

USING GAMIFICATION TO IMPROVE STUDENT
ENGAGEMENT OF AFRICAN-AMERICAN MIDDLE-SCHOOL
STUDENTS FROM LOW-SOCIOECONOMIC-STATUS HOUSEHOLDS

A Record of Study

by

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ABSTRACT

This quantitative research project sought to increase the student engagement of seventh- and eighth-grade African-American students from low-income homes by introducing gamification as a wraparound intervention. During the 5 weeks of the program, 150 students worked in teams to earn points by completing classwork assignments and winning two different student challenges. Results were tracked on a visible leaderboard posted in the classroom. The Student Engagement Inventory, which measures student engagement on six different engagement indicators, was used as the pretest and posttest. Specifically, the intervention activities addressed three particular indicators of engagement—teacher-student relationships, control and perceived relevance of schoolwork, and peer support for learning. According to the resulting p values from the overlapping-samples t tests, the peer connections indicator of the Student Engagement Inventory was most impacted by the gamification intervention with African-American students, showing statistically significant changes for five of the six questions—the implication being that students felt more connected to each other as a result of the gamification intervention. This study demonstrates that middle-school African-American students from low-income homes have needs that set them apart from their classmates of other ethnic groups and of other socioeconomic tiers. Suggestions for future studies include isolating specific game mechanics to observe their effects on this demographic and qualitative studies from the student and teacher perspective.

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CHAPTER I

INTRODUCTION: LEADERSHIP CONTEXT AND PURPOSE OF THE ACTION

National Context

The current school system in the United States was not created to educate African-American students. Despite numerous attempts to retrofit public schools to accommodate all students, schools are still failing African-American students miserably. Deficit thinking is prevalent among teachers; many believe that African-American students are broken and that nothing can be done by teachers at the classroom level to offer this set of students an equal chance at success. However, research points toward a larger, deeper issue. In this work, I endeavor to explore the historical context of the racial achievement and discipline gap in the United States and to examine the unique needs of middle-school African-American students in poverty. Additionally, I present current findings on motivation and then synthesize this information to present ideas for customizing the concept of gamification according to research as a possible solution to maintaining classroom engagement for African-American students of low socioeconomic status.

Racial discrimination in the United States has affected every part of society, especially the school systems. Ladson-Billings (1997) documented the nation's woeful history of excluding students of color from public education, from slavery until desegregation in the late 1960s. When public schooling was allowed for African-American children after the Civil War, the segregated African-American schools were underresourced, lacking basic learning tools like books and adequate facilities (Ladson-Billings, 2006). Despite these inadequacies, as reported by Lee (2002), the achievement gap began to close in the 1970s and 1980s. The gains were lost during the 1990s, however. Ladson-Billings (2006) stated that even when family income is

factored out, White students still outperform African-American students. Although segregation has been ruled unconstitutional, deficit mindsets in education remain.

Historical and systematic racial discrimination in United States history is still affecting teaching today. Ladson-Billings (2006) argued that the achievement disparities between White students and minority students is actually a multifaceted deficit from decades of social and economic racism in the United States. Bottiani et al. (2018) found that teachers often avoid overt discussions about the existence of classroom racism because of fear. This avoidance of racial issues at the classroom level contributes to the chasm that exists between the standardized test scores achieved by White students (higher scores) and African-American students (lower scores). Teachers of all races hinder the growth and development of their students through their ignorance of minority-student cultures and behaviors (Bowman et al., 2018). Therefore, the well-documented achievement and discipline gaps in the United States persist as national problems.

In addition to academic disparities in achievement between the races, there is also a glaring difference between the classroom disciplinary practices enforced with African-American students versus White students. According to Butler et al. (2012), the term “discipline gap” refers to the overrepresentation of minority students who have been suspended or issued other out-of-school disciplinary actions. The discipline gap has been an issue of concern since the 1970s, and it disproportionately affects male African-American students (Bottiani et al., 2018; Butler et al., 2012). Teachers need creative, concrete strategies to combat explicit bias and connect more deeply with their minority students.

To exacerbate these issues, racial demographics in the United States show growth in the number of African-American students without corresponding growth in the number of African-

American teachers. Cherng and Halpin (2016) assessed that more than 80% of teachers are White, although racial minority groups currently comprise the majority of students. This disproportion means that the majority of African-American students are taught by teachers who do not look like them (Coggins & Campbell, 2008). Cherng and Davis (2019) discovered that African-American and Latino/a teachers are more aware and knowledgeable of the cultures of their students and are better able to use that knowledge to create positive classroom environments. Researchers and teachers must find creative solutions to the cultural mismatch that is prevalent at the classroom level so that all students feel represented and valued.

Situational Context

African-American students from low-socioeconomic-status households have additional unique challenges that need to be addressed in their curriculum. According to Dell'Angelo (2016), a direct correlation exists between high poverty and low student success on standardized tests. The author went on to say that Hispanic and African-American students are disproportionately affected by poverty. Researchers have also found that the time frame during which a student lives in poverty affects the severity of the impact, with middle-school students being more adversely impacted than older adolescents (Duncan et al., 1998). Jensen (2013) also reported that poverty adversely affects student effort and motivation. The researcher asserted that students in poverty are more likely to display symptoms of learned helplessness and depression, but that effective teachers can positively impact student effort. Student motivation and engagement strategies for African-American students from low-income households must be customized to the demographic to be effective. Intervention strategies must be culturally relevant, as well as provide students from low-socioeconomic-status households the support they need in the classroom.

Instead of competing with existing technologies for the attention of their students, educators in the classroom can harness this power in meaningful ways to improve educational outcomes. Increasing student engagement for African-American students could help increase learning and reduce behavioral issues in the classroom.

Relevant History of the Problem

In this study, I endeavored to utilize the research findings on the needs of African-American students and the suggested interventions for students in poverty to positively impact the engagement of the seventh- and eighth-grade students whom I teach at a mid-sized urban middle school in a large Texas school district. Henceforth, I refer to my school as “Urban Middle School” and to my district as “Metropolitan Independent School District” for the sake of anonymity. Urban Middle School teachers and students are struggling with focus and engagement during class time. According to the spring 2019 Metropolitan Independent School District (ISD) Student Experience Survey, Urban Middle School scored 62% favorable responses for the student engagement domain. This lack of engagement may be caused by many factors. Current conditions at the school do not suggest that this number will increase without intervention. For the 2019–2020 school year, half of the school administrative staff was new. Additionally, 63% of the teaching positions were either vacant or filled by teachers new to the campus. This lack of teaching consistency has contributed to student apathy in class. Additionally, 70% of Urban Middle School students are classified as at-risk, 72% of students are African American, 24% of students are Hispanic, and 98.7% of students are categorized as low-socioeconomic-status, so motivation may be reduced by the effects of poverty, such as low parent expectations for grades (daFonseca, 2014). Additionally, students may have trouble developing a growth mindset given these poverty factors (Claro et al., n.d.). Students’ low

motivation levels result in low student effort and, consequently, lower grades. Also, students who struggle to embrace a growth mindset are more resistant to teacher encouragement, providing less opportunities to deepen learning with more rigorous content.

Significance of the Problem

According to van Roy and Zaman (2018), student motivation is highly touted as one of the key principles driving student success and is positively correlated with student achievement (Herges et al., 2017). However, researchers have found that student motivation is negatively correlated with student age (van Roy & Zaman, 2018). Therefore, middle- and high-school students are less motivated to learn than elementary- or preschool students and could benefit from novel teaching structures to encourage engagement. Davis and Forbes (2016) admonished that interventions to increase student motivation and engagement have to be strategic and purposeful.

In order for the United States to maintain an educated workforce, new, promising, teacher-friendly, research-based strategies must be identified to capture the attention and imagination of a generation that is currently marginalized, but that will soon serve as the nation's leadership. Researchers have agreed that a different approach is needed to ensure that African-American students have access to educational opportunities that are equal to their White counterparts. "Culturally relevant pedagogy," as defined by Gloria Ladson-Billings (1995), is the inclusion of the culture of the student to facilitate academic success. African-American students need specific help to close the gap. Therefore, new preventative classroom teaching techniques are required to bridge the divide and eventually close the achievement gap. Bottiani et al. (2018) asserted that the better course of action is for teachers to proactively eliminate racial and cultural barriers versus reactively responding to racially influenced issues in the classroom.

Changing teachers' approaches to engagement strategies could help prevent disciplinary issues and also increase learning. Students who are fully immersed in the curriculum on a daily basis do not have time to cause classroom disruptions, so an engaged student is less likely to cause disciplinary problems. Therefore, as Hale (2016) suggests, it is incumbent upon classroom teachers to create environments where students learn how to be motivated and engaged in learning. Additionally, Jensen (2013) recommended that teachers of students in poverty emphasize the characteristics of a growth mindset to increase student engagement. A new, promising approach that could possibly encompass both African-American culturally responsive techniques and provide opportunities for students in poverty to develop socioemotional fortitude is gamification. Increasing student engagement for African-American students could help increase learning and reduce behavioral issues in the classroom.

Research Questions

Quantitative data analysis was used to gauge the effects of gamification on student engagement. My comparative research question was as follows: What are the differences in student engagement before gamification intervention and after gamification intervention? The Student Engagement Instrument (SEI) presented by Appleton et al. (2006) measures six different dimensions of student engagement. I conducted a pre-experimental, one-group pretest-posttest design as defined by Creswell (2014) to determine if the use of a leaderboard and student teams increases student engagement in three of the six dimensions—teacher-student relationships, students' belief in the relevance of their coursework, and peer connections. The following are three subresearch questions addressed in this study: (1) What are the differences in the student engagement indicator scores of teacher-student relationships before gamification intervention and after gamification intervention? (2) Does implementing gamification increase students'

belief in the relevance of their work? (3) Does implementing gamification increase peer connections? The data yielded can aid the administration at Urban Middle School in deciding whether gamification could be helpful in increasing student engagement in other classes as well.

Researcher's Roles and Personal Histories

Whenever discussions of career choice arose during my high-school years, people always asked if I planned to be a teacher. I, in turn, vehemently denied that teaching was my calling and enrolled at the University of North Texas as a premedicine/biology major with a minor in chemistry. During my senior year of college, I worked at Eckerd Pharmacy as a cashier, which meant that I had to work every weekend and miss many social gatherings. My college roommate, on the other hand (who happens to be a member of my current doctoral cohort at Texas A&M University), worked at a childcare center near campus—she was off every weekend. The hours she worked enticed me, so I interviewed at the childcare center and quickly began a new job teaching 2-year-old toddlers. I instantly fell in love with watching them grow and gain new skills. Although I had already completed 100 hr of my 121-hr degree, I changed my major to child development. I have been working with or for children ever since. For the last 23 years, my providential discovery of my passion for education has taken me from working in the nonprofit arena to working as a teacher and administrator in schools. Over this evolution, my educational philosophy has been grounded in the belief that all children should have equitable access to high-quality learning experiences.

