoid or engage material that highlights or identifies their deficits. A student in an academically difficult situation is relegated to engage in off-task behavior because there are few supports to aid the student. Academic activities necessitate students to be fully engaged; however, if students lack the skills necessary to remain engaged then it becomes difficult for the student to make academic progress. Teachers need strategies that limit off-task behavior, particularly strategies that may minimize the anxiety of not meeting teacher expectations. It is important to create classroom environments that support students who are easily distracted and who have academic deficits. A teacher can
only support so many students in any given time, and so it would be beneficial to create class environments with the aim of supporting students to remain on task.

Research has determined that a student’s sense of belonging can bolster motivation and academic success (Ryan, Stiller, & Lynch, 1994; Skinner & Wellborn, 1994). Faircloth & Hamm (2005) studied four ethnic groups in relation to a student’s sense of belonging. This study specifically examined the teacher-student relationship, involvement with peers, engagement in school activities, and perceived instances of discrimination (Osterman, 2000). It was found that students could improve their connectivity to school through any of these four domains. All ethnic groups valued relationships with teachers and activities that immersed them in the school culture. Students need to feel they belong to a school because it is a major factor in student achievement (Osterman, 2000); however, there are other factors that may impede success like fear and anxiety, a subset of a student’s feelings towards school.

**Fear and Student Outcomes**

Researchers argue that the perception of danger is more important than the reality of danger that students may face (Astor, Benbenishty, Zeira, & Vinokur, 2002; Gottfredson, Gottfredson, Payne, & Gottfredson, 2005; Kitsantas, Ware, & Martinez-Arias, 2004). In fact, most researchers understand that feelings of safety are complex, and by minimizing safety as solely an issue of violence does not take into account the reality of student experiences (Bosworth, Ford, & Hernandaz, 2011). Astor, Benbenishty, Zeira, & Vinokur (2002) conducted a study of 3,518 Israeli high school students. The goal of the study was to examine how external and internal violence affect students. This study reported that 10% of students were involved in a physical fight over the previous school year. Nearly 6% of students reported that they did not
attend school over a 30-day period because they were afraid, and 6% also reported carrying a weapon over the same period of time. Lastly, 27% of students reported that property had been stolen from them while at school. These facts reveal that the school environment can be a place where a student feels vulnerable and unsafe. Whether the percentage is 6% or 27%, it is important to recognize that any of these incidents may prevent a student from fully engaging in class work or in the school community.

Bosworth et al. (2011) conducted a study that focused on the perceived characteristics of a safe school. Through the use of focus groups, researchers identified three categories students and teachers all named: physical characteristics and safety features (i.e. - security cameras, fences, etc.), organization and school discipline (features that create orderly environment), and school staffing (feelings of safety promoted by a sense of caring and community). Students stated that keeping the school perimeter secure was important while teachers did not. Students felt safer in smaller school settings. Another significant finding was that students felt that school climate in regards to rules, fear, and staffing was important in determining a student’s feeling of safety. While it is obviously important to ensure the physical safety of students, the study revealed that the physical characteristics of the school also translated into an emotional state of well being or lack thereof for students. In regards to organization and discipline, Bosworth et al. also found that students preferred when faculty and staff enforced rules. Students wanted teachers to stop fights and make students accountable because accountability helped ensure their safety. Students indicated their desire to feel safe within the parameters of the school, more so than teachers, a suggestion that students need a safe environment to learn. Lastly, Bosworth et al. found that students really appreciated teachers who were visible, positive, and who helped create a caring environment. The findings in this study further validate that while teachers are
essential for students feeling safe and connected, the physical environment seems to be equally important. Students clearly did not want to feel vulnerable and needed to feel both physically and emotionally safe.

Hanish & Guerra (2002) conducted a two-year longitudinal study focusing on the effects of peer victimization (being picked on by another student) on student’s behavioral, social, emotional, and academic functioning. They assessed an ethnically diverse sample of first, second, and fourth graders allowing outcomes to be measured across various groups. There were 2,064 students spanning from first to fourth grade. The ethnic distribution was as follows: 40% Hispanic, 38% African American, and 17% non-Hispanic White with 50% boys and 50% girls. Two years later, 71% of the students were reassessed. The results of this study revealed there was an association between past instances of victimization and internal and external behaviors of students: internal behaviors are anxiety, depression, and social withdrawal while external behaviors are aggression, inattention, and delinquency. Findings demonstrated that boys and girls had increases in levels of anxiety and depression post victimization although boys had a tendency to experience higher rates of anxiety and depression. During the second year of the study, Hanish & Guerra collected data again and found that students who displayed external behaviors demonstrated an increase in aggression, lack of attention and delinquency. Also, these students had increases in anxiety, depression and had a significant decline in math achievement. Those who were given an internalizing designation increased in anxiety, depression, withdrawal, and had a decreased popularity. Whether the student demonstrated external or internal behaviors as a result of peer victimization, the findings in this study demonstrate the profound effect victimization has on students. Fear seems to affect all facets of the whole child. It is also important to focus on the fact that anxiety, withdrawal, and lack of attentiveness increased over
time as a result of being a victim. Schools and educators need to take note, particularly those who work in urban schools or with at-risk students, because the implication is that students who are consistently exposed to violence or settings that threaten one’s safety will likely endure long term effects.

School environments that are chaotic can result in student misbehavior, not completing tasks, and anxiety (Aleem et al., 1993; Dinkes, 2009). While the teacher role, including the teacher-student relationship, is undoubtedly important to a student’s success, teachers who are immersed in the work of servicing at-risk students can become emotionally strained, have decreased feelings of commitment, and feel a lack of self-efficacy. Ultimately, these feelings may result in teachers not wanting to engage in positive relationships with students (Brouwers & Tomic, 2000). This research points to the classroom as the backdrop key to both student and teacher contentment (Bosworth et al., 2011).

*The Effects of Classroom Design*

Studies have shown that students are acutely aware of their environment and seem to know what supports their modality of learning. Ahrentzen & Evans (1984) conducted a study examining how the classroom environment affected distraction and privacy. Sixty-five students from grades four through six were interviewed and asked questions that ranged from the physical dimensions of the classroom and privacy amenities such as desk type. In examining the structural walls of the classroom, students were distracted when noise penetrated through the walls. When students were asked about privacy, 68% responded that they wanted a secluded area to study. This desire to be secluded is verified by the fact that students did not respond positively to classrooms that utilized an open classroom design. Both these results possibly imply that the
students did not want to be in spaces that allowed them to be vulnerable. Also, these spatial issues could be connected to feelings of safety. Whatever the cause, students seem to understand what aspects of the classroom physical design are beneficial to their learning.

**Seating**

According to Knight & Noyes (1999), students should be given more choice in seating and better guidance should be given to those who work with students “in order to inform their decision-making about classroom furniture and the postural, anthropometric, and orthopaedic aspects of sitting and related activities (p.747). Wannarka & Ruhl (2008) examined multiple studies that measured the effects of seating arrangement on student behavior; and overwhelmingly, these studies showed that rows rather than tables had the greatest impact on student participation and on-task behavior. Regardless of the age group, ability of student, and whether the student had been labeled as disruptive, rows had a positive impact on students when working on individual tasks. Rosenfield et al. (1985) examined three seating arrangement styles: circles, rows, and clusters. In whole group activities, circles and clusters produced more on-task behaviors than rows. Rows produced more withdrawal and off-task responses than circles or clusters. Rosenfield also examined different student types such as low achieving boys and girls. Low achieving boys tended to engage in more disruptive behavior, off-task behavior and withdrawal than low achieving girls. Rosenfeld suggest using a circle design because not only did it increase on-task behavior and participation, but the teacher-student discussion, although to some unruly, pertained to the specific classroom activity. This study affirms the effect that specific classroom design can have on student performance.
The classroom is a multi-functional sensory-rich environment that can present students with daily challenges to complete academic activities and procedures (Umeda & Deitz, 2011). A teacher’s ability to be a strong classroom manager is typically the intervention used to increase engagement, attention, and appropriate behavior, particularly for students with learning disabilities. However, sensory issues may be at the core of why a student’s behavior is not appropriate for the classroom. A lack of knowledge is what usually prevents a practitioner from utilizing sensory-based strategies (Schilling & Schwartz, 2004; Umeda & Deitz, 2011).