Over my 14 years of teaching, I have taught preschool through 12th-grade students at a private school, magnet schools, and currently at a turnaround-model campus in Metropolitan ISD. While teaching engineering at a highly touted magnet school in the district, I completed my Master of Educational Technology at Texas A&M University Commerce in order to gain content

knowledge to share with my students. Not being an engineer by trade, I had to humble myself and practice the teacher-as-facilitator model, which completely transformed and solidified my educational approach. During those 4 years, I discovered that I will always be a preschool teacher at heart, conducting my classroom as a laboratory for experiential learning driven by strong teacher-student relationships.

Now, I am completing my Doctor of Education in curriculum and instruction. After many years of deliberation, I chose Texas A&M University because of its strong reputation as an academic juggernaut, as well as its deep traditions and network. I currently serve as the college and career readiness teacher at Urban Middle School. Five years ago, I transferred from an elite magnet school and jewel of the district to Urban Middle School, one of the toughest schools in the district—it had been on the “improvement required” (IR) list of the Texas Education Agency for 3 consecutive years. A new school-turnaround district initiative paid top-performing teachers additional stipends for 3 years for teaching at selected high-needs campuses. I came to Urban Middle School to live out my theoretical belief in equity—students with the most challenges deserve the best teachers to help them overcome adversity. During my time at Urban Middle School, I discovered the term “achievement gap” and became obsessed with understanding the issue from every angle, including what I could do as a teacher to decrease the inequity. I began my doctoral studies to make a contribution to the existing practical knowledge on the achievement gap.

Journey to the Problem

Urban Middle School spent 3 consecutive school years (2012–2013 to 2014–2015) on the IR list of the Texas Education Agency. During the 2015–2016 school year, Urban Middle School was targeted by Metropolitan ISD to become a part of its new school-turnaround

initiative. As a part of the program, the administrative team and nearly all of the teaching staff were replaced with highly effective teachers from across the district. The new administrative staff and the teaching staff were all given additional stipends for the 3 years that the campus took part in the initiative. Urban Middle School earned its way off of the IR list after the 1st year of the turnaround initiative and has met standards each year since. The campus earned a C rating according to the state's new accountability system for the 2018–2019 school year, maintaining the academic ground gained by the school during its time in the school-turnaround initiative.

However, the 2019–2020 school year brought about several shifts in Urban Middle School personnel. The campus had a new, 1st-year principal and a new, 1st-year assistant principal. Additionally, 63% of the teaching positions were either vacant or filled by teachers new to the campus. In contrast, all teaching positions were filled during Urban Middle School's tenure in the school-turnaround program, with the exception of the sixth-grade social studies teaching position the last year of the program.

As I observed this shift in the campus staff, climate, and culture, I couldn't help but wonder—how do we maintain the hard-fought gains derived from the school-turnaround program despite the high level of staff turnover? Are there universal interventions that are not content-dependent that can possibly be implemented schoolwide to support teaching and learning? How do we keep seventh- and eighth-grade students engaged and motivated as they work through this huge number of personnel changes?

Every year since I arrived at Urban Middle School during the 2015–2016 school year, the 1st year of participation in the school-turnaround program, I have run some iteration of gamification intervention during the spring semester to keep students (and myself, honestly) focused and engaged during the last few months of school. Each year, I have experimented with

different approaches, different ways to earn points, different challenges, different ways to set up groups, etc. Anecdotally, I have discovered that adding game elements to my class structure not only increases student work output, but it also seems to bring a sense of adventure and fun to my classroom that is otherwise absent. Gamification is a passion of mine, and it became obvious that the concept might have value for other teachers at my campus. First, I needed to somehow quantify the impact of the gamification intervention on the students whom I teach. That thought process led me to develop this study to examine the impact of gamification on student engagement for seventh- and eighth-grade African-American students at Urban Middle School.

Significant Stakeholders

The major stakeholder groups in this research study are the Metropolitan ISD school-turnaround initiative developers, the Urban Middle School administrative team, the teachers of Urban Middle School, and the seventh- and eighth-grade students of Urban Middle School. Each group stands to potentially be positively impacted by an increase in student engagement at Urban Middle School through gamification.

The Metropolitan ISD school-turnaround initiative is now in its third iteration of the program. The first version, which was implemented at Urban Middle School from 2015 to 2018, was the most aggressive. The entire administrative staff and teaching staff were replaced, with new personnel receiving financial incentives so that the students needing the most support at struggling schools could be educated by the district's best teachers and administrators. The original school-turnaround initiative ran for 3 years with the first seven schools. Six of the seven schools earned their way off of the state's IR list within the 1st year. However, Metropolitan ISD did not seem to have a clear plan for how to sustain those initial gains once the school-

turnaround initiative concluded. Replicable classroom interventions like gamification could possibly help schools sustain student engagement at little to no cost.

The Urban Middle School administrative staff is tasked with reducing disciplinary referrals and increasing time on task for the students and teachers whom it serves. One of the most successful strategies for reducing disciplinary issues in the classroom is for students to participate in engaging lesson activities. Applying gamification strategies schoolwide could possibly increase student motivation and, therefore, decrease disciplinary issues at Urban Middle School.

Teachers at Urban Middle School are tasked with teaching a high percentage of students from low-socioeconomic-status households who often arrive at school with gaps in academic knowledge. Not only do teachers have to fill those gaps, they then have to prepare the students for multiple high-stakes district and state assessments. For example, eighth-grade students are required to pass four standardized exams: mathematics, reading, social studies, and science. Increased student engagement means more focused time in the classroom for teachers to deliver content to cover gaps and impart information needed for successfully completing the current grade level.

Finally, the students of Urban Middle School would benefit most directly from a classroom intervention that increases their engagement and motivation. Given the delta between the achievement gap and college/career readiness, the more time that students spend on task and focused, the more time they have available to productively prepare them for academic success.

Important Terms

- Achievement gap—the statistical difference in standardized test scores between nonminority students and minority students

- Gamification—the application of game mechanics to nongame environments
- Game mechanics—components used in video-game environments to enhance player satisfaction such as multiple tries to conquer challenges, points, use of a leaderboard, etc.
- Leaderboard—a visual representation of the current points earned by individuals or teams
- Group-based contingency—the success of a team or group being dependent on the performance of each member
- Elective class—a class taken at the choice of students; at Urban Middle School, the elective classes offered are band, art, and physical education

Closing Thoughts on Chapter I

As an African-American woman, I have a vested interest in making sure that future generations of African-American students are adequately ready for college and careers despite the systematic issues that prevail. I am a researcher who has focused my career on mitigating equity issues. Specifically, I have been a teacher at Urban Middle School for 5 years at the time of this publication. My students deserve a level educational playing field. I endeavor to develop a template for implementing gamification at Urban Middle School as a tool to support teaching and learning.

Successful implementation of a gamification intervention in my career/technology education classes could lead to increased engagement in other types of classrooms at Urban Middle School. Historically, Urban Middle School has struggled to keep pace with the performance of other Metropolitan ISD middle schools. The school-turnaround initiative evened the playing field, resulting in 4 successful years for Urban Middle School. During the 5th year after implementing the school-turnaround initiative, the campus faced high teacher turnover and new, inexperienced administrators. This study presents gamification as a valuable tool for

increasing student classroom engagement for African-American middle-school students at Urban Middle School. Higher engagement levels can increase the time on task, giving teachers the ability to cover learning gaps and impart grade-level content.

CHAPTER II
REVIEW OF SUPPORTING SCHOLARSHIP

Introduction

Urban Middle School is situated in a high-need region of Metropolitan ISD. After 4 consecutive years on the Texas Education Agency’s IR list, the campus was one of the first seven schools selected to participate in a new Metropolitan ISD school-turnaround initiative during the 2015–2016 school year. With a new administrative staff and a new teaching staff, the school moved off the IR list during its 1st year of the program. It maintained its gains throughout the 3 school years under the school-turnaround program.

Since Urban Middle School exited the school-turnaround initiative after 3 years in the program, though, students have struggled with focus and engagement during class time. According to the spring 2019 Metropolitan ISD Student Experience Survey, Urban Middle School scored 62% favorable responses for the student engagement domain, and current conditions at the school do not suggest that this number will increase without intervention. This lack of engagement may have been caused by many factors. For the 2019–2020 school year, half of the school administrative staff was new. Additionally, 63% of the teaching positions were either vacant or filled by teachers who are new to the campus. This lack of teaching consistency has contributed to student apathy in class. Additionally, the issue of student disengagement has also affected teachers who teach art, technology, and band. Because of the staffing constraints, students at Urban Middle School have not been allowed to select their noncore classes, removing student autonomy from the scheduling process.

During this time, my seventh- and eighth-grade students were often disinterested and disengaged and retreated to their cell phones instead of genuinely engaging in the work presented

by the teacher. Seventy percent of Urban Middle School students are classified as at-risk, 72% are African American, 24% are Hispanic, and 98.7% are categorized as low-socioeconomic-status. Additionally, according to Metropolitan ISD data, Urban High School, which serves as the only high school to which middle and elementary schools feed in the district, had 5% of 2018 seniors meet college-readiness standards on the ACT/SAT. If Urban Middle School students do not have a firm academic foundation established at the middle grade levels, replete with the habit of engaging fully in class, their chances of graduating college-ready will be even slimmer. On a broader scale, students in this age group without the necessary foundation for college readiness are less likely to be agile learners and problem-solvers, which are necessary characteristics of future community and national leaders.

In this review of existing literature, I first explore the historical context of the racial achievement and discipline gaps in the United States in order to validate the need for culturally responsive pedagogy. Next, I summarize findings on culturally responsive teaching practices to highlight possible answers to the needs of African-American students, followed by examining the unique needs of students in poverty and explaining some specialized developmental needs of middle school-aged students. Then, I present current findings on engagement and explain how gamification could be a potential solution. I synthesize ideas for customizing the concept of gamification according to research as a possible solution to maintaining classroom engagement for African-American students of low socioeconomic status.

Relevant Historical Background

The current school system in the United States was not created to educate African-American students. Despite numerous attempts to retrofit the nation's public schools to accommodate all students, schools are still failing African-American students miserably. Deficit

thinking is prevalent among teachers, causing many to believe that African-American students are broken and that nothing can be done by teachers at the classroom level to offer this set of students an equal chance at success. However, research points toward a larger, deeper issue.

The Need for Culturally Responsive Pedagogy

Racial discrimination in the United States has affected every part of society, especially the school systems. Ladson-Billings (1997) documented the nation's woeful history of excluding students of color from public education, from slavery until integration in the late 1960s. When public schooling was allowed for African-American children after the Civil War, the segregated African-American schools were underresourced, lacking basic learning tools like books and adequate facilities (Ladson-Billings, 2006). Despite these inadequacies, Lee (2002) reported that the achievement gap began to close in the 1970s and 1980s. The gains were lost during the 1990s, however. Ladson-Billings (2006) stated that even when family income is factored out, White students still outperform African-American students. Although segregation has been ruled unconstitutional, deficit mindsets in education remain.

Historical and systematic racial discrimination in United States history is still affecting teaching today. Ladson-Billings (2006) argued that the achievement disparities between White students and minority students is a multifaceted deficit from decades of social and economic racism in the United States. Bottiani et al. (2018) found that teachers often avoid overt discussions about the existence of classroom racism because of fear. This avoidance of racial issues at the classroom level contributes to the chasm between the standardized test scores achieved by White students (higher scores) and African-American students (lower scores). Teachers of all races hinder the growth and development of their students through their ignorance of minority-student cultures and behaviors (Bowman et al., 2018; Trotman Scott &

Moss-Bouldin, 2014). Therefore, the well-documented achievement and discipline gaps in the United States persist as national problems.

In addition to academic disparities in achievement between the races, there is also a glaring difference between the classroom disciplinary practices enforced with African-American students versus White students. According to Butler et al. (2012), the discipline gap refers to the overrepresentation of minority students who have been suspended or issued other out-of-school disciplinary actions. The discipline gap has been an issue of concern since the 1970s, and it disproportionately affects male African-American students (Bottiani et al., 2018; Butler et al., 2012). Teachers need creative, concrete strategies to combat explicit bias and connect more deeply with their minority students.

To exacerbate these issues, racial demographics in the United States show growth in the numbers of African-American students without corresponding growth in the number of African-American teachers. Cherng and Halpin (2016) assessed that over 80% of teachers are White, although racial minority groups currently comprise the majority of students. This disproportion means that the majority of African-American students are taught by teachers who do not look like them (Coggins & Campbell, 2008). Cherng and Davis (2019) discovered that African-American and Latino/a teachers are more aware and knowledgeable of the cultures of their students and are better able to use that knowledge to create positive classroom environments. Researchers and teachers must find creative solutions to the cultural mismatch that is prevalent at the classroom level so that all students feel represented and valued.

In order for the United States to maintain an educated workforce, new, promising, teacher-friendly, research-based strategies must be identified to capture the attention and imagination of a generation that is currently marginalized, but that will soon serve as the nation's

leadership. Researchers (Bottiani et al., 2018; Trotman Scott & Moss-Bouldin, 2014) have agreed that a different approach is needed to ensure that African-American students have access to educational opportunities that are equal to their White counterparts. Culturally relevant pedagogy, as defined by Gloria Ladson-Billings (1995) is the inclusion of the culture of the student to facilitate academic success. African-American students need specific help to close the gap.

Culturally responsive pedagogy is an appropriate response to the mismatch between African-American student's home culture and school culture. However, complications arise due to the concurrent mediating effects of poverty on student academic achievement and motivation at Urban Middle School. Therefore, new preventative classroom teaching techniques are required to bridge the divide and eventually close the achievement gap. Bottiani et al. (2018) asserted that the better course of action is for teachers to proactively eliminate racial and cultural barriers versus reactively responding to racially influenced issues in the classroom.

Changing teachers' approaches to engagement strategies could address the needs of African-American middle-school students from low-socioeconomic-status backgrounds. Increased engagement could help prevent disciplinary issues and increase learning. Students who are fully immersed in the curriculum on a daily basis do not have time to cause classroom disruptions, so an engaged student is less likely to cause disciplinary problems. However, student motivation is a nebulous hurdle for teachers.

Also, African-American students from low-socioeconomic-status households have additional unique challenges that need to be addressed in their curricula. According to Dell'Angelo (2016), a direct correlation exists between high poverty and low student success on standardized tests. The author went on to say that Hispanic and African-American students are

disproportionately affected by poverty. Researchers have also found that the time frame during which a student lives in poverty affects the severity of the impact, with middle-school students being more adversely impacted than older adolescents (Duncan et al., 1998). Jensen (2013) similarly reported that poverty adversely affects student effort and motivation, asserting that students in poverty are more likely to display symptoms of learned helplessness and depression, but that effective teachers can positively impact student effort. Student motivation and engagement strategies for African-American students from low-income households must be customized to the demographic to be effective. Intervention strategies must be culturally relevant, as well as provide students from low-socioeconomic-status households the support they need in the classroom.

Therefore, as Hale (2016) suggests, it is incumbent upon classroom teachers to create environments where students learn how to be motivated and engaged in learning. Additionally, Jensen (2013) recommended that teachers of students in poverty emphasize the characteristics of a growth mindset to increase student engagement. A new, promising approach that could possibly encompass both African-American culturally responsive techniques and provide opportunities for students in poverty to develop socioemotional fortitude is gamification. Increasing student engagement for African-American students could help increase learning and reduce behavioral issues in the classroom.

Student engagement can be addressed in the classroom in many ways. Davis and Forbes (2016) admonished that interventions to increase student motivation and engagement must be strategic and purposeful. According to van Roy & Zaman (2018), student motivation is highly touted as one of the key principles driving student success and is positively correlated with student achievement (Herges et al., 2017). There is no doubt that it is vital for teachers to

increase engagement for African-American middle-school students from low-socioeconomic-status households. Multiple approaches to motivation need to be examined and researched in order to develop effective interventions based on the literature.

Alignment with Action Research Traditions

The goal of this study was to improve educational practice at Urban Middle School. This study was conducted in the action research tradition as defined by Anderson et al. (2007). The study was conducted by a researcher-practitioner with the goal of improving practice at a particular site only. The results of this research will be utilized only to inform a local problem, specifically, the issue of student disengagement among African-American seventh- and eighth-grade students at Urban Middle School. The results will not be generalized to other contexts.

The resulting artifact (Appendix A) is a gamification implementation guide to assist teachers at Urban Middle School in using the strategies that were found in this study to successfully engage and motivate students. Landers et al. (2018) recommended that the scientist-practitioner is best positioned to develop effective gamification intervention aligned with the action research model. The gamification process can be time-consuming and require multiple attempts to fine-tune the processes. Additionally, researchers have implied that educators make poor game designers (Kapp, 2012; Theodosiou & Karasavvidis, 2015). Therefore, my goal was to save teachers time by creating a simple list of recommendations so that they can learn from my successes and failures and have clear guidance as they weave gamification into their classroom instruction.

I determined gamification recommendations for Urban Middle School based on the current literature about student engagement and motivation, further saving teachers the effort of researching and compiling information. Specifically, the intervention recommendations focus on

incorporating cooperative groups and using a leaderboard to track team points. The recommendations included in the guide were created according to what I discovered in the literature and were refined by how the students responded during implementation. I will also present my findings to Urban Middle School stakeholders.

Quantitative data analysis was used to gauge the effects of gamification on student engagement. My comparative research question was as follows: What are the differences in student engagement before gamification intervention and after gamification intervention? The SEI presented by Appleton et al. (2006) measures six different dimensions of student engagement. I conducted a pre-experimental, one-group, pretest-posttest design as defined by Creswell (2014) to yield data that will aid the administration at Urban Middle School in deciding whether gamification could be helpful in increasing student engagement.

Conceptual Framework

Engagement may be reduced by the effects of poverty, such as low parent expectations for grades (daFonseca, 2014). Additionally, students may have trouble developing a growth mindset given these poverty factors (Claro, et al., n.d.). Students' low motivation and engagement levels result in low student effort and, consequently, lower grades. Also, students who struggle to embrace a growth mindset are more resistant to teacher encouragement, providing less opportunities to deepen learning with more rigorous content. I endeavored to increase student engagement and motivation through gamification (Herges et al., 2017), specifically the use of a leaderboard to track points, the use of teams, and the inclusion of weekly team challenges. The resulting artifact from this study (Appendix A) is a gamification guide to assist other teachers at Urban Middle School in using the strategies found to successfully engage African-American students. The activities included in the guide were created according to what

I discovered in the literature and were refined by how the students responded during implementation.

Theoretical Framework

This research was grounded in the self-determination theory as defined by Ryan and Deci (2017) and informed by culturally responsive pedagogy (Ladson-Billings, 1995). Self-determination theory as summarized by Edward Deci (The Brainwaves Video Anthology, 2017) consists of two main components—types of motivation and basic human psychological needs required for self-motivation and engagement. Deci explained that two overarching types of motivation exist—autonomous motivation and controlled motivation. Autonomous motivation is defined as the completion of tasks and activities that bring a person joy. Controlled motivation means performing a task or activity because of fear of punishment or fear of missing out on a reward of some type. Additionally, Ryan and Deci (2017) outlined three basic human psychological needs that support engagement and motivation—competence, autonomy, and relatedness. Competence is one’s belief that they are capable and able to affect positive change in their environment. Autonomy is a person’s freedom to choose their activity or course. Relatedness refers to the two-way feeling of being connected and connecting with others.

Another model I draw on is culturally relevant pedagogy. Ladson-Billings (1995) describes three tenets of culturally relevant pedagogy, which are academic success, cultural competence, and critical consciousness. To ensure the academic success of African-American students, Ladson-Billings (1995) advocates that teachers insist students develop a deep working knowledge of the curriculum and increase students’ confidence in their knowledge and abilities. Cultural competence is the teachers’ purposeful infusion of the students’ home and community lives into daily teaching so that school is a seamless support for their growth (Ladson-Billings,

1995). Critical consciousness is the teacher creating a classroom environment that supports students' growth into informed citizens, encouraging students to become active participants in the improvement of the world around them in self-directed ways (Ladson-Billings, 1995).

Ladson-Billings' model directly aligns with Ryan and Deci's (2017) basic needs for motivation as defined in their self-determination theory. Culturally responsive pedagogy require that teachers set high standards for academic success and give students the necessary scaffolds to reach those goals (Ladson-Billings, 1995), which directly aligns to the self-determination theory's tenet of competence (Ryan & Deci, 2017). Ladson-Billings (1995) found that culturally responsive pedagogy requires that teachers include perspectives of cultural competence, integrating relevant aspects of students' community lives into the class curricula, which speaks to Ryan & Deci's (2017) discovery that relatedness is essential for motivation. Lastly, Ladson-Billings (1995) asserts that culturally responsive teachers guide students towards critical consciousness by creating an environment that supports the personal social justice causes of their students and helps develop critical problem-solving skills that the students then apply to their community. This tenet of culturally responsive pedagogy aligns directly with Ryan and Deci's (2017) third requirement for human motivation, autonomy. Theoretically, the incorporation of culturally responsive pedagogy may encourage student motivation and engagement for African-American students.

Additionally, Lawson and Lawson (2013) theorized these different emotional requirements for engagement as the "social ecology of engagement." The authors believed that engagement is best measured in multiple dimensions, including peer relationships, family support, and activities outside of the classroom. Both theories are realized in the SEI (Appleton et al., 2006), the survey tool employed for this study. The six dimensions of the SEI align

directly with Ryan's and Deci's (2017) three basic needs for engagement and motivation. Citing the self-determination theory, my gamification intervention endeavored specifically to increase students' feelings of relatedness covered by two of the SEI domains—teacher-student relationships and peer connections. Additionally, the gamification activities sought to increase students' feelings of competence as described by Ryan and Deci (2017) through the SEI domain of students' belief in the relevance of their coursework. Therefore, my research questions directly aligned with the self-determination theory, substantiating the effect had by gamification on engagement in my classroom.