Schilling & Schwartz (2004) conducted a study utilizing therapy balls as a sensory-based intervention to increase engagement and in-seat behavior. Therapy balls provide students the opportunity to move and to maintain an optimal posture and arousal level; they have been used extensively in Europe to ensure back health (Illi, 1994; Schilling & Schwartz, 2004). This study focused on students with Autism Spectrum Disorder (ASD) because the authors wanted to help students with ASD to attain an optimal state of arousal in the classroom. Schilling & Schwartz utilized a single subject design and four participants. During baseline phases, students sat in standard chairs, and during intervention phases students sat on therapy balls. For three of the participants, the results were immediate and substantial although all students improved in their in-class behavior. When the intervention was removed, the participants’ performance declined and returned to baseline levels. Studies have shown that optimal seats are those that are proportional to an individual’s height in order to eliminate strain on the back and allow students to focus on the task at hand (Knight G. & Noyes J., 1999b). While this study was conducted on students with ASD, the results are clear in that therapy balls markedly improved in-class behavior, ensured optimal arousal levels, and allowed students to adjust their height in relation to
Color and Plants

The use of color and plants are two ways that schools can help students be calm, focused, and ready to engage in classroom activities (Dinsmore, n.d.; Han, 2009; Johnson & Maki, 2009; Stephenson, n.d.). Studies have shown that light colors such as blue and purple have a calming effect on students with behavioral challenges or where tension is frequent. Colors such as taupe and peach allow students to focus on their studies and stimulate creativity (Dinsmore, n.d.). Different colors should be used for different spaces in a school in order to elicit specific results. If the aim is to create a quiet space to study, then soft colors such as pale blue or gray should be used. If the goal is to create excitement, then red is an ideal color for the gym, but only as an accent color because it can also promote aggression (Stephenson, n.d.). The classroom requires a combination of colors. Specifically, is it suggested that the wall behind the teacher should be bright (blue or green) in order to stimulate children to look towards the front. The other three walls should be painted quiet colors such as pale yellow, blue, or green. This will reduce eye strain and promote students to be on task (Johnson & Maki, 2009b; Stephenson, n.d.). Since transition time between periods is usually short, it is suggested that hallways should be painted bright colors, school colors would be ideal. This motivates students to move quickly through hallways and prevents students from dawdling (Stephenson, n.d.). In a study conducted in a university setting, the goal was to see whether color affected off-task behavior, emotions, and students’ willingness to learn. Two college classrooms (one control and one test) were utilized, and data were collected pre and post the change of the classroom color. After the classroom was
painted, there was an observed difference in attentiveness as compared to the control group. Also, the paint reduced glare and appeared to help the students focus. While grades did not differ between the control and test group, it is important to note that as all grades decreased over the course of the semester, test group grades did not decline as much (Johnson & Maki, 2009b).

There are various studies that have shown the benefits of plants on health and well-being, but there is limited research on the effects of indoor plants on students. One benefit of indoor plants is that they can improve indoor air quality because they can reduce CO₂ levels (Daly, Burchett, & Torpy, 2010). There have been some studies that utilized plants as a means to improve work performance in the office (Bringslimark, Hartig, & Patil, 2007; Lohr, Pearson-Mims, & Goodwin, 1996). One study in particular was able to reduce stress, anxiety and low morale by 30-to 60% in the office space (Dijkstra, Pieterse, & Pruyn, 2008). In a study conducted at three different schools, various plants were placed in the classroom in hopes of improving student performance (Daly et al., 2010). In two of the three schools (schools labeled A, B, & C), there were improvements in spelling and math in classrooms with plants as compared to those with no plants. The improvements ranged from 10-14%. In school B, there were also improvements in science and math as compared to classrooms with no indoor plants. There was agreement among teachers and students that not only did indoor plants improve student scores, but also they improved the aesthetic appeal of the classroom (Daly et al., 2010). The use of plants, like color, is another strategy to support student learning, emotion, and overall well-being.
**Conclusion**

Minorities, at-risk and learning disabled students must endure many factors that may affect the trajectory of their learning. Currently, most schools have not invested in creating classrooms that support the needs of students even though the research is clear that students are affected by the learning environment. Indicators such as behavioral engagement and feelings of safety can contribute to a student’s lack of success as a whole child: academically, socially and emotionally. It is odd that there seems to be a common acceptance that minorities and at-risk students can often come from physically, emotionally, and psychologically dysfunctional environments, and yet schools fail to recognize that classrooms often reflect the world these students come from. Classroom design has been a topic of interest for many years, but most schools do not make it a priority, which seems to signify an unwillingness to serve those who need a truly comprehensive and compassionate school.
Chapter Three: Research Design

Introduction

As discussed in the previous chapters, one of the most important issues concerning educators today is the retention and graduation of high school students (Finn, 1989; Lee & Burkam, 2003). There are many studies that examine why students drop out, and the value of the teacher and the relationship he or she develops with students, but these same studies tend to undervalue—or overlook—the use of the physical space of the classroom as a preventative measure even though there is consensus that environment can effect student behavior and performance (Davis & Fox, 1999; Denti & Guerin, 1999; Reschly, 2009; Wingrat & Exner, 2005a). While there are numerous studies on single modifications to classroom design, there is limited research on multiple modifications of classroom design with the aim to support general education classrooms that can have a variety of learners.

The purpose of this study was to design a classroom that will improve a student’s behavioral engagement (i.e. a student’s on-task behavior), and reduce anxiety. My intent was to design a classroom that not only attends to the various modalities of learning, but also attends to the emotional needs of students who come from harsh environments, so that they are able to redirect their energy towards learning.

This study will address the following two research questions:

- Does changing the physical environment of the classroom improve the behavioral engagement (on-task behavior) of high school students (9 and 12th)?
- Do environmental changes decrease student anxiety in the classroom?
Research Design

An AB multiple baseline design was used so that inferences could be drawn from comparing the performance of individuals across baselines. The effects of the intervention will be demonstrated through comparing students with similar behaviors across baselines. If a change occurs in the baseline when the intervention is introduced, then “the effects can be attributed to the intervention rather than extraneous events” (Kazdin, 2011, p.144). This method was chosen because it provides a convincing demonstration of causality for those who conduct applied research. Each time the intervention is introduced it is similar to conducting an individualized experiment because if the results demonstrate a change during the intervention then the data is suggesting that the intervention was responsible for the change, not an extraneous factor (Kazdin, 2011). This method allows for causality and flexibility while creating parameters that increase validity. The characteristics of this design are complimentary and supportive of the needs of this study and its participants—ninth and twelfth grade students.

Site and Population

This study took place in a small urban charter high school in the Los Angeles area that is housed on a large district campus. This school was selected on the basis of (a) location: this school is located in a low-income neighborhood (b) high proportion of students who are low skilled and/or at-risk (c) school reputation as a place of innovative practices whose goal is have all students be college-bound. This school has students that are mostly low income and are primarily Latino. While the high school is in an historically impoverished neighborhood, the facility is relatively new. The high school is in its third year of operation and is fairly modern in terms of aesthetics and technology. The high school is comprised of grades 9-12 where, on
average, 50% of students are not proficient in math or English according to state assessments. As a result, 75% of ninth grade students have been placed into math and English remediation courses. Also, like most high schools, this school must also attend to issues of attendance, family life, social/psychological well-being, and behavioral issues, all of which can prevent a student from being on-task and/or completing high school. Given the demographics and patterns of learning, this school site proved helpful for the study in terms of selecting participants with specific learning modalities and behavioral issues. Specifically, this school allowed me the flexibility needed to conduct this type of study because, ultimately, this school would like to benefit from this study’s findings in order to better serve its students.

The population was ninth and twelfth grade students who have similar characteristics in regards to behavioral engagement (on-task behavior) and anxiety. Faculty was asked to choose students based on classroom observations and through utilizing a CBCL behavior checklist that identifies attention problems, withdrawal, and anxiety. While my study aimed to help all students, it was specifically geared towards students who are at-risk, and so the population I chose would hopefully benefit most from the success of this study.

*Participants*

The study focused on two 12th grade students and one 9th grade student. These students were observed in three different periods of the same teacher. The study examined behavioral engagement and student anxiety in relation to the physical design of the classroom. I worked with the ninth and twelfth grade faculty to identify three participants who are currently enrolled at the school. Students who were chosen have demonstrated functional challenges with on-task behavior and anxiety. Beyond teacher recommendation, I used the Child Behavior Checklist
(CBCL) to confirm if the referred students displayed the above stated characteristics. The CBCL is a psychiatric assessment tool used to rate behaviors such as depression, anxiety, and attention problems. It utilizes a Likert scale from one to five. It is an empirically based assessment created by the ASEBA foundation, and has been used for over forty years. Only three students were observed for on-task behavior and measured for anxiety and were asked to sign consent forms with parental consent.

While utilizing a traditional single subject design allows for using one participant, I chose to use three participants in a multiple baseline study because it increases validity through increasing the number of participants, allowing multiple students to be observed. I chose ninth and twelfth grade because it is the entry and exit point of high school. This study aimed to prevent students from feeling disconnected, uncomfortable, and ultimately from withdrawing from school activities or school in general.

**Procedures**

*Pre-baseline Activities*

Given that the yoga ball chairs were donated, the school decided to incorporate the chairs into their curriculum to support learning. As a result, I was able to have all classes involved with the study be exposed to the yoga ball chairs (Gaiam® Balance Ball Chair) prior to the commencement of the study. This was important because it allowed me to remove the novelty of having new seats. It seemed reasonable to believe that anything new would promote a positive behavior or outcome so it was imperative that these feelings of excitement towards using the yoga ball chairs were diminished as not to bias the findings of the study. Also, based on previous
literature on yoga balls chairs, it was important that I had time to adjust the diameter of the ball so that each student could sit comfortably in relation to the desk.

As the principal investigator, I explained the study to all classes and let them know that the study focused on changing the classroom environment. Students were informed that only one student from each period would be selected for the study. The first three students to return the forms were screened for inclusionary and exclusionary criteria. Once students met criteria, they were selected for the study. In addition, all students signed consent forms to be filmed as a requirement of attending the school because the school deems itself a learning lab.

**Baseline and Withdrawal Phases**

Two classrooms, a traditional class (non-modified classroom) and a modified classroom were used during the study. The teacher began the study in the traditional classroom with all periods. Once a baseline was established for participant one, the teacher moved the participant and his entire class period to the modified classroom. Data was collected on participant one until there was consistency for the observed behavior. The other periods of the teacher remained in the traditional classroom. Once there was consistent data on participant one in the modified classroom, the teacher moved participant two and his entire class period to the modified classroom. Again, data was collected on participant two in the modified classroom. Also, data continued to be collected for the other two participants in the traditional classroom. This process continued until all participants and their class periods were moved into the modified classroom. The interchange of phases for each of the three participants continued until all phases were completed. The duration of each phase varied, but the study was completed in less than four weeks. While all students experienced the amenities of the modified classroom, only the selected
students were observed. Only students who signed assent/consent forms and who met criteria to participate were observed on the yoga ball chairs while all other students used the yoga ball chairs as part of the school curriculum.

**Participant #1**

![Graph](35.png)

**Participant #2**

![Graph](36.png)
The independent variable in this study was the modified classroom that the teacher used. The modified classroom incorporated the following three modifications. *Therapy ball.* Each student sat on yoga ball chairs in lieu of a standard chair. *Color.* Three walls of the classroom remained white but the front wall was painted blue-gray. *Plants.* Plants of varying heights and sizes were used and placed throughout the classroom.

### Dependent variables

*On-task behavior.* On-task behavior was defined as “engagement in the appropriate classroom activity and [was] demonstrated by visual orientation toward the appropriate classroom activity, appropriate manipulation of materials related to the activity, or appropriate
interaction with the teacher, including visual attention to the teacher’s verbalization” (Umeda & Deitz, 2011, p.154). A duration assessment was used to measure the length of the participants’ on-task responses. A stopwatch was used to note the beginning and end of the response. Criteria to define the onset and termination of the response was clearly defined in order to gain consistent data (Kazdin, 2011).

**Anxiety.** Anxiety was defined as worrying or obsessing about small or large concerns that may cause shortness of breath or rapid heartbeat. The EmWave, a device that measures heart rate and pulse, was used to measure participant anxiety. An average heart rate was determined by using the American Heart Association guidelines. An elevated heart rate was determined through utilizing the guidelines set by the American Heart Association according to age and fitness level. The EmWave was used on each participant prior to the beginning of each class and immediately after each throughout both stages: baseline and intervention.

**Access**

Being an employee of the school, I have an established relationship with my colleagues and administrators that allowed me access to information, space, and flexibility to conduct my study. Since the charter school is small, there is no established protocol for requesting to conduct research. Given the lack of protocol, I asked permission to conduct my study from the head of school. In addition, I provided a letter that outlined my study and provided details of the participants involved. The principal was asked to sign a letter of participation. Since the classroom I used is my own, I had complete control over the setup and consistency of the classroom design. In regards to gaining access to the participants, I have an established relationship with the participants given that they are my students; however, I drew on the opinions of my colleagues and the CBCL checklist to select and ensure that the participants
would be able to endure the study process. Parents and students were asked to sign consent forms.

I presented myself as a graduate research student, but I capitalized on my role as a teacher. As a graduate research student, I made sure teachers, students, and parents understood that I would conduct my study ethically while maintaining the standards of research. As a fellow teacher, I used my relationship with my colleagues to assure them that the study would absolutely be limited to observing the participants. I saw no significant challenge in regards to working with administrators and staff given the focus of this study.

Data Collection Methods

Data was collected via interval recordings. Interval recordings, a frequent strategy of measuring behavior, allowed the researcher to score students in an applied setting (Kazdin, 2011). Each of the three students was individually observed indirectly (via taped video recording) during three different sections of the day during each phase (baseline and intervention) for a 20-minute observational period four times a week per condition. The observer, a teacher volunteer from another site, watched a 20-minute session of structured class time, and using a stopwatch, the observer marked every 60 seconds whether the child was on or off task. Thus a total of 20 intervals were collected for each observation. Approximately 25% of the sessions will be double coded by another observer in order to rate inter-rater reliability. Since I was measuring on-task behavior, a component of behavioral engagement, the hope was that there would be an increase in on-task behavior during the intervention phase. Prior to beginning the study, reliability was achieved between two observers on the rating of on-task behavior at 80% on pilot cases, not participants in the actual study. In order to maintain accuracy
of data collection, an interobserver agreement was assessed throughout the study. Taped observations were used and agreement was reached when both observers reached 80% consistency on measuring on-task behavior. Agreement and disagreement were calculated by dividing the number of agreements by the total number of observations.

A biometric assessment will be used to measure student anxiety. I used a device known as the EmWave that measures pulse and heart rate. I measured each of the three students individually in each classroom setting during each phase: baseline and intervention. Each participant placed a clip on his ear, and the EmWave took a reading of the participant’s heart rate pre and post each session. Other assessments such as self-reporting could cause validity issues because a participant might insert personal biases or might not be adequately trained to assess (Kazdin, 2011). Through measuring the heart rate of each participant, validity increased because measuring a biological response provided data that is more credible as opposed to using other measures such as survey or interview that are subjective.

Questionnaire. Students were given a pre and post survey before and after the study. The questionnaire included questions about academic performance, comfort at school, stress levels, classroom environment, and on-task behavior. Although only three students were observed during the study, all students in each class period observed were given this pre/post questionnaire to provide additional qualitative data about their experience in the classroom.

Data Analysis

Observation data for each individual was plotted using line graphs. Each data point represents the percentage of 60-second intervals in which on-task behavior was observed for one
20-minute session. Each participant’s data was graphed separately and visual inspection of each graph allowed me to note any changes in level, trend, or variability from baseline to intervention phase. In particular I calculated the percent of overlapping data between phases to assess independence of conditions and calculating stability or change in trend of the data.

Data collected via the Emwave were graphed daily. There were two data points for each session to represent the participant’s heart rate prior and after each observation session. Given that the data is a biometric measure, I simply examined each participant’s daily heart rate and compared it to the accepted resting heart rate.

I analyzed the questionnaire by tallying the responses from each question and generated percentages that reflect the students’ responses. I was careful to note any patterns of similarities and/or differences, and I compared this data to the data collected from the multiple baseline study and the data collected from the Emwave.

**Ethical Issues**

There are two ethical issues that are prevalent when utilizing a multiple baseline design. First, there are ethical issues when an intervention is removed from a participant, particularly when the intervention has dramatic effects. Of course, the goal of any study is to bring about improvement, and so the study may come into question if a treatment is removed from an individual who really needs it (Gast, 2009; Kazdin, 2011). In regards to this study, the participants who were chosen were not in dire need of this treatment; rather, the treatment was meant to provide additional support to both student and teacher. Second, the other issue that can arise is delaying the intervention, which is the basis of the multiple baseline design. The
argument is that it may be unethical to deny immediate treatment to an individual if he or she may benefit from its effects (Gast, 2009; Kazdin, 2011). Again, in regards to this study, the participants chosen were not students who have extreme behavioral deficits; rather, they were individuals who might benefit from the additional support a modified classroom might provide. Also, it is important to note that the entire scope of the study was 3-4 weeks, and every participant was exposed to the intervention in a relatively short time period. I maintained confidentiality of students and all else that I observed in the classroom. All records that I collected have been saved to my computer and secured with a password that only I possess.

Validity and Reliability

The ABAB multiple baseline design, rather than an ABAB single subject design, was specifically chosen to increase validity of the study. A limitation of using a single subject design is that there is only one baseline to measure data, and therefore questions of validity might arise in the form of history—events such as family crises or teacher interactions that might influence results during the intervention phases (Kazdin, 2011). The rationale for an AB multiple baseline was two pronged: 1) The use of multiple baselines allowed me to stagger the implementation of the intervention to demonstrate that the results are not isolated and to limit history validity issues, and 2) the ability to examine one behavior at a time allowed the researcher to test the effectiveness of the procedure before applying the intervention to other participants. The initial effects can be examined, and then modified if necessary (Kazdin, 2011). Other items that were used to ensure reliability was the use of a natural environment, the interrater agreement, and the
use of multiple subject research methods to individually track all participants’ behavioral responses throughout the duration of the study (Umeda & Deitz, 2011).

Summary

So much of the dialogue at schools is about differentiating instruction, and I believe that creating very intentionally designed classrooms is a way of differentiating the physical space to attend to the needs of various types of learners. All stakeholders of schools want the best overall experience for students, and this study provides these stakeholders a better understanding of a resource that is undervalued, but needed to create an optimal learning environment. Ultimately, this study will hopefully give schools another tool to help all students complete a K-12 education.
Chapter Four: Findings

Introduction

This study investigated whether changing the physical environment of the classroom would improve the behavioral engagement (on-task behavior) of 9th and 12th grade students. A second aim was whether changing the physical environment would decrease student anxiety in the classroom. This chapter presents the findings produced by observation, biometric data, and surveys collected from three participants who attend a Los Angeles urban high school.

The chapter presents findings from the above-mentioned data collection methods and is organized by research question. Before presenting the findings, I provide 1) a summary of the pre-treatment and primary findings regarding the participants’ on-task behavior and anxiety levels, and 2) an overview of the visual inspection process.