Most Significant Research and Practice Studies

Student engagement is defined as “the quality of a student’s connection or involvement with the endeavor of schooling and hence with the people, activities, goals, values, and place that compose it.” (Skinner et al., 2009, p. 494). According to the literature, engagement can be influenced by the teacher (Lawson & Lawson, 2013; Skinner et al., 2009). Because engagement can be influenced, then, increasing student engagement is within the locus of control of a classroom teacher. Student boredom can create resentment and decrease learning (Kapp, 2012). Archambault et al. (2009) found that high student engagement decreases dropout rate. Therefore, increasing student engagement may be an easily accessible way for teachers to directly impact the academic success of their students.

Effectiveness of Extrinsic and Intrinsic Motivations

The leading voices in the research of motivation and engagement are Richard Ryan and Edward Deci (Bolkan, 2015; Lawson & Lawson, 2013; Skinner et al., 2009). The research duo has worked together and individually for more than 40 years testing and analyzing human motivation and its components (The Brainwaves Video Anthology, 2017). Ryan's and Deci's

(2017) most well-known contribution to the study of motivation is the self-motivation theory.

As explained above as part of my theoretical framework, the self-determination theory consists of two main components—types of motivation and basic human psychological needs required for self-motivation and engagement. Deci (The Brainwaves Video Anthology, 2017) explained that two overarching types of motivation exist—autonomous motivation and controlled motivation. Autonomous motivation is analogous to intrinsic motivation in that the person completes the activity because of their own volition and positive emotions attached to the process. Controlled motivation is analogous to extrinsic motivation with performance being determined by the reaction to it, be it a positive reaction (e.g., a reward, praise, etc.) or a negative reaction (e.g., a low grade, scolding, etc.).

Nix et al. (1999) set out to prove that the type of motivation for an activity affects a person's level of energy upon successful completion of the task. The researchers discovered that the type of motivation for success at an activity, whether intrinsic or extrinsic, does not affect the level of joy derived by the subject from successful completion of the task. However, when the study subjects were extrinsically motivated, a statistically significant number of participants reported feeling less energized. Although the participants reported similar levels of happiness upon task completion, these findings from the work of Nix et al. (1999) support the theory that the type of motivation does have psychological and physiological effects on humans.

Additionally, Ryan and Deci (2017) outlined three basic human psychological needs that support engagement and motivation—competence, autonomy, and relatedness. Competence is one's belief that they are capable and able to affect positive change in their environment. Autonomy is a person's freedom to choose their activity or course. Relatedness refers to the two-way feeling of being connected and connecting with others. Ryan and Deci (2000)

postulated that when these three needs are met, intrinsic motivation increases. Conversely, when any of these three needs is neglected, self-motivation decreases.

Motivation and engagement are highly correlated. Extrinsic motivation has traditionally been less desirable in academic settings and typically has a negative connotation. Gillet et al. (2012) defined extrinsic motivation as occurring when a person accomplishes a task to gain some type of reward or benefit. Although the literature has said that extrinsic motivation is typically ineffective in improving learning outcomes (Gillet et al., 2012; Ryan & Deci, 2017), Herges et al. (2017) reported that students themselves view extrinsic motivation as being positively correlated to improved academic performance. Additionally, Herges et al. (2017) surmised that extrinsic motivation (such as competition) may be more effective with middle-school students.

Intrinsic motivation is often hailed as the gold standard for educators, but it is often hard to nurture in adolescents. Gillet et al. (2012) defined intrinsic motivation as occurring when a person moves from inside of themselves to accomplish a task of their own accord. Deci et al. (1991) positively correlated intrinsic motivation to student achievement; however, intrinsic motivation decreases over the span of the school-aged years, with the decline most pronounced between third and ninth grades (Gillet et al., 2012). However, Deci et al. (1991) and Gillet et al. (2012) also found that teaching that supports student autonomy counteracts the negative effects of age regarding intrinsic motivation. Per Herges et al. (2017), hands-on activities, teaching in thematic units, and incorporating problem-based learning all encourage intrinsic motivation. According to van Roy and Zaman (2018), student motivation is highly touted as one of the key principles driving student success and is positively correlated to student achievement (Herges et al., 2017).

There is no doubt that it is vital for teachers to increase motivation and engagement for African-American middle-school students from low-socioeconomic-status households. This research focused on improving motivation and engagement through gamification, measured by three indicators on the SEI presented by Appleton et al. (2006)—specifically, teacher-student relationships, peer connections, and students’ belief in the relevance of their work.

The Impact of Teacher-Student Relationships on Student Engagement

Positive teacher-student relationships can impact student engagement. According to a meta-analysis of 92 studies by Roorda et al. (2011), positive teacher-student relationships are more impactful to engagement for secondary students than for primary students. Additionally, special populations of students (students from households of low socioeconomic status, students with disabilities, etc.) benefit more from positive teacher-student relationships than normative students. Therefore, improving student responses for this indicator of engagement could have a multilayered effect on student engagement.

Roorda et al. (2017) conducted a meta-analysis of 189 different studies on the relationship between student engagement, student achievement, and teacher-student relationships. The authors reported that positive teacher-student relationships increase student engagement and, thus, impact achievement. Although the authors reported that secondary-school students depend more on support from peers than support from teachers (Gillet et al., 2012; Roorda et al., 2017), they also stated that secondary-school teacher-student relationships are less intimate than elementary-school teacher-student relationships. Therefore, if positive teacher-student relationships equal higher engagement, improving teacher-student relationships is a worthy aspiration of this study.

Froiland et al. (2019) posited that positive teacher-student relationships support all three psychological needs for motivation as defined by Ryan’s and Deci’s (2017) self-determination theory—autonomy, relatedness, and competence. Froiland et al. (2019) found a positive association between positive teacher-student relationships and happiness for sample groups of all ethnicities. Hence, improving teacher-student relationships for African-American middle-school students could have the added benefit of adding more joy to the school day for these students.

The Impact of Students’ Belief in the Relevance of Their Work on Student Engagement

The presented gamification intervention aligns with the SEI indicator of students’ belief in the relevance of their work. According to Evans and Boucher (2015), empowering students by giving them the ability to choose curricular activities when possible improves student motivation. The authors also mentioned that students from racial minority groups and low-socioeconomic-status households are less likely to be offered choices for their classroom activities. Also, Cooper (2014) discovered that student-focused classrooms have higher levels of engagement. Students’ buy-in to classwork is a crucial component for increasing engagement. Additionally, Ryan and Deci (2017) described competence as a basic need that must be met in order to improve student motivation and engagement.

The Impact of Positive Peer Connections on Student Engagement

The gamification intervention in this study also endeavored to increase the positive peer connections indicator-of-engagement scores on the SEI for the African-American students in my classes. Group contingency was defined by Maggin et al. (2017) as “circumstances in which students receive a predetermined preference item or activity contingent on the behavior of one or more students in a group” (p. 353). Group contingency is a long-standing classroom management tool used often by educators. For example, Tingstrom et al. (2006) meta-analyzed

33 years of literature written about the Good Behavior Game and all of its different iterations using group contingency in the classroom.

A sense of relatedness and connectedness is essential for every student, but especially for African-American students. Akua (2020) outlined 13 standards of Afrocentric education upon which schools and communities can build high-quality, culturally relevant educational opportunities for African-American students. Standard 3 of 13 states that many African cultures place high value on family and community, so these values should be applied to the classroom. Standard 7 of 13 recommends cooperative learning as a method that mirrors the African-American sense of community. Brittian and Gray (2014) also discovered that, for African-American middle-school students, positive connections to their peers serves as a social buffer and helps mitigate the effects of racial discrimination from their teachers.

Additionally, Way and Chen (2000) studied the particular friendship styles of African-American students. According to Way and Chen (2000), African-American students are more likely to have friendship groups outside of school than White students. African-American students would, therefore, benefit from an intervention that encourages positive peer connections with their classmates. Subsequently, if feelings of relatedness as described by Ryan and Deci (2017) improve, then the students' engagement and motivation would theoretically increase as well. Therefore, given the findings of Akua (2020) and Way and Chen (2000), the use of group-based contingency / cooperative grouping in this gamification intervention could be viewed as a form of culturally responsive pedagogy as defined by Ladson-Billings (1995).

Gamification and Its Implications

The use of games to teach important concepts has been around for millennia (Deterding et al., 2011). The term "game" can be defined as a series of interactions (Kapp, 2012), mostly

used to induce play and increase entertainment. Eventually, technological developments merged with game concepts and video games went mainstream, giving birth to gamification science and game design science in the early 2000s (Deterding et al., 2011). Today, game design scientists utilize core elements to attract players and entice them to play for as long as possible (Landers et al., 2018). Gamification science is a standalone subset of game design science. The two sciences differ in their intended outcomes. Gamification scientists strive to improve behaviors, dispositions, or outcomes by using key elements of games and video games (Deterding et al., 2011; Landers et al., 2018).

Although neither game design scientists nor gamification scientists have come to a complete consensus on the nomenclature, these key elements of play are called game mechanics (Kapp, 2012; Dicheva et al., 2015) or game elements (Deterding et al., 2011; Kapp, 2012; Landers et al., 2018). According to Dicheva et al. (2015), examples of game mechanics include the use of immediate feedback, personalization of the experience through choice, cooperation and competition, visible progress, and the ability to unlock different levels. Each game mechanic has a unique purpose. For example, leaderboards are used to increase motivation by making progress and victories visible to participants (Landers et al., 2018). The use of cooperative teams creates positive peer pressure toward socially acceptable behaviors (Groves & Austin, 2019). Game design scientists and gamification scientists use the elements as standalone items or in conjunction with each other to create highly sophisticated systems (Deterding et al., 2011; Dicheva et al., 2015; Landers et al., 2018).

With the first commercially successful video game, industry leaders and educators began to seek ways to harness the power of video games to support growth metrics and learning objectives, giving birth to gamification science, or the study of adding game-like elements to a

given task to make it more engaging (Deterding et al., 2011). Gamification is a subset of game design that differs from the latter in its focus on intended outcomes (Landers et al., 2018). Gamification is more influenced by the field of human-computer interactions and the social sciences (Deterding et al., 2011; Landers et al., 2018). Familiar examples include loyalty programs at grocery stores and the visible progress bar that can be seen on many computer applications and surveys (Dicheva et al., 2015).

Although gamification is a relatively new term (coined in 2008), the concept did not gain traction in the area of research until 2010 (Deterding et al., 2011). Since then, researchers have made some clarifying distinctions in terminology. Gamification, or the deployment of video-game strategies to nongame applications (Caponetto et al., 2014; Cassells et al., 2015; Deterding et al., 2011; Dicheva et al., 2015; Kapp, 2012), differs from games-based learning in that games-based learning is defined as using games to convey particular concepts (Caponetto et al., 2014). Gamification is a design process (Landers, 2019) that requires educators to utilize game mechanics, such as competition, goals, a progress bar, and low-stakes challenges, to construct learning experiences (Dicheva et al., 2015). This is the definition of gamification used throughout this work.