Summary of Results

This study did meet evidence standards because “the independent variable [was] systematically manipulated with the researcher determining when and how the independent variable changed,” more than one assessor measured the outcomes systematically over time, and there was inter-assessor agreement in each phase. There were three attempts to demonstrate an intervention, and there were a minimum of three data points (Kratochwill et al., 2010, p.16). Pre-intervention data indicated that all three participants had low on-task behavior and varying levels of anxiety. Visual inspection of data suggests that there is a causal relation and positive success as a result of the treatment. The results of the study indicate that all participants displayed increases in their on-task behavior once the intervention phase (modified class) was begun.
Similarly, all participants’ heart rates dropped significantly during the intervention phase of the study. The results for the participants are shown in figs. 1-6. For Anthony, Randy, and Roger the positive changes in on-task behavior were both immediate and substantial. Likewise, the decreases in heart rate were also immediate and sizable suggesting that the participants felt less anxious in the modified classroom. Prior to the intervention, 56% of the classes surveyed believed that classroom environment positively affected their learning, but after the study 81% of students stated that the classroom environment positively affected their learning. Lastly, students surveyed identified one or more modifications to the physical design of the classroom, an affirmation that students want a classroom designed to meet their learning needs.

**Visual Inspection Data Overview**

In single case study designs, visual inspection is used to determine success or failure of an intervention. Several elements are calculated for each graph, including a) level, b) trend, c) variability, d) overlap, e) immediacy of effect and f) consistency of data patterns across similar phases (Kazdin, 2011; Kratochwill et al., 2010). “Level” refers to the mean score for the data within a phase. “Trend” refers to the slope of the best-fitting straight line for the data within a phase, and “variability” refers to the range or standard deviation of data about the best-fitting straight line” (Kratochwill et al., 2010, p.18). “Immediacy of the effect” refers to the change in level of the last and first three data points between phases. “Overlap” refers to the proportion of data that overlaps from one phase of data to another (baseline to intervention) (Kratochwill et al., 2010). Kazdin (2011) states that if non-overlapping data is so stark and that if there is no question that an effect took place then this is known at the “slam bang” effect. Consistency of
data patterns across phases will not be utilized in this study because there is no reversal within this design; therefore, similar patterns cannot be compared. If at least three of the above mentioned criteria are met, then a causal relation can be determined, and an inference can be made that the outcome variable changed as a result of manipulating the independent variable (Kratochwill et al., 2010). In the case of this study, if three of the criteria are met, then it can be determined that the change in on-task behavior and anxiety was a result of manipulating the physical design of the classroom.

Results: On-task Behavior

Of the three participants, Anthony, a 12th grade student, had the lowest on-task behavior rate averaging 15% of the baseline period. Anthony’s off-task behavior most often was a result of him being distracted by others, which prevented him from completing assignments or following instructions. During the intervention phase, Anthony was the participant who displayed the greatest improvement in average on-task behavior (82%). In Fig. 1, there is a drop in level during baseline, but the level increases during intervention with a downward trend. Anthony had 0% non-overlapping data between his baseline and intervention phase, which indicates a “slam bang” effect. Further, the graph demonstrates the immediacy of the effect from baseline to intervention. Anthony’s ability to remain on-task increased dramatically, suggesting that the modification in the classroom helped prevent him from being distracted.
During the baseline period, Randy was on-task for 33% of the classroom period. While his on-task behavior is greater in comparison to Anthony, Randy, a 12th grade student, is clearly a student who has trouble remaining on-task. Randy’s off-task behavior is typically a combination of daydreaming and/or non-compliance. According to Fig. 2, Randy’s improvement in on-task behavior was also significant. He increased from 33% on-average on-task behavior to 80% on-average on-task during the class period. In Fig. 2, there is stability within the baseline given the three descending data points. The baseline is level, but the treatment results in an increase in level with a downward trend in data pattern. There is 0% non-overlapping data between his baseline and intervention phase, displaying an immediate effect. Randy was more engaged during class activities, which resulted in him being able to complete tasks according to directions.

Fig. 1. Percent of intervals Anthony was on-task in classroom during baseline and intervention.
Fig. 2. Percent of intervals Randy was on-task in classroom during baseline and intervention.

Of the three participants, Roger, a 9th grade student, displayed the greatest ability to remain on-task during the class period prior to the intervention. He was on-task, on average, for 54% of the time. In comparison to the other participants this is markedly better, but nevertheless the data indicate that Roger is off-task nearly half the time he is in class. While Roger was sometimes observed to daydream, he more often was non-compliant. He was engaged in non-academic activities that were not aligned with the class activities such as drawing, playing with school supplies or looking at other students. According to Fig. 3, Roger increased his on-task behavior from 54% to 79%, on average, during the class period. There is stability within the baseline demonstrated by the last three descending data points. A downward trend is displayed during baseline but the treatment results in an increase in level and a change in trend. Roger had 75% non-overlapping data between his baseline and intervention. Overall, all three participants displayed at least three criteria of visual analysis, and thus a causal relation has been established.
In examining the data collected from the surveys, approximately 90% in both pre and post survey stated that school was important, data that affirms that urban students want to do well and be successful. In regards to the classroom, the majority of students stated that they believed that the classroom environment had a positive effect on their learning. In the pre-survey, 56% of students stated that classroom environment had varying degrees of positivity on their learning while in the post-survey 81% of students acknowledged that classroom environment was positive to their learning. When asked about whether sitting next to someone affected their learning, 65% (in post survey) stated that sitting next to someone positively affected their learning; however, this is contradicted when asked what is the best way they learn. Only 19% of students stated that they liked working in pairs, and 15% stated they liked working in groups. Based on this data, students may want to sit next to someone they know as a means of comfort, not as a tool or opportunity to complete work. When asked about how they would change the physical design of the classroom to improve their learning, the students responded as follows: 46% chose chairs, 23% the color of walls, 31% lighting, 35% setup of chairs, and 12% chose to
add plants. The majority of students chose the chairs, an acknowledgement that the students believed the yoga ball chairs to be helpful to their learning. Also, it is important to note that the students chose a variety of modifications, confirming the need for a modified classroom. A general classroom has a variety of students and learners, and the data in terms of modifications seem to mirror that variety in preference.

Anxiety in the classroom

To determine if a participant displayed physical signs of anxiety, participants’ daily heart rate was compared to the average resting heart rate determined by the American Heart Association. To determine if the modified classroom affected the participant’s heart rate, the participant’s daily average heart rate needed to be out of the healthy range during baseline and then be within the average heart rate during intervention, or the participant needed to display a decrease in average daily heart rate from baseline to intervention.

Anthony is a student who describes himself as caring about school but also concerned about doing well. Further, he reports that he tends to rely on adults too much, will cheat if necessary, and bites his nails; all of these traits can be characteristic of an individual who is anxious. According to the American Heart Association, the average resting heart rate for a teenager is 70 beats per minute, but ranges from 60-100 (American Heart Association, n.d.). Fig. 4 indicates that during the baseline phase Anthony’s recorded heart rate was higher than average on two of the three days, an indicator of high anxiety. It is important to note that on the days that he had an elevated heart rate, his heart rate increased one day and decreased slightly the other, suggesting that the traditional classroom environment did not have a positive impact on his
anxiety levels. Essentially, he entered the class anxious, and he left the classroom anxious. During the intervention phase, Anthony’s heart rate measured well within the normal range. The participant’s heart rate is measured within the first and last five minutes of the class period, and the data in Fig. 4 shows that Anthony’s heart rate is notably different than his heart rate during the baseline period. When comparing the average heart rate during baseline and intervention, there was a significant change. Anthony’s average heart rate during baseline was approximately 85 beats per minute and 65 beats per minute during intervention where he was exposed to the modified classroom. The evidence seems to suggest that the modified classroom design had a noteworthy impact on Anthony’s anxiety levels.

![Graph](attachment:image.png)

**Fig. 4.** Daily heart rate of Anthony measured at the beginning of the class period and measured at the end of the period.

Randy is a student who considers himself as self-motivated, but he tends to isolate himself from others at school. He describes himself as reflective, but he can have thoughts where he perceives himself in a negative light. According to the CBCL, Randy has moderate levels of anxiety. According to Fig. 5, Randy had a heart rate that fell within the average rate for
teenagers; however, it is important to note that on half of the observed days during the baseline phase his heart rate increased. While the increases were not extremely significant, they may suggest that Randy left the classroom feeling more anxious than when he entered. During the intervention phase, Randy’s heart rate dropped significantly by the end of the class period, ranging from 8-20 points. On average, his heart rate dropped 12.7 points. Given that Randy was in the modified class for each recorded session, the data are suggesting that Randy became less anxious in comparison to the pattern of heart rate displayed during the baseline phase.

![Chart](image)

**Fig. 5.** Daily heart rate of Randy measured at the beginning of the class period and measured at the end of the period.

Roger is a student who considers himself to be average in regards to his academic performance. He stated that he has difficulty paying attention and has difficulty finishing tasks. He describes himself as sometimes nervous and bites his nails. While Roger’s anxiety levels are not as pronounced as the other two participants, he does display characteristics of a student who can be anxious in the classroom. According to Fig. 6, Roger displayed the most variance in terms of his heart rate. During one third of the baseline observation days, Roger’s heart rate increased,
an indication that he was feeling anxious. On the other days, Roger’s heart rate slightly decreased with the exception of one day where his heart rate decreased nine points. Overall, Roger’s pattern indicates that he is an individual that experiences a range of anxiety. During the intervention phase, Roger’s heart rate decreased by the end of the class period. His average heart rate decreased by 11.25 points each day. All three participants experienced a decrease in their heart rate levels during the intervention phase, which substantiates that a modified classroom can help lower anxiety levels.

**Fig. 6.** Daily heart rate of Randy measured at the beginning of the class period and measured at the end of the period.

According to the pre and post surveys of participating classes, students identified various places that created stress in their lives. Pre-survey results indicated that one-third of students believed that their stress levels were bad at home, school, and on their way to school. In post-survey, 25% of students reported that they experienced stress at home and on their way to school, a slight decline; however, only 15% of students reported that they felt bad stress in the
classroom. This statistic suggests that as a whole the classes who were exposed to the modified classroom felt less anxious.

Chapter Four Summary

This chapter explored what effects a modified classroom had on both on-task behavior and anxiety. In regarding research question one, all participants demonstrated a significant gain in on-task behavior. Furthermore, whether the students were in grade twelve or nine, the results were similar suggesting that age and grade of student are less a factor in considering who would benefit from the modifications presented in this study. In examining question two, all participants displayed slight to large decreases in heart rate levels indicating, that anxiety levels are highly variable with some suggestion of decreasing as a result of the aesthetic changes made to the classroom.

While chapter four presents findings from data collection in relation to the research questions, the next chapter utilizes these findings to make an argument as to why classroom design is an important investment for student success. In the next chapter, I will make recommendations to schools who are interested in providing a learning environment that is tailored to the needs of their students. I will also detail the limitations of this study, and discuss implications for future research, concluding with a personal reflection about my experiences and conclusions from this study.
Chapter Five: Discussion

Introduction

The impetus for this study was to provide urban high school teachers with another approach for creating a classroom environment conducive to learning, particularly for those students who are most at risk. Given that the Hispanic population is the largest ethnic group in Los Angeles, but is disproportionately low-income and at-risk academically, this study specifically hoped to help the general education urban classroom with a large Hispanic population. According to the literature, Hispanic students can struggle with school as a result of negative self-perceptions, assimilation to mainstream culture, cultural discontinuity, and environment, all culminating in a negative academic outcome (Gay, 2002; Martinez, 2009; Tyler et al., 2008; Vega et al., 1995). As an urban teacher at an urban school, I know that conversations among teachers can be more slanted towards pointing to student laziness and apathy rather than addressing the above mentioned factors that impede learning; in a sense blaming students for stereotyped characteristics without understanding individual differences in learning styles. We often blame the student rather than something about our teaching, or the environment we set up. However, students surveyed in this study negate this notion of academic apathy because they overwhelmingly stated that school is important to them. Furthermore, to varying degrees, students surveyed stated that they were aware of what positively and negatively affected their educational outcomes. In other words, when we ask students, we find they have a good handle on their own learning style and learning needs.

Ultimately, this study attempted to address and/or challenge various attitudes about student learning. Contrary to status quo thinking, differentiation is not limited to accommodating intellectual needs, but rather differentiation incorporates intellectual, socio-emotional, and
physical accommodations to attend to all learners with positive benefits to the student’s learning. Further, while it is clear that schools are limited in impacting the home life of students, schools can create a classroom environment that not only promotes safety and comfort, but that is functional. Finally, in our current climate of accountability and race-to-the-top mentality, education systems need to be wary of the “band wagon” effect where schools compete to be the first to implement the newest innovation rather than to create an educational system that is personalized to the community it serves. Like all fads and trends that consume society, we are led to believe that there is a one-size fits all approach, but this study hoped to have educators reevaluate their approach to learning. Ultimately, a classroom should be comprised of strategies that are academic, emotional, and physical given the diverse make-up of every classroom particularly in underserved urban schools.

Previous research and the data collected in this study yielded consolidated evidence that classroom design can be a tool to positively impact a student’s educational experience. While there is no debate that best practices, classroom management, and teacher engagement are key to creating a successful classroom environment, modifying the classroom design can be a simple solution with powerful results for students who have difficulty remaining on-task and whose anxiety prevents them from fully engaging in school.

In this concluding chapter, I 1) analyze results, particularly as they relate to literature reviewed in previous sections, 2) detail limitations of this study, 3) provide suggestions to secondary schools, 4) discuss the implications of this research for future studies, and 5) provide my final thoughts as related to this topic of study.
Discussion and Analysis

Behavioral Engagement. Behavioral engagement has been a predictor of academic outcomes for many years (Brophy & Good, 1984; Fredricks et al., 2004). Behavioral engagement was examined through the lens of on-task behavior. When instruction becomes increasingly difficult, students tend to be less on-task (M. L. M. Roberts, 2001). Couple difficult content with other factors, and it becomes quite clear why a classroom teacher may spend more time on classroom management than instruction. This study aimed to reverse this reality of diminished classroom instruction and increase students’ on-task behavior through a modified classroom. The modified classroom in this study was designed to improve on-task behavior and anxiety.

Drawing on the literature, the study intended that the yoga balls would combat off-task behavior and the color of the walls and display of plants would decrease anxiety. While the modifications had specific individual purposes, they also were meant to work in concert, creating an overall positive, calm, and conducive environment to learning.

The findings of this study support the utilization of a modified classroom, particularly the use of the yoga ball chair. The results were quite substantial in that all three participants made significant gains in their on-task behavior. Gender and lack of maturity can be attributed to a student’s lack of efficacy in the classroom, but this is not the case according to the results in this study. Three males of varying ages were able to reach a level of approximately 80% daily on-task behavior in comparison to 50% or less on-task behavior prior to the intervention. Regardless of age or grade, the results indicate that there are students who benefit from a non-standard chair, specifically the yoga ball chair given its design to provide core stimulation and comfort. In the case of this study, these design features provided a non-teacher support to combat off-task behavior. These students were more able to follow instructions, complete assignments, and
prevent themselves from being distracted. Clearly there is a benefit for students who are often off-task if they are placed in a modified classroom, especially beginning in the 9th grade. If students are in environments that encourage engagement via both intellectual and physical means, there is a greater likelihood that they will garner success.

*Anxiety.* The theoretical framework of this study is premised on a biological perspective known as “biological sensitivity to context.” According to this perspective, environmental threats trigger innate responses within humans that urge individuals to be more impulsive and satisfy needs more essential to survival rather than expel energy on activities or goals that are long term and unnecessary to one’s existence (Boyce & Ellis, 2005). When applied to students, this biological perspective suggests that students who feel threatened are more likely to socialize and focus on activities of personal interest because a survival mode has been triggered and results in a desire to be instantly gratified. Educational success and other long term goals are negated because biologically these delayed gratifications do not serve an immediate purpose. Similarly, anxiety which can be caused by environment has a physiological effect on an individual that may result in elevated heart rate, an elevated state of arousal, and may effect cognitive performance (Everhart, 2012). Clearly, environment can affect the way individuals interact and comport themselves, particularly students whose environment is harsh.

The three participants in this study had varying levels of anxiety. Anthony had the most pronounced levels of anxiety in terms of heart rate. While Anthony’s average heart rate for both baseline and intervention phase fell within an average range, there was a 20-point decrease between his baseline and intervention. Randy’s heart rate decreased by 12 points and Roger’s decreased by 11 points in comparison to minimal or no decrease during baseline. While both heart rates during baseline and intervention also fell within the average heart rate of a teenager, it
is notable that Randy and Roger also displayed a decrease in heart rate during the intervention. These findings would have had more weight if these participants displayed heart rates that were over 100, but it was difficult to find participants who were both off-task and highly anxious given the small pool of students. The data indicates that these participants were more likely to be off-task than to have high levels of anxiety. With that said, both their average and daily heart rate did decrease, an indication that the modified classroom had an impact. The data from class surveys during baseline indicated about one third of the students felt that their stress levels were high in class. This is a significant percentage of students when examined through the lens of a classroom teacher because in a class of thirty, 10 students would be stressed and most likely having difficulty concentrating and accessing content. After intervention, only 15% of students surveyed stated they felt high stress in class. Given an individual’s biological response to the environment, it is important to note why and when students become disengaged and disconnected from their education. Education is a goal that seems very unrealistic for many students, particularly for minority students, and environment is one factor that can exacerbate this disconnect. While the data in this study could be considered proof of concept given the small sample size, these data are promising and warrant further investigation.

Limitations

This study had various limitations that I review in this section. I will discuss the duration, design, and sample size of my study, the use of the Em-wave to gather biometric data, and the survey.
1) Duration and Design

I utilized an AB multiple baseline design over the course of nearly four weeks. Due to the short period of time I had to conduct the study, my goal was to gather the minimum three consistent data points necessary for each phase before I moved on to the next phase. Given more time, I would have extended the intervention phase of each participant to demonstrate that the treatment’s effect was stable and enduring. For instance, Randy displayed an increased level with a downward trend during intervention, and it would have been interesting to track whether this decrease would have continued. Another aspect of the design that was limited was the nature of the design itself. I utilized an AB design rather than an ABAB multiple baseline design. While I was able to demonstrate causality through multiple participants and by staggering the implementation of the intervention, my results would have been even stronger if I had been able to reproduce similar results through a second demonstration of the treatment.

Similarly, a sample size of three participants is considered the minimum number for a design of this nature. The data were replicated across all three participants thus demonstrating the minimum number of replications. However, the study could have been strengthened if I had identified and observed groups of students in different classrooms. All classrooms have such a variation of students that exhibit and display various degrees of behavior that there needs to be a more comprehensive study. While this study provides some evidence of how to support students with on-task and anxiety issues, there is definitely a need for a more extensive study.