Gamification also differs from educational video games, also known as “serious games” because gamification does not necessarily mean the creation of an electronic game (Deterding et al., 2011; Dicheva et al., 2015). It is the application of video-game concepts to ordinary tasks to increase engagement. Additionally, gamification does not necessarily aim to increase enjoyment or entertainment derived from a task, but gamification does aim to improve outcomes (Landers et al., 2018). Furthermore, “gameful design” is a subset of gamification that aims to make a task or event feel like a game, whereas gamification is a broader concept that endeavors to increase

outcomes but may or may not make the task feel like a game (Deterding et al., 2011; Landers et al., 2018). The gamification intervention I designed would be considered gameful design because the goal was to increase engagement by making classwork feel more like a game with the addition of two game mechanics—a leaderboard and cooperative teams.

Although the term gamification is relatively new, the concept of gamification has long been used in practical applications. For example, most military branches incentivize members to level up to higher ranks, earning more badges (Dicheva et al., 2015). One of the most researched gamification approaches, the Good Behavior Game created in 1969 (Tingstrom et al., 2006), has been used in a variety of contexts by teachers. The Good Behavior Game uses the game mechanics of a visible leaderboard and cooperative teams to improve classroom behavior for students. Groves and Austin (2019) discovered that the Good Behavior Game positively affects students' relationships with their peers. Specifically, studies have been performed with the Good Behavior Game for intervention with elementary-aged students, students with disabilities, and students with behavioral challenges to increase positive classroom behavior (Joslyn et al., 2019; Tingstrom et al., 2006). However, a search engine query for “Good Behavior Game” and “African-American” or “Black students” yields no results. My gamification intervention was influenced by the Good Behavior Game with the use of a leaderboard and cooperative teams. It was unique, though, because I included bonus team challenges and because my target audience was African-American middle-school students from low-socioeconomic-status households—essentially what Joslyn et al. (2019) would deem a “novel population” (p. 811).

Because games and video games excel at keeping players engaged (Deterding et al., 2011; Dicheva et al., 2015; Kapp, 2012;), I hypothesized that introducing video game-like elements, or game mechanics, to my teaching would increase engagement for my middle-school

students. Although a cooperative effort from both teachers and technical experts is needed to create an effective educational game, educators make poor game designers because the process is so complex (Kapp, 2012; Theodosiou & Karasavvidis, 2015), so I endeavored to keep implementation simple and replicable. Specifically, I employed the specific game mechanics of a leaderboard and team competition. Gamification could address many of the cultural and developmental needs embodied by African-American middle-school students from low-socioeconomic-status backgrounds at Urban Middle School. These game mechanics would be familiar to Urban Middle School students and most adults who have experience with playing video games. For this intervention, I chose to use a leaderboard and cooperative teams because these 2 game mechanics are fairly easy to incorporate into existing curricula.

Gamification is a novel approach to engaging students in the classroom that utilizes a variety of motivational approaches to encourage students to connect with the learning happening in the classroom. The use of game mechanics in the classroom goes back many decades. Dicheva et al. (2015) suggested that more research is required around single game mechanics and the effectiveness of these mechanics with particular audiences. For example, ERIC database and Google Scholar searches yield zero results that include “gamification” and “African-American students” in the title. The concept of gamification is currently creating a buzz in the education realm as teachers seek out answers to the question of engagement, but more research is required to hone in on the most effective applications of the concepts with specific audiences.

Closing Thoughts on Chapter II

In this study, I endeavored to utilize these research findings about the pedagogical preferences of African-American students, the suggested interventions for students in poverty, and the needs of the middle-school brain to positively impact the motivation and engagement of

the seventh- and eighth-grade students whom I teach at Urban Middle School. Historically, many Urban Middle School students consider earning a 70% on an assignment as the standard instead of working toward their full potential. According to the spring 2019 Metropolitan ISD Student Experience Survey, Urban Middle School scored 62% favorable responses for the student engagement domain. Additionally, 92.4% of students are categorized as low-socioeconomic-status, so motivation may be reduced by the effects of poverty, such as low parent expectations for grades. Additionally, students may have trouble developing a growth mindset given these poverty factors. Students' low motivation levels result in low student effort and, consequently, lower grades. Also, students who struggle to embrace a growth mindset are more resistant to teacher encouragement, providing less opportunities to deepen learning with more rigorous content. I endeavored to increase student engagement and motivation through the following intrinsic and extrinsic interventions: gamification, team activities, routine progress monitoring, and student/teacher reflections.

CHAPTER III

SOLUTION AND METHOD

Proposed Solution

Urban Middle School students struggle with focus and engagement during class time. According to the spring 2019 Metropolitan ISD Student Experience Survey, Urban Middle School scored 62% favorable responses for the student engagement domain. This lack of engagement may be attributable to many factors, and current conditions at the school do not suggest that student engagement will improve without intervention. For the 2019–2020 school year, half of the school administrative staff was new to campus, and 63% of teaching positions were either vacant or filled by teachers new to campus. This lack of teaching consistency has contributed to student apathy in class. Seventy percent of Urban Middle School students are classified as at-risk, 72% are African American, 24% are Hispanic, and 98.7% are categorized as low-socioeconomic-status. Additionally, according to Metropolitan ISD data, Urban High School, which serves as the only high school to which middle and elementary schools feed in the district, had 5% of 2018 seniors meet college-readiness standards on the ACT/SAT. If Urban Middle School students do not have a firm academic foundation established at the middle grade levels, replete with the habit of engaging fully in class, their chances of graduating college-ready will be even slimmer.

The presented intervention is the implementation of gamification or the application of video-game mechanics to non-video-game environments (Caponetto et al., 2014; Cassells et al., 2015; Dicheva et al., 2015) with the students in six sections of my Investigating Careers course. Specifically, the presented intervention employed the use of cooperative teams

competing for points earned by task completion. Additionally, team point totals were tracked on a visible leaderboard.

Figures 1 to 4 show the class leaderboard at the conclusion of the gamification intervention. Teams earned points by completing classwork assignments and by winning fun team challenges. The background of the leaderboard was composed of sheets of 1-in. grid paper. The names of the teams were listed along the x-axis of the board (see Figure 1). The teams were grouped according to their class period so that students could easily see which team in their class was in the lead at any given time. I colored in one square for each point earned by a team. The leaderboard featured a color-coded key so that students could see at a glance how they earned their squares (see Figure 2). Teams that won a class challenge earned three squares, second-place teams earned two squares, and all other teams that at least attempted the challenge earned one square. When students asked why another team had more points than theirs, I could easily look and see which color squares the team had. For example, if a team had three pink squares, then that meant that they had won the Chopstick Challenge (teams used chopsticks to place as many plastic pieces of food on their plate as possible in 1 min). Or if a team was missing a green classwork square, then that meant that not all of the teammates had completed their classwork on a specific day. Additionally, a brief overview of the game instructions was included on the board (see Figure 3). In the vein of the classic racing game genre (Tekinbaş & Zimmerman, 2004), the team with the most squares colored in by the last day of play won the game. I hosted a private pizza party for the two students from the winning team who came to school on that Friday. The winning team was allowed to choose the date of the celebration. The winning teams from each class received a bag of chips for each team member. Additionally, the winning teams were allowed to use rolling chairs during their time in class instead of their regular stationary chairs.

At the end of the game, all of the winning teams from each class, as well as the overall winning team, were noted and celebrated on the leaderboard (see Figure 4).

Figure 1

Leaderboard Posted in Class Displaying Team Names on the x-Axis



Figure 2

Color-Coded Key on Leaderboard



Figure 3

Brief Overview of the Game Rules on the Leaderboard

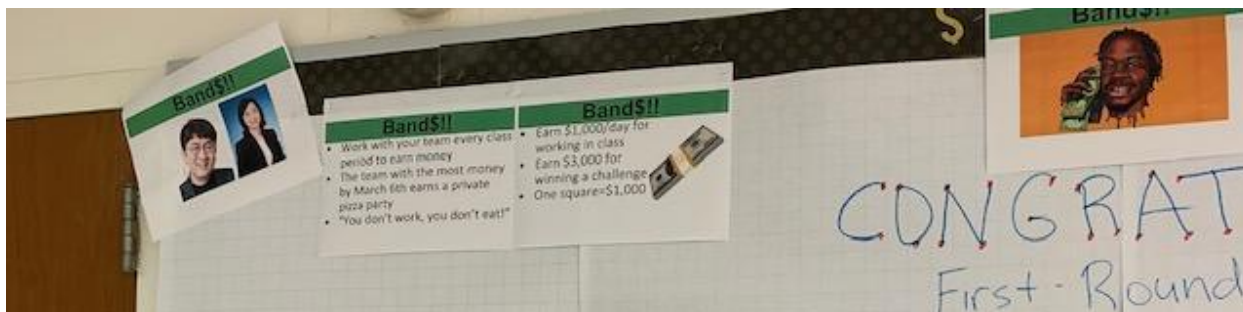
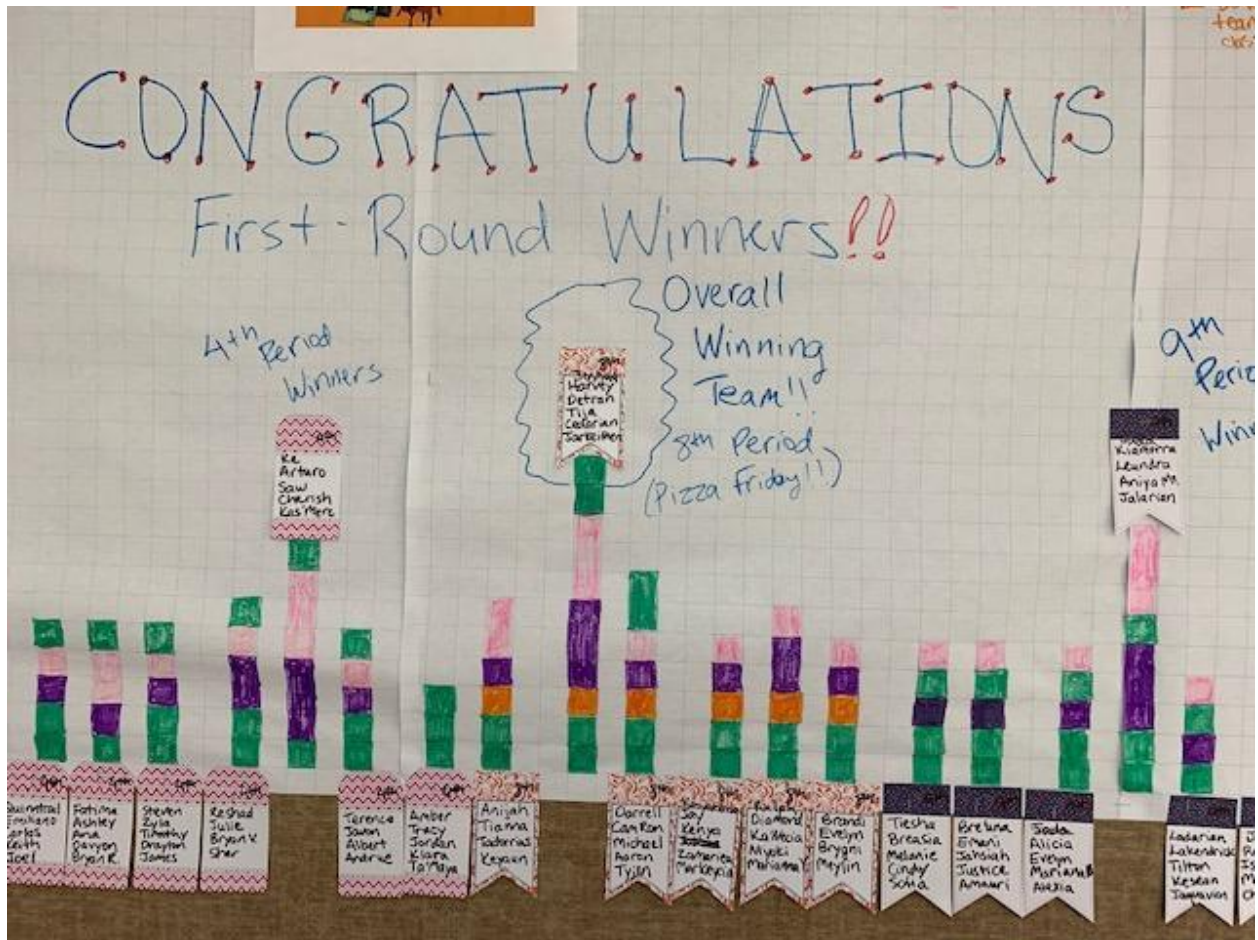


Figure 4

Leaderboard Celebration of Winning Teams



This intervention was constructed on extant tenets of engagement as defined in the literature, namely, that pedagogy and other interventions can increase engagement (Lawson & Lawson, 2013). Gamification is not currently used in any classroom at Urban Middle School, so this intervention could possibly provide an additional, non-content-specific tool for teachers to use to increase engagement. This study was conducted in the action research tradition as defined by Anderson et al. (2007). The study was conducted by a researcher-practitioner with the goal of improving practice at one particular site only. The results of this research will be utilized only to inform a local problem, specifically, the issue of student disengagement among African-

American seventh- and eighth-grade students at Urban Middle School. The results will not be generalized to other contexts.

The gamification intervention seamlessly coexisted with established instructional requirements because the game mechanics were implemented in addition to the curriculum, not in lieu of the curriculum. Students in the Investigating Careers classes continued to learn the coursework content mandated by the district, which aligns with the Texas Essential Knowledge and Skills (TEKS) standards. Additionally, students worked in teams and earned points when all members of their team completed classwork assignments. Teams could also choose to compete in weekly challenges to earn extra points and increase team morale. The research employed a researcher-practitioner design, allowing for flexibility and fidelity in implementation but raising concerns about validity with regard to generalizing the study findings.

Justification of Proposed Solution

Gamification is a novel approach to engaging students in the classroom that utilizes a variety of motivational approaches to encourage students to connect with the learning happening in the classroom. According to Dicheva et al. (2015), examples of game mechanics include the use of immediate feedback, personalization of the experience through choice, cooperation and competition, visible progress, and the ability to unlock different levels. These game mechanics would be familiar to Urban Middle School students and most adults who have experience with playing video games. The use of game mechanics in the classroom goes back many decades. One of the most researched gamification approaches, the Good Behavior Game created in 1969 (Tingstrom et al., 2006), has been used in a variety of contexts by teachers. This treatment applies the specific game mechanics of a leaderboard and cooperative teams to the middle-school context. However, the use of only specific game mechanics with middle-school students was

cited by Dicheva et al. (2015) as an area of future research for gamification. Therefore, this pre-experimental, pretest-posttest treatment establishes the effects of these game mechanics on African-American student engagement at Urban Middle School.

Additionally, all Metropolitan ISD middle-school teachers are evaluated on multiple measures each school year to determine their effectiveness level. In Metropolitan ISD, effectiveness level determines teacher pay. One of these multiple measures is a Student Experience Survey, which asks random students questions about the classroom culture and learning experiences in a teacher's classroom. Several of the questions on the student survey are connected to student engagement and align with several of the questions on the SEI (Appleton et al., 2006). The presented intervention could possibly increase student engagement and aid teachers in increasing their Student Experience Survey scores for their annual appraisal.

Study Context and Participants

Participants and Sample

The seventh- and eighth-grade students in my Investigating Careers course in six different sections participated in the execution of a pre-experimental, one-group, pretest-posttest action research design without random assignment. A total of 150 students took the SEI pretest, 63% being African American, 43% being Hispanic, and 11% being another ethnicity. Participants of the pretest were nearly evenly split by gender, with 51% being female and 49% being male. A total of 143 students took the SEI posttest, 64% being African American, 26% being Hispanic, and 10% being another ethnicity, with the population being exactly half female and half male. As shown on Table 1, the sample sizes were different but representative of mostly the same students in each group, so I utilized the overlapping-samples *t* test to draw comparisons between pretest and posttest data.

Table 1*Study Participants*

Student Profile	Pretest (n = 150)		Posttest (n = 143)	
African American	94	63%	91	64%
Hispanic / Latino/a	65	43%	37	26%
Other	17	11%	15	10%
Female	77	51%	72	50%
Male	73	49%	71	50%

Because the data will not be used to generalize the effectiveness across contexts, the one-group design was selected over a control-group design. The purpose of the research was to measure changes in students' self-reported levels of engagement. Additionally, I served as the only teacher implementing the study design, so it would have been difficult for me to implement the treatment while simultaneously remaining neutral in administering the control over the limited time period. Plus, all students benefited from higher levels of engagement mid-spring semester. The time constraints of the study did not allow me to run the intervention with students in a control group before the beginning of high-stakes testing. These contextual constraints and time limitations justified the one-group design without random assignment. I drew conclusions using these data only regarding the relevance of the use of gamification at Urban Middle School with seventh- and eighth-grade students and did not attempt to generalize the findings to any other context.

Urban Middle School administrators collaborated in identifying the problem and developing the intervention. To preserve the anonymity of students, gender, ethnicity, and grade were the only demographic identifiers collected in order to make comparisons between grade levels, genders, and ethnicities. All stakeholders understood that the goal of data collection was to improve student engagement at Urban Middle School.

Research Paradigm

Urban Middle School students struggle with focus and engagement during class time. According to the spring 2019 Metropolitan ISD Student Experience Survey, Urban Middle School scored 62% favorable responses for the student engagement domain. Therefore, the seventh- and eighth-grade students in my Investigating Careers class during the spring semester of the 2019–2020 school year participated in this quantitative study, which was designed to assess the effects of gamification on student engagement. The intervention was based on applying video-game mechanics to the middle-school classroom. The basis for attempting to apply game mechanics in the classroom to increase engagement was grounded in the tenets of extant literature, namely, that pedagogy and other interventions can increase engagement (Lawson & Lawson, 2013). Development of the treatment was also informed by research on the teenage brain, research on the needs of African-American students, and research on intrinsic/extrinsic motivation approaches. Additionally, informal student input from 2018–2019 eighth-grade students who participated in gamification was used to refine the intervention, along with anecdotal evidence that I have collected from running informal gamification for 4 years prior to the intervention.

Because the intent of the research was to assess the effectiveness of gamification in increasing student engagement, a pre-experimental, one-group, pretest-posttest design as defined by Creswell (2014) was utilized to yield data that will aid the administration at Urban Middle School in deciding whether gamification could be helpful in increasing student engagement. Quantitative data analysis was used to gauge the effects of gamification on student engagement. My comparative research question was as follows: What are the differences in student engagement before gamification intervention and after gamification intervention? The SEI

presented by Appleton et al. (2006) measures six different dimensions of student engagement. I conducted a pre-experimental, one-group, pretest-posttest design as defined by Creswell (2014) to determine if the use of a leaderboard and student teams increases student engagement in three of the six dimensions—teacher-student relationships, students’ belief in the relevance of their coursework, and peer connections. The following are three subresearch questions addressed in this study: (1) What are the differences in the student engagement indicator scores of teacher-student relationships before gamification intervention and after gamification intervention? (2) Does implementing gamification increase students’ belief in the relevance of their work? (3) Does implementing gamification increase peer connections?

The data yielded can aid the administration at Urban Middle School in deciding whether gamification could be helpful in increasing student engagement in other classes as well. The data from the pretests and posttests were analyzed using an overlapping-samples *t*-test design. According to Urdan (2017), a *t* test is applied to compare pretest and posttest data to assess changes in the results. This quantitative data analysis will guide the administrators of Urban Middle School as they seek solutions to offer their teachers for the purpose of increasing student engagement.

Data Collection Methods

Data Sources and Analysis Strategy

Data collection was limited to one classroom at one school, Urban Middle School in Metropolitan ISD. The pretest-posttest data collection method without random assignment was chosen as the least intrusive approach to assessing the effects of gamification on student engagement. The aim was to allow as many seventh- and eighth-grade students as possible to participate in the intervention because the gamification strategies could prove beneficial to the

students. Additionally, the SEI (Appleton et al., 2006) is a targeted survey tool that offers solid baseline data and captures shifts in student attitudes postintervention. The SEI has been in use since 2006 (Appleton et al., 2006) and is the subject of multiple peer-reviewed academic journal articles, adding to its validity. Additionally, Landers et al. (2018) suggested that one way to ensure the rigor of research on gamification science is to use scientifically validated measurement instruments such as the SEI.

The 35-question SEI designed by Appleton et al. (2006) was used as the pretest and posttest survey instrument. Survey items, shown in Table 2, were rated on a four-point Likert-type scale ranging from “strongly agree” (1) to “strongly disagree” (4). Urban Middle School students are familiar with this type of survey item because a similar Likert-type scale is used on the annual Metropolitan ISD Student Experience Survey. Appleton et al. (2006) and Lovelace et al. (2014) suggested that the tool be used with middle- and high-school students, so the survey tool was age-appropriate for the seventh- and eighth-grade students at Urban Middle School. In alignment with assertions from Lawson and Lawson (2013) that student engagement is a multifaceted condition, the SEI assesses engagement in six separate dimensions to gather a more complete picture of the student’s frame of mind. These six dimensions include teacher-student relationships, control and relevance of work, peer support for learning, future aspirations and goals, family support for learning, and extrinsic motivation. The rules and activities associated with my gamification intervention aligned directly with three of the domains—teacher-student relationships, control and relevance of work, and peer support for learning (see Appendix B for details).

Table 2

SEI Survey Questions (Appleton et al., 2006)

Dimension 1: Teacher-Student Relationships

1. Overall, adults at my school treat students fairly.
2. Adults at my school listen to the students.
3. At my school, teachers care about students.
4. My teachers are there for me when I need them.
5. The school rules are fair.
6. Overall, my teachers are open and honest with me.
7. I enjoy talking to the teachers here.
8. I feel safe at school.
9. Most teachers at my school are interested in me as a person, not just as a student.

Dimension 2: Control and Relevance of Schoolwork

10. The tests in my classes do a good job of measuring what I'm able to do.
11. Most of what is important to know you learn in school.
12. The grades in my classes do a good job of measuring what I'm able to do.
13. What I'm learning in my classes will be important in my future.
14. After finishing my schoolwork, I check it over to see if it's correct.
15. When I do schoolwork, I check to see whether I understand what I'm doing.
16. Learning is fun because I get better at something.
17. When I do well in school it's because I work hard.
18. I feel like I have a say about what happens to me at school.