2) Em-Wave

The Em-wave is a computer program that has the ability to measure levels of anxiety and also to offer strategies to lower anxiety via video games. An ear clip enables the Em-wave
program to measure a person’s heart rate and displays the person’s emotional stability (stress) through a display called Coherence. While the Em-wave was able to accurately measure and record the heart rates of each participant, I realized after the study how much I under-utilized the capabilities of the program. I could have used the Coherence application in addition to the heart rates to measure daily anxiety. The Coherence application reveals stress levels via colors (red, blue, and green) and percentages of stress. The anxiety results within this study are limited given that the participants’ heart rates fell within the average range. The limitation of simply looking at heart rates is that all people experience varying levels of stress regardless of heart rate, and using the Coherence function would have provided another data point that could have helped determine if the modified classroom was having an impact on the anxiety levels of the participants.

3) Survey

The surveys were utilized in this study because I thought it important to gather student perspectives on their general school experience as well as their beliefs about the classroom design. Particularly in a study that is premised on the idea that students should feel comfortable in their environment, it was important to learn how students perceived themselves and their school. However, I see now that the survey questions were limited to elicit information about anxiety, school, and learning preferences. In addition, after completing the study and examining the data, I now realize that the survey was limited in other respects. Many questions began with the “what,” but as I deciphered the data I realized that I also wanted to know the “why.” Why were the students stressed? Why is the classroom affecting them negatively? Why do they think they perform poorly? Had I added a focus group to my qualitative measures, I believe that this
would have enabled me to make a more compelling argument about why students would benefit from a modified classroom environment.

**Recommendations**

*Identification*. In the world of education it is important that we identify the problem before we focus on outcomes. Often teachers and schools realize that something is wrong and so the response is very reactive. This reactive response culminates in a quagmire of strategies, innovations and programs that have little chance of success because they are sinking in a pool of thoughtlessness. Education reform is often a process of compiling one solution on top of another, which often results in failure. In contrast, when a student is thought to have a learning disability, he or she referred for assessment. Once there is agreement and a diagnosis is given, a list of accommodations and modification is generated to support the student. This list is specific to the student and becomes the foundation and toolkit of how a teacher can best serve this student.

This process of an individualized education plan should be extended to all students. It is not to say that all students who go through this process result in success, but there is a thoughtfulness and acknowledgement that changes can always be made. While not perfect, the IEP process does not subscribe to the all-or-nothing mentality. It is fluid and is meant to adapt to the needs of students. This study makes an argument that every classroom is diverse, and it is because of this diversity that as educators we should create classrooms that are tailored to the learning needs of all students. This begins with identification and thinking about individual differences rather than teaching to the group—the norm. Schools need to utilize assessments that determine the learning styles and behaviors of students. Once a learning style has been determined, then a list of academic, emotional, and physical accommodations can be generated.
and used to support all students. This list could follow the student and be adapted to the needs of the student. Ultimately, this is an issue of equity. It is not unreasonable or unrealistic to be able to identify what would best support a student’s learning style. Education needs to move away from a one size fits all mentality. Students are different and deserve to have the tools that will best serve their learning needs.

Resources. The cost of this study was minimal in terms of the modifications that were made to the classroom. The cost to change the color of one wall and the addition of plants was minimal. The yoga ball chairs were the most costly given that I needed 30 chairs for the classroom; the cost was comparable to the cost of a traditional chair. While every student had access to a yoga ball chair, students quickly began to realize what type of seat best suited their needs. Not all students wanted to sit in the yoga ball chair, but there were students who recognized the impact the ball had on their ability to focus. In this study, about one third of each participating class really wanted to use the yoga ball chair daily, a fact suggesting that a school only need to purchase yoga balls chairs for a small section of each class. I know that there are those who believe that classroom design modifications are unnecessary expenditures, but I disagree for various reasons. First, the results garnered in this study, particularly for increased on-task behavior, suggest the possibility of having students on-task for the majority of the class period. This could result in students learning more content, passing classes, and having students who have access to more opportunities. The alternative is maintaining the status quo where students, particularly at-risk students, do not pass classes, are not engaged, and possibly have limited opportunities. In addition, when one takes into account the cost of having students retake classes, paying teachers to teach summer school, using school facilities, it becomes clear that cost is not an issue. Second, beyond the fact that there is an abundance of literature that argues
the benefits of students feeling safe and comfortable in school, this again becomes an issue of equity. When one compares the aesthetic appeal of both inside and out of an urban school in comparison to a middle class or affluent school, it is clear there is a discrepancy. All students deserve an environment that promotes comfort, happiness, and success. The beauty of this study is that not only are the modifications used aesthetically appealing, but also they serve the greater purpose of aiding the learning process.

Implications for Future Research

Classroom design is a topic that requires further study because there is a lack of literature on classroom design for a general education population. This is alarming given what research says about school environment, the effects of anxiety, and a sense of belonging. All these factors have an impact on a student’s academic success, and there is a common thread that runs through all of them--environment. If this study were to be replicated, I would have used an ABAB multiple baseline design. The use of this design would not only have provided more data, particularly during the intervention phases, but the reversal would have allowed for a second demonstration of the intervention to provide stronger evidence of causality. Also, while the goal was to design a more comprehensive classroom that attended to both on-task behavior and anxiety, it is not clear how much each modification had on each outcome variable because the modifications were working in concert. If I had more time and given the flexibility of the ABAB design, I would have begun with one modification during the intervention phase and then added a modification during each subsequent intervention to identify the effects of modifications individually and collectively.
Further, while this study was geared towards serving an urban and minority population, it would beneficial to conduct studies attending to the various subgroups: from struggling to gifted students, athletes, different ethnic groups, and students in various content areas. This study was limited because only two behaviors and one teacher’s classes were observed, and there is clearly a need to gather more data on the various sub-groups.

Lastly, this study only made three modifications to the design of the classroom because of limited resources and because only two outcome variables were being examined: on-task behavior and anxiety. I have made the argument that classrooms are very diverse, but my study only addressed the needs of two behaviors even though a classroom is comprised of much more. There needs to be more research on the individual and collective effects of physical modifications to the classroom such as lighting, seating arrangement, the use of music, and the use of learning stations. It is important that teachers have evidence that sufficiently demonstrates that grouping of various design modifications will help improve the academic outcomes of their diverse classrooms. Ultimately, this study never intended to question a teacher’s desire to provide a quality and equitable education, but rather to provide strong evidence to alternatives in learning.

**Personal Reflection**

As I mentioned in the introduction, one reason I conducted this study was to provide urban teachers another tool to support students who need an environment that would attend to their academic and emotional needs, but the other reason is personal. I am and have always been a student who is very anxious in school settings. My heart would race the moment I entered the classroom. The institutional look of the classroom and my proximity to others always made me
feel like I was being judged, resulting in a student who did not participate or share his ideas, even though I desperately wanted to. I compared my experience with the experiences of my students in an urban high school, and it became clear to me that many students were anxious just like me. They were anxious because they were scared to walk to school. They were anxious because there were other students that were threatening them. They were anxious because they wanted to do well, but were afraid that they would be judged. My hunch was that their inability to focus was a result of their academic, emotional and physical environment.

It is interesting that as I researched the literature on classroom design, I found few studies for classroom design at the high school level. There are many studies on classroom design for students with disabilities and at the elementary level, so there is a body of work that recognizes the value of classroom design, but not for high school students. I began to wonder why this was the case. As I spoke to experts within education, many attempted to redirect me towards teacher instruction and engagement. The topic of classroom design did not interest the educational experts I encountered because the impact of classroom design did not seem to measure up to the impact of instruction; however, as I shared my topic with parents, professionals outside of education, friends, and students, I overwhelmingly got a positive reaction. These non-educators all shared experiences of being in environments that impeded their ability to interact, to engage, and to be true to themselves. These responses affirmed the need for this study.

Back to the question of why—why are there no studies on classroom design in high school? Is it because there is an expectation that students at this age should just be able to cope with their environment? This seems cruel given the fact that high school students are still not fully mature and still need guidance. Further, as adults we all have experienced tense environments and have gone to peers or colleagues for support in dealing with our environment.
Is it the idea that only children need an aesthetically pleasing environment? This seems hypocritical given that people often create a home environment that is reflective of their personality and needs because it attempts to put them at ease. If there is an acknowledgement that our homes can change our mindsets and moods, is it not logical to create similar environments at school to do the same thing? Is it the idea that high school teachers should only focus on delivering content and not worry about the setup of the classroom, given the high stakes nature of high school? Effective classroom teachers are those who believe in differentiation. Differentiation dictates that teachers provide different students with different avenues to learn. High school is high stakes and it seems that the most effective teachers would incorporate academic, emotional, and physical accommodations to ensure that their students learned.

Whatever the reason that has prevented further exploration of this topic, the justification of this study again comes down to equity and social justice. There is no argument that sound curriculum, the use of best practices, and teacher engagement are key to student success, but it is not all encompassing. We cannot deny that there is a population of students affected by physical environment. When these students are denied access to tools or supports to aid in overcoming this barrier, we are denying them access to a quality education.
APPENDIX A: Classroom Observation Form

<table>
<thead>
<tr>
<th>Interval</th>
<th>Teacher Behaviors</th>
<th>Student Behaviors</th>
<th>Praise (Acad)</th>
<th>Praise (Beh)</th>
<th>BC + (Freq)</th>
<th>BC - (Freq)</th>
</tr>
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APPENDIX B: Classroom Observation Tally Form

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<tr>
<th>Teacher Behaviors</th>
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<th>Total # of Intervals Observed</th>
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<th>% of Intervals</th>
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<td>X 100</td>
<td>%</td>
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<tr>
<td>Monitoring</td>
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<td>X 100</td>
<td>%</td>
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<tr>
<td>Praise - Academic</td>
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<td>%</td>
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<tr>
<td>Praise - Behavior</td>
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<td>Total Praise</td>
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<td>%</td>
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<tr>
<td>BC +</td>
<td></td>
<td>X 100</td>
<td>%</td>
<td></td>
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<tr>
<td>BC -</td>
<td></td>
<td>X 100</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Total Behavior Correction</td>
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<td>X 100</td>
<td>%</td>
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<tr>
<td>On-Task</td>
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<td>X 100</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Target Student</td>
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<td>X 100</td>
<td>%</td>
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<tr>
<td>Other Students</td>
<td></td>
<td>X 100</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Class-wide</td>
<td></td>
<td>X 100</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Off-Task</td>
<td></td>
<td>X 100</td>
<td>%</td>
<td></td>
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<tr>
<td>Target Student</td>
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<td>X 100</td>
<td>%</td>
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<tr>
<td>Other Students</td>
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<td>Class-wide</td>
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<tr>
<td>Disruption</td>
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<td>Aggression</td>
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<tr>
<td>Daydreaming (DD)</td>
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APPENDIX C: Parent Consent Form

University of California, Los Angeles

PARENT PERMISSION FOR MINOR TO PARTICIPATE IN RESEARCH

Classroom Design for Urban Students

Dr. Connie Kasari and Dr. Faye Peitzman, faculty sponsors from the Graduate School of Education and Information Studies and Gabriel Ramirez, a doctoral student and principal investigator from the Educational Leadership Program at the University of California, Los Angeles (UCLA) are conducting a research study for Mr. Ramirez’s dissertation project.

Your child was selected as a possible participant in this study because your child is a student at XXXXX High School and has displayed issues with paying attention. Your child’s participation in this research study is voluntary. If your child is not chosen, your child will still have the opportunity to sit on the yoga ball chairs, and be exposed to the aesthetic changes in the classroom. XXXXX High School has decided to incorporate the use of the yoga balls into the school curriculum.

Why is this study being done?

This study is being done to assess the benefits, if any, of how modifying the design of the classroom can affect a student’s behavior.

What will happen if my child takes part in this research study?

If you agree to allow your child to participate in this study, we would ask him/her to:

• Complete a CBCL questionnaire asking questions about classroom behavior and negative thoughts.
• Complete a pre and post survey about his/her experience as a student
• Be observed sitting on a yoga ball chair although all students in the class will have the opportunity to sit on a yoga ball given that the yoga ball chairs are a part of the school curriculum.
• Be videotaped in his/her classroom setting 3-4 times a week throughout the duration of the study
• Have his/her heart rate measured 3-4 times a week throughout the duration of the study.

How long will my child be in the research study?

Participation will approximately take an hour and a half 3-4 times a week. The entire study will be 3-4 weeks in length.
Are there any potential risks or discomforts that my child can expect from this study?

- There are minimal foreseeable risks.

Are there any potential benefits to my child if he or she participates?

There are no direct benefits from your child participating in this study.

Will information about my child’s participation be kept confidential?

Any information that is obtained in connection with this study and that can identify your child will remain confidential. It will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of keeping data locked and secured by password. Confidentiality may be broken if the child expresses a desire to harm him/herself.

What are my and my child’s rights if he or she takes part in this study?

- You can choose whether or not you want your child to be in this study, and you may withdraw your permission and discontinue your child’s participation at any time.
- Whatever decision you make, there will be no penalty to you or your child, and no loss of benefits to which you or your child were otherwise entitled.
- Your child may refuse to answer any questions that he/she does not want to answer and still remain in the study.

Who can I contact if I have questions about this study?

- The research team:
  If you have any questions, comments or concerns about the research, you can talk to the one of the researchers. Please contact:

  Gabriel Ramirez (Principal Investigator) at XXX-XXX-XXXX or email at XXXXXXXxxx@gmail.com.

- UCLA Office of the Human Research Protection Program (OHRPP):
  If you have questions about your child’s rights while taking part in this study, or you have concerns or suggestions and you want to talk to someone other than the researchers about the study, please call the OHRPP at (310) 825-7122 or write to:

  UCLA Office of the Human Research Protection Program
  11000 Kinross Avenue, Suite 211, Box 951694
Los Angeles, CA 90095-1694

You will be given a copy of this information to keep for your records.

SIGNATURE OF PARENT OR LEGAL GUARDIAN

____________________________________
Name of Child

____________________________________
Name of Parent or Legal Guardian

____________________________________  _________________
Signature of Parent or Legal Guardian  Date

SIGNATURE OF PERSON OBTAINING CONSENT

____________________________________  ______________________
Name of Person Obtaining Consent  Contact Number

____________________________________  _________________
Signature of Person Obtaining Consent  Date
PERMISO DE LOS PADRES DE MENORES PARA PARTICIPAR EN LA INVESTIGACIÓN

Diseño de clase para estudiantes urbanos

Dr. Connie Kasari y la Dra. Faye Peitzman, patrocinadores de la facultad de la Escuela de Graduados de Estudios de la Información y la Educación y Gabriel Ramírez, estudiante de doctorado e investigador principal del Programa de Liderazgo para la Educación en la Universidad de California, Los Angeles (UCLA) están realizando un estudio de investigación para el proyecto de tesis del señor Ramírez.

Su hijo fue seleccionado como posible participante en este estudio porque su hijo es un estudiante de la XXXXX High School y ha mostrado problemas con el pago de la atención. La participación de su hijo en este estudio de investigación es voluntaria. Si no se elige a su hijo, su hijo seguirá teniendo la oportunidad de sentarse en las sillas de la bola de la yoga, y ser expuesto a los cambios estéticos en el salon. XXXX High School ha decidido incorporar el uso de las pelotas de yoga en el currículo escolar.

Por qué se realiza este estudio?

Este estudio se realizó para evaluar los beneficios, si los hubiere, de cómo modificar el diseño de la sala de clases puede afectar el comportamiento de un estudiante.

¿Qué pasará si mi hijo participe en este estudio de investigación?

Si está de acuerdo para permitir que su hijo participe en este estudio, le pedimos que él / ella:

• Completar un CUESTIONARIO CBCL a hacer preguntas sobre el comportamiento en clase y los pensamientos negativos.
• Completar un pre y encuesta post sobre su experiencia como estudiante
• Estar en video en su salón de clases a 3-4 veces a la semana durante toda la duración del estudio
• Haga que su ritmo cardíaco medido 3-4 veces a la semana durante toda la duración del estudio.
• Ser observado sentado en una silla de bola de yoga, aunque todos los alumnos de la clase tendrán la oportunidad de sentarse en una pelota de yoga, dado que las sillas de la bola de yoga son una parte del currículo escolar.

¿Cuánto tiempo estará mi hijo en el estudio de investigación?
La participación será de aproximadamente tardar una hora y media de 3-4 veces por semana. El estudio completo será de 3-4 semanas de longitud.

¿Existen riesgos potenciales o molestias que mi hijo puede esperar de este estudio?

• Existen riesgos previsibles mínimos.

¿Existen beneficios potenciales para mi hijo si él o ella participa?

No hay beneficios directos de su hijo que participan en este estudio.

¿La información sobre la participación de mi hijo se mantendrá confidencial?

Cualquier información que se obtenga en este estudio y que pueda identificar a su hijo se mantendrá confidencial. Esto será compartida solamente con su permiso o de lo requerido por la ley. Se mantendrá la confidencialidad mediante la conservación de los datos bloqueado y protegido por contraseña. La confidencialidad puede romperse si el niño expresa un deseo de dañar a él / ella misma.

¿Cuáles son mis derechos y los de mi hijo si él o ella toma parte en este estudio?

• Usted puede elegir si desea o no que su hijo participe en este estudio, y usted puede retirar su permiso y suspender la participación de su hijo en cualquier momento.
• Sea cual sea la decisión que tomes, no habrá ninguna pena a usted o su hijo, y sin pérdida de beneficios a los que usted o su hijo estuviera facultada.
• Su niño puede negarse a contestar cualquier pregunta que él / ella no quería responder y aún permanecer en el estudio.

¿A quién puedo contactar si tengo preguntas sobre este estudio?

• El equipo de investigación:
Si usted tiene alguna pregunta, comentario o inquietud acerca de la investigación, usted puede hablar con el uno de los investigadores. Por favor, póngase en contacto con:

Gabriel Ramírez (Investigador Principal) al XXX-XXX-XXXX o al correo electrónico XXXXXXXXXXXX@gmail.com.

• Oficina de UCLA del Programa de Protección de la Investigación Humana (OHRPP):
Si tiene alguna pregunta acerca de los derechos de su hijo durante su participación en este estudio, o si tiene dudas o sugerencias y quiere hablar con alguien que no sea los investigadores sobre el estudio, por favor llame a la OHRPP al (310) 825-7122 o escriba a:
UCLA Oficina del Programa de Protección de la Investigación Humana  
11000 Kinross Avenue, Suite 211, Caja de 951 694  
Los Ángeles, CA 90095-1694

Se le dará una copia de esta información para mantener en sus archivos.