Dimension 3: Peer Support for Learning

19. Other students at school care about me.
20. Students at my school are there for me when I need them.
21. Other students here like me the way I am.
22. I enjoy talking to the students here.
23. Students here respect what I have to say.
24. I have some friends at school.

Dimension 4: Future Aspirations and Goals

25. I plan to continue my education following high school.
26. Going to school after high school is important.
27. School is important for achieving my future goals.
28. My education will create many future opportunities for me.
29. I am hopeful about my future.

Dimension 5: Family Support for Learning

30. My family/guardian(s) are there for me when I need them.
31. When I have problems at school my family/guardian(s) are willing to help me.
32. When something good happens at school, my family/guardian(s) want to know about it.
33. My family/guardian(s) want me to keep trying when things are tough at school.

Dimension 6: Extrinsic Motivation

34. I'll learn, but only if my family/guardians give me a reward. (*Reversed*)
 35. I'll learn, but only if the teacher gives me a reward. (*Reversed*)
-

Timeline

Because of the high-stakes nature of State of Texas Assessments of Academic Readiness (STAAR) testing in Metropolitan ISD, it is critical that the students be as engaged as possible during the spring semester and during the days leading up to STAAR administration. All seventh-grade students in Texas take writing, reading, and mathematics STAAR tests. Eighth-grade students take four tests, the most of any middle-school grade level (mathematics, reading, science, and social studies). The expectation of the state is that eighth-grade students pass the mathematics and reading tests in order to avoid summer school and possible retention. Metropolitan ISD has designated dates in April and May for STAAR administration. Therefore, spring proved to be the appropriate time to run this gamification intervention with the hopes of improving student engagement and subsequently improving student performance prior to high-stakes, standardized testing.

Per the Urban Middle School administration, any student intervention needed to conclude before STAAR testing began in April 2020. For this reason and given the time constraints of doctoral graduate deadlines, February/March 2020 was the ideal time to run this intervention. Plus, the students had a full fall semester in the class without the intervention being implemented, supporting the validity of the baseline data.

The activities described in Table 3 took place during the study. Additional informal researcher-practitioner observations were also documented in order to improve the final artifact (Appendix A). During Week 1, the pretest of the SEI was administered for seventh- and eighth-grade students in my six Investigating Careers class sections (Appleton et al., 2006). Directly after the SEI administration, I divided all classes into teams of three to six students. Teams then chose to participate in the first team-building challenge, which was a race to properly set a table

with four place settings. The team challenges were designed to interject some fun, to offer teams a way to earn extra points, and as team-building activities to increase team cohesion. Teams also began to earn points for classwork completion. Each day, teams could earn a point if all team members completed the assigned daily work. All students were required to participate on a team; opting out was not possible. Minimal changes were made to the team rosters during the 5-week intervention so that the students had time to form bonds and connect. The goal was to leverage the effects of group contingencies on the classroom teams so that the students were more likely to complete tasks given positive peer pressure. Classwork points were earned from student teams completing tasks and were not content-dependent, allowing the intervention to be used with any class content material.

Table 3

Intervention Activities by Week

<u>Week</u>	<u>Activity</u>
1	SEI pretest; divide students into teams; first team challenge (Setting the Table Challenge with teams competing to see who can properly set four place settings the fastest); begin classwork cooperative team scoring
2	First team challenge continues; continue classwork with cooperative team scoring
3	Second team challenge (Chopstick Challenge with teams using chopsticks to pick up as many pieces of plastic food as possible in one minute); continue classwork with cooperative team scoring
4	Activities suspended for schoolwide state testing
5	Second team challenge continues; winners announced; SEI posttest

The intervention activities continued across Weeks 2, 3, 4, and 5, with a team challenge and classwork points awarded daily for teams completing classwork assignments. During the

second team challenge, student teams had 1 min to pick up as many plastic foods as possible with chopsticks and move them from the center of a table to a plate. The Urban Middle School calendar already had schoolwide testing slated for Week 4 of the intervention. This interruption in instruction is common in the public middle-school setting; therefore, the break was factored into the planning of the intervention. At the conclusion of Week 5, the winning team for each class, as well as the winning team overall, was announced. The overall winning team received a private pizza party, and the teams who won in each class received small snacks. After the winners were announced, students took the SEI posttest (Appleton et al., 2006). A detailed alignment chart is provided in Appendix B.

Reliability and Validity Concerns or Equivalents

The intervention was situated within contextual limitations. For example, the condensed timeline and the limited sample size can be viewed as limiting factors. However, the possibility of discovering an intervention that increases the engagement of a specialized student population (at-risk, minority students from low-socioeconomic-status households) compensates for the limitations and the lack of a control group. The aggregate Student Experience Survey data for Urban Middle School shows the need for student engagement intervention solutions. According to the spring 2019 Metropolitan ISD Student Experience Survey, Urban Middle School scored 62% favorable responses for the student engagement domain. Gamification is a supplemental, content-independent, low-cost intervention that could support student engagement in the classroom and increase student learning.

Internal and External Validity

The context of the intervention lends itself to internal validity issues. The fact that the gamification intervention was positioned early in the second semester may have affected the

students' engagement levels. Typically, early spring is test preparation time for the tested subjects, so the novelty of the gamification intervention juxtaposed with the more stringent test preparation environment of the core content classes may have influenced student engagement positively. On the other hand, the early spring timeline could have worked against student engagement because the intervention ran in the 5 weeks prior to spring break. Students and teachers typically have less energy during this time of the school year versus the fall. Creswell (2014) cited maturation of the subjects as a possible threat to internal validity. This study included students in both seventh and eighth grades. In order to respond to the threat, the grade level of the participants was collected to mitigate the effect of age on the results. Another threat to internal validity was the researcher-practitioner's already established teacher-student relationships. One of the three indicators of student engagement addressed by this intervention was teacher-student relationships. Because the intervention occurred during the middle of the second semester, I (the teacher) already had established a bond with each student. Additionally, my Metropolitan ISD Student Experience Survey scores have historically been higher than the district average. Therefore, the pretest-posttest data for teacher-student relationships may have been affected by these factors.

Additionally, Creswell (2014) cited the interaction of the setting/treatment, selection/treatment, and history/treatment as threats to external validity. In other words, the results of a study are specific to the exact location, specific sample, and time of intervention implementation. Additional measures need to be taken to generalize the results of a study with academic fidelity. Therefore, to eliminate threats to external validity, the results of this action research study will only be used by the administrators and teachers of Urban Middle School to

inform choices of classroom interventions to support student engagement. The results of this study will not be generalized to any other contexts.

Instrument Validity

The SEI was created by Appleton et al. (2006) and is widely accepted as a valid instrument to measure student engagement in middle- and high-school students. According to Google Scholar, the Appleton et al. (2006) article has been cited more than 1,000 times, illustrating the instrument's widespread acceptance in academic circles. In their report, *Measuring Student Engagement in Upper Elementary Through High School: A Description of 21 Instruments*, Fredricks et al. (2011) included the SEI among other survey instruments that measure student engagement in multiple dimensions. Additionally, the reported survey tools included at or near acceptable levels for use, "ranging from .49 to .93, with most scales at .70 to .80" (p. ii). Specifically, the SEI rated an internal consistency of 0.72, measuring student engagement in six different dimensions (teacher-student relationships, control and relevance of schoolwork, peer support for learning, future aspirations and goals, family support for learning, and extrinsic motivation) (Appleton et al., 2006). Lawson and Lawson (2013) suggested that researchers take a more contextualized approach to studying student engagement because multiple factors influence how students interact in the classroom. The SEI aligns with this approach. Specifically, my intervention activities addressed three particular indicators of engagement—teacher-student relationships, control and relevance of schoolwork, and peer support for learning.

Reliability Concerns

The reliability of the results of this study might be queried because of its pre-experimental, one-group, pretest-posttest design without random assignment. No teacher at

Urban Middle School has implemented gamification in their classroom. Therefore, the baseline data from the pretest mirrored the responses of the group with no intervention. The intent of this study was to assess the effects of gamification on African-American-student engagement in order to guide Urban Middle School administrators and teachers in selecting interventions to engage students. That intent can be accomplished by only measuring any changes in engagement to the students exposed to the intervention. Additionally, as the sole researcher-practitioner, I could not necessarily withhold this intervention from half of my class when it could possibly be beneficial to them. Because of time constraints, the intervention could not be repeated prior to STAAR testing. Also, because I ran a quantitative design including all of the students in all six of my Investigating Careers courses, the sample size was increased, thus increasing validity.

Researcher's Resources and Skills

I conducted this study with all of the seventh- and eighth-grade students in my 2019–2020 Investigating Careers class sections. I saw these students on a block schedule every other day for 75 min. This configuration limited classroom interruptions because students were given the pretest, posttest, and intervention during class time as a part of normal classroom activities. Ethical and academic standards gleaned from Doctor of Education program coursework were strictly observed to ensure the reliability of the study. The results will only be utilized by the administrators and teachers at Urban Middle School to make informed decisions about interventions to increase student engagement.

Closing Thoughts on Chapter III

I conducted a pre-experimental, one-group, pretest-posttest action research design without random assignment to assess changes in student engagement after implementing game mechanics (specifically, leaderboards/points and cooperative teams) for 5 weeks in my six

Investigating Careers classes during the spring 2020 semester. The study included seventh- and eighth-grade students, the majority being African American and Hispanic. I used the SEI (Appleton et al., 2006) as the pretest and posttest survey tool. Specifically, my intervention activities addressed three particular indicators of engagement—teacher-student relationships, control and relevance of schoolwork, and peer support for learning. The results of the study will be used to inform classroom intervention choices to improve student engagement at Urban Middle School.

CHAPTER IV

ANALYSIS AND RESULTS

Quantitative data from this single-group, pretest-posttest study of African-American seventh- and eighth-grade students from low-socioeconomic-status households were analyzed using an overlapping-samples *t* test. The SEI was given to students via Qualtrics during their college-and-careers elective course as a pretest in the week of February 10, 2020. The SEI was administered again during class as a posttest in the week of March 9, 2020. I chose the administration dates to possibly help increase student engagement and teacher engagement for the month leading up to spring break because the spring semester has less student/teacher holidays than the fall semester. Data were analyzed in March 2020 using a custom script, Microsoft Excel, and Qualtrics.

Presentation of Data

This study endeavored to increase student engagement for African-American middle-school students through the use of gamification, specifically the use of teams, team challenges, and a leaderboard. The gamification intervention was implemented in February and March 2020. The SEI measures student engagement on six different engagement indicators. Specifically, my intervention activities addressed three particular indicators of engagement—teacher-student relationships, student control over and belief in the relevance of schoolwork, and peer support for learning (Appleton et al., 2006).