FIRMA DEL PADRE O TUTOR LEGAL

________________________________________________________________________
Nombre del niño

________________________________________________________________________
Nombre del Padre o Tutor Legal

________________________________________________________________________
Firma del Padre o Tutor Legal
                       Fecha

FIRMA DE LA PERSONA QUE OBTIENE EL CONSENTIMIENTO

________________________________________________________________________
Nombre de la persona que obtiene el consentimiento

________________________________________________________________________
Número de contacto

________________________________________________________________________
Firma de la persona que obtiene el consentimiento

________________________________________________________________________
Fecha
UNIVERSITY OF CALIFORNIA, LOS ANGELES

ADOLESCENT (Ages 13-17) ASSENT TO PARTICIPATE IN RESEARCH

Classroom Design for Urban Students

You are asked to participate in a research study conducted by Dr. Connie Kasari and Dr. Faye Peitzman, faculty sponsors from the Graduate School of Education and Information Studies and Gabriel Ramirez, a doctoral student and principal investigator from the Educational Leadership Program at the University of California, Los Angeles (UCLA). You were selected as a possible participant in this study because you are a student at XXXXX High School. Your participation in this research study is voluntary.

Why is this study being done?

This study is being done to assess the benefits, if any, of how modifying the design of the classroom can affect a student’s behavior.

What will happen if I take part in this research study?

Please talk this over with your parents before you decide whether or not to participate. We will also ask your parents to give their permission for you to take part in this study. But even if your parents say “yes” you can still decide not to do this.

If you volunteer to participate in this study, the researcher will ask you to do the following:

• Complete a CBCL questionnaire asking questions about classroom behavior and negative thoughts.
• Complete a pre and post survey about your experience as a student
• Sit on a yoga ball chair
• Be videotaped in your classroom 3-4 times a week throughout the duration of the study
• Have your heart rate measured 3-4 times a week throughout the duration of the study.

If you are not chosen to participate in the research study, you will still have the opportunity to sit on a yoga ball chair, and be exposed to the aesthetic changes in the classroom. XXXXX High School has decided to incorporate the use of the yoga balls into the school curriculum.
How long will I be in the research study?

Participation will approximately take an hour and a half 3-4 times a week. The entire study will be 3-4 weeks in length.

Are there any potential risks or discomforts that I can expect from this study?

• There are minimal foreseeable risks.

Are there any potential benefits if I participate?

There are no direct benefits from your participation in this study.

Will information about me and my participation be kept confidential?

Any information that is obtained in connection with this study and that can identify your child will remain confidential. It will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of keeping data locked and secured by password.

• Withdrawal of participation by the investigator

The investigator may withdraw you from participating in this research if circumstances arise which warrant doing so. If the participant does not meet the requirements of participation you may have to drop out, even if you would like to continue. The investigator will make the decision and let you know if it is not possible for you to continue.

What are my rights if I take part in this study?

You may withdraw your assent at any time and discontinue participation without penalty or loss of benefits to which you were otherwise entitled.

You can choose whether or not you want to be in this study. If you volunteer to be in this study, you may leave the study at any time without consequences of any kind. You are not waiving any of your legal rights if you choose to be in this research study. You may refuse to answer any questions that you do not want to answer and still remain in the study.

Who can answer questions I might have about this study?

If you have any questions, comments or concerns about the research, you can talk to the one of the researchers. Please contact:
Gabriel Ramirez (Principal Investigator) at XXX-XXX-XXXX or email at XXXXXXXXXXX@gmail.com.

If you wish to ask questions about your rights as a research participant or if you wish to voice any problems or concerns you may have about the study to someone other than the researchers, please call the Office of the Human Research Protection Program at (310) 825-7122 or write to Office of the Human Research Protection Program, UCLA, 11000 Kinross Avenue, Suite 211, Box 951694, Los Angeles, CA 90095-1694.

**SIGNATURE OF STUDY PARTICIPANT**

I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

________________________________________________________________________

Name of Participant

________________________________________________________________________

Signature of Participant __________________________ Date __________________________

**SIGNATURE OF PERSON OBTAINING ASSENT**

In my judgment the participant is voluntarily and knowingly agreeing to participate in this research study.

________________________________________________________________________

Name of Person Obtaining Assent __________________________ Contact Number __________________________

________________________________________________________________________

Signature of Person Obtaining Assent __________________________ Date __________________________
APPENDIX F: SCRIPT FOR STUDY

Script

Introduction

Hello, as you know, I am teacher here, but I am also a graduate student at UCLA. I am getting my doctorate in Educational leadership. Part of the requirements to receive your doctorate is to conduct research, and so today I would like to talk to you about the research I would like to conduct. My study will focus on the benefits, if any, on how modifying the classroom can affect student behavior.

All of you have a student assent packet in front of you, and so I would like to review the packet and discuss the study, and explain how you may be able to be a participant in this study.

Participation

To participate, you will need to talk this over with your parents before you decide whether or not to participate. We will ask you parents to give their permission for you to take part in this study. But even if your parents say “yes” you can decide not to do this. Also, know that if you decide not to participate in this study, your participation in no way affects your grade or your standing in this class. This is completely voluntary.

If you volunteer to participate in this study, you will be asked to do the following:

- Complete a CBCL questionairre asking questions about classroom behavior and negative thoughts.
- Complete a pre and post survey about your experience as a student
- Sit on a yoga ball chair
- Be videotaped in your classroom 3-4 times a week throughout the duration of the study
- Have your heart rate measured 3-4 times a week throughout the duration of the study.

If you are not chosen to participate in the research study, you will still have the opportunity to sit on a yoga ball chair, and be exposed to the aesthetic changes in the classroom. XXXXX High School has decided to incorporate the use of the yoga balls into the school curriculum. If you do not want to sit on the balls, you can choose to sit on a standard chair.

How long will you be in the research study?

Participation will approximately take an hour and a half 3-4 times a week. The entire study will be 3-4 weeks in length.

Are there any potential risks or discomforts that you can expect from this study?

- There are minimal foreseeable risks.
Are there any potential benefits if I participate?

There are no direct benefits from your participation in this study.

Will information about me and my participation be kept confidential?

Any information that is obtained in connection with this study and that can identify you will remain confidential. It will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of keeping data locked and secured by password.

• Withdrawal of participation by the investigator

I (the principal investigator) may withdraw you from participating in this research if circumstances arise which warrant doing so. If you (the participant) does not meet the requirements of participation you may have to drop out, even if you would like to continue. I will make the decision and let you know if it is not possible for you to continue.

What are your rights if you take part in this study?

You may withdraw your assent at any time and discontinue participation without penalty or loss of benefits to which you were otherwise entitled.

You can choose whether or not you want to be in this study. If you volunteer to be in this study, you may leave the study at any time without consequences of any kind. You are not waiving any of your legal rights if you choose to be in this research study. You may refuse to answer any questions that you do not want to answer and still remain in the study.

Who can answer questions about this study?

If you have any questions, comments, or concerns about the research, you can contact me. My information is listed in your packet or you can contact the Office of the Human Research Protection Program. Their information is in the packet as well.

Signatures

If you are interested, you will need to sign this assent form. Also, your parents will need to sign a consent form. Those students who return both forms will be considered for participation. I will let those students know who I have chosen to participate in the study.

Q & A

Any questions.

Thank you.
**Student Questionnaire**

*Please answer the following questions using the scale below.*

<table>
<thead>
<tr>
<th>Question</th>
<th>Extremely Good</th>
<th>Quite Good</th>
<th>Slightly Good</th>
<th>Fine/Average</th>
<th>Slightly Bad</th>
<th>Quite Bad</th>
<th>Extremely Bad</th>
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</thead>
<tbody>
<tr>
<td>1. How do you perform academically in school?</td>
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<td>2. How do you perform socially in school?</td>
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<td>3. What is your stress level at home?</td>
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<td>4. What is your stress level on the way to school?</td>
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<tr>
<td>5. What is your stress level in the classroom?</td>
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<td>6. How important is school to you?</td>
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<td>7. How much does the classroom environment affect your learning?</td>
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<td>8. Does sitting next to someone affect your learning?</td>
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<td>9. How much does the teaching style of your teacher affect your learning?</td>
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<td>10. How often do you feel you get off-task?</td>
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</tr>
</tbody>
</table>
Please circle all that apply.

1. How do you best learn?
   a) Lecture
   b) Group discussion
   c) Working in pairs
   d) Group work
   e) Independently

2. If you could change the physical design of the classroom, what would you change that you think would improve your performance?
   a) The chairs.
   b) The color of walls.
   c) The lighting.
   d) The setup of chairs.
   e) Add plants.

Additional Comments
APPENDIX H: Picture of Modified Classroom
References


American Heart Association. (n.d.). *All about Heart Rate (Pulse)*. Retrieved from http://www.heart.org/HEARTORG/Conditions/More/MyHeartandStrokeNews/All-About-Heart-Rate-Pulse_UCM_438850_Article.jsp


Daly, J., Burchett, M., & Torpy, F. (2010). Plants in the Classroom can Improve Student Performance. *Centre for Environmental Sustainability, Faculty of Science University of Technology, Sydney*. Retrieved from http://scholar.google.com/scholar?hl=en&q=plants+in+the+classroom+can+improve+student+performance&btnG=Search&as_sdt=0%2C5&as_ylo=&as_vis=0


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