As shown on Table 4, the pretest sample size (*n*) was 150 seventh- and eighth-grade students in my six Investigating Careers course sections. The posttest sample size (*n*) was 143 students from this same group. Table 5 presents the resulting data from the pretest-posttest overlapping-samples *t* test categorized by ethnic group.

Table 4*Participants by Test*

	<u>Black / African American</u>	<u>Hispanic / Latino/a</u>	<u>Other</u>	<u>All</u>
Male, pretest	47	18	8	73
Female, pretest	47	21	9	77
Male, posttest	49	16	6	71
Female, posttest	42	21	9	72

Table 5*Student-Group p Values in the Three Sections of the SEI*

<u>Student Category</u>	<u>p Value</u>
Black / African American	< .001
Hispanic / Latino/a	.007
All	< .001

Table 5 displays the overall data for all three engagement indicators as self-rated by my students on the SEI. On this table and all others, estimated *p* values less than .05 (or 5% confidence) suggest the acceptance of my alternative (proposed) hypothesis that the impact of gamification is significant, as well as the rejection of the null hypothesis that the impact of gamification is insignificant. The difference in overall student engagement before and after gamification was significant across all student groups. Specifically, African-American student scores were the most impacted, with a *p* value less than .001. Also notable is that the overall *p* values for both African-American and Hispanic student scores were less than .001, meaning that both student groups experienced a statistically significant increase in student engagement scores

after the gamification intervention on all three engagement indicators—teacher-student relationships, perceived relevance of work, and peer connections.

Subresearch Question 1: Teacher-Student Relationships

Table 6 displays student data pertaining to Questions 1 to 9 of the SEI, addressing the indicator of teacher-student relationships. The inclusion of these questions on the pretest and posttest intended to ascertain whether student engagement in this indicator increased after the gamification intervention. As previously stated, estimated p values less than .05 (or 5% confidence) suggest the acceptance of my alternative (proposed) hypothesis that the impact of gamification is significant, as well as the rejection of the null hypothesis that the impact of gamification is insignificant. According to Table 6, the only significant improvement in student responses was on Question 9: “Most teachers at my school are interested in me as a person, not just as a student.” All-student responses had a p value of .01, indicating higher scores for this question on the posttest compared with the pretest. In other words, the impact of the gamification intervention on teacher-student relationships was insignificant according to Questions 1 to 8, but significant according to Question 9 for all students.

Table 6*Overlapping-Samples t-Test Results for the Indicator of Teacher-Student Relationships*

Survey Question for the Indicator of Teacher-Student Relationships	Black / African American	Hispanic / Latino/a	All
1. Overall, adults at my school treat students fairly.	.46	.62	.59
2. Adults at my school listen to the students.	.13	.62	.27
3. At my school, teachers care about students.	.54	.57	.34
4. My teachers are there for me when I need them.	.22	.75	.53
5. The school rules are fair.	.19	.67	.16
6. Overall, my teachers are open and honest with me.	.65	.94	.84
7. I enjoy talking to the teachers here.	.30	.63	.35
8. I feel safe at school.	.25	.44	.17
9. Most teachers at my school are interested in me as a person, not just as a student.	.10	.05	.01

Subresearch Question 2: Students' Belief in the Relevance of Their Work

Table 7 displays student data pertaining to Questions 10 to 18 of the SEI, addressing the engagement indicator of students' belief in the relevance of their work. The inclusion of these questions on the pretest and posttest intended to ascertain whether student engagement in this indicator increased after the gamification intervention. As previously stated, estimated p values less than .05 (5% confidence) suggest the acceptance of my alternative (proposed) hypothesis that the impact of gamification is significant, as well as the rejection of the null hypothesis that the impact of gamification is insignificant. According to Table 7, the only significant improvement in student responses was on Question 12: "The grades in my classes do a good job of measuring what I'm able to do." All-student and African-American-student responses had p values of .03 and .01, respectively, indicating higher scores for the question on the posttest as

compared with the pretest. However, Question 14: “After finishing my schoolwork, I check it over to see if it’s correct” had a p value of .07 for African-American students when my threshold was less than .05. In other words, the impact of the gamification intervention on students’ belief in the relevance of their work was insignificant according to Questions 10 to 11, 13 and 15 to 18, but significant according to Question 12 and close to the threshold for 14. For Question 12, p values were remarkably low for African-American students and for all students overall, but the p value was not low for Hispanic students. For Question 14, p values were close to the threshold for African-American students and for all students overall. The results for Questions 12 and 14 may be correlated. If students are taking more ownership by checking over their work, then students would most likely believe more in the fairness of their grades in the class. These results for Question 12 and 14, together with the higher p values for the rest of the questions, prove the gamification intervention moderately effective in helping students believe in the relevance of their coursework overall, but effective in helping African-American students and the total group of students feel positively about the grades in the class being an accurate showing of their ability.

Table 7

Overlapping-Samples t-Test Results for the Indicator of Students' Belief in the Relevance of Their Work

Survey Question for the Indicator of Students' Belief in the Relevance of Their Work	Black / African American	Hispanic / Latino/a	All
10. The tests in my classes do a good job of measuring what I'm able to do.	.17	.50	.20
11. Most of what is important to know you learn in school.	.46	.44	.30
12. The grades in my classes do a good job of measuring what I'm able to do.	.01	.50	.03
13. What I'm learning in my classes will be important in my future.	.25	.69	.36
14. After finishing my schoolwork, I check it over to see if it's correct.	.07	.22	.05
15. When I do schoolwork, I check to see whether I understand what I'm doing.	.41	.50	.33
16. Learning is fun because I get better at something.	.14	.25	.14
17. When I do well in school it's because I work hard.	.58	.61	.63
18. I feel like I have a say about what happens to me at school.	.53	.06	.18

Subresearch Question 3: Peer Connections

Table 8 displays student data pertaining to Questions 19 to 24 of the SEI, addressing the students' perceptions of the indicator of peer connections. The inclusion of these questions on the pretest and posttest intended to ascertain whether student engagement in this indicator increased after the gamification intervention. As previously stated, estimated *p* values less than .05 (or 5% confidence) suggest the acceptance of my alternative (proposed) hypothesis that the

impact of gamification is significant, as well as the rejection of the null hypothesis that the impact of gamification is insignificant. In direct contrast to Tables 6 and 7, Table 8 shows that all questions on the indicator of peer connections were significantly changed from pretest to posttest, with the exception of Question 24. In other words, the impact of the gamification intervention on students' peer connectedness was insignificant on Question 24, but significant in some way on Questions 19 to 23. For Question 24, "I have some friends at school," *p* values were high for African-American students, Hispanic students, and all students. Therefore, while the gamification intervention was most effective on the indicator of peer connections, it did not affect scores for any student group relative to the students having friends at school.

Table 8

Overlapping-Samples t-Test Results for the Indicator of Peer Connections

Survey Question for the Indicator of Peer Connections	Black / African American	Hispanic / Latino/a	All
19. Other students at school care about me.	.020	.240	.010
20. Students at my school are there for me when I need them.	< .001	.200	< .001
21. Other students here like me the way I am.	.010	.030	< .001
22. I enjoy talking to the students here.	.010	.290	.010
23. Students here respect what I have to say.	.003	.020	< .001
24. I have some friends at school.	.770	.560	.750

Notably, African-American students had significantly low *p* values on all questions for the indicator of peer connections, except for Question 24, which, as detailed above, was

insignificantly changed for the all-student group from pretest to posttest. On the other hand, Hispanic students had high p values of .24, .20, and .29, respectively, for Questions 19, “Other students at school care about me,” 20, “Students at my school are there for me when I need them,” and 22, I enjoy talking to the students here.” Given the high p values of Hispanic students on Questions 19, 20, 22, and 24, then, it was determined that although all-student responses overall indicate the significance of gamification intervention for the indicator of peer connections, Hispanic students only reported the significance of the intervention on the factors of other students liking them as they are and students respecting what they have to say (Questions 21 and 23, respectively).

Results

The teachers and administrators of Urban Middle School recognize that its African-American students need additional classroom support to increase their engagement and productive interactions during class. According to the aforementioned data analyses, allowing students to work in teams, issuing brief team challenges, and keeping a class leaderboard that displays team points significantly increases peer connections within the classroom setting. Peer connections are an indicator of student engagement according to Appleton et al. (2006). Therefore, improving peer connections in the classrooms of Urban Middle School could positively influence student engagement.

Interaction with the Context of the Study

The gamification intervention fit seamlessly into the context of my six Investigating Careers classes because it is a wraparound intervention that serves as an overlay to the existing curricular activities. This was my 4th school year using some form of gamification with my classes in the spring. In my 1st year teaching at Urban Middle School, I learned that both the

students and I felt tired and overwhelmed in the spring because of less breaks in the school calendar. Additionally, the spring semester is test-preparation season for public-school students and teachers, so I used gamification to break up the monotony that can accompany test preparation. I have found that gamification is an easy way to introduce some fun and novelty into an expectation-rich school environment.

The first operational issue I encountered was that as the researcher and the practitioner, I could not in good faith read the pretest results without risking skewing my perspective on the intervention. I was concerned that I would consciously or subconsciously change the delivery of the intervention to improve the posttest outcomes. Additionally, the questions on the SEI are more generalized to address an entire school, not a specific classroom. I did not change the language because I did not want to tamper with the validity of the instrument. When administering the test, I did tell the students to think of our class specifically. I should have written an accompanying script to standardize the language I used to introduce the instrument. I also question if the literacy level of the SEI proved to be too high for some of my students. Although it was created for middle-school and high-school students (Appleton et al., 2006), I possibly should have added definitions for some of the words in my introduction script. I also should have translated the SEI into Spanish for my students who are learning English to make sure that all students understood the questions fully.

The selection of the student teams presented another operational issue. I initially selected the teams by attempting to mix up ability levels while retaining at least one friend per group for each student. The goal was for student teams to be forged during the first 2 days of the intervention and then stay the same throughout the study period in order to give students a chance to bond with their teammates. However, 2 weeks into the intervention, I was still

receiving student requests to change their teams. I honored most of the requests because I considered student buy-in crucial to their wholehearted participation in the competition.

Additionally, I encountered multiple unannounced changes to the school's teaching schedule that tested the flexibility of the gamification construct. We had to pause the intervention for an entire week for testing. However, I did not extend the length of the intervention because this kind of random disruption is common in the public-school setting. Continuing the intervention without modification more closely mimicked the real-life challenges that teachers will encounter if they choose to use gamification in their classrooms. Additionally, a time period of 4 to 5 weeks has typically been long enough for students to become invested while not yet starting to lose hope of winning. A period of 4 to 5 weeks is also long enough for them to tire of their teammates and start to ask for another shot at winning. I had planned to reset the points, allow the students to choose new teams if they chose, and restart the competition with new challenges after spring break. However, the COVID-19 pandemic upended the world and closed school indefinitely.

The interruptions to the teaching schedule seemed to build anticipation for the students. Anecdotally speaking, an eighth grader approached me in the hall on a day that our class schedule had been disrupted by testing and said that he was "so sad" because he wanted to come to my class to finish the Chopstick Challenge. His comment leads me to believe that the intervention was doing exactly what I created it to do—increase student engagement.

I observed other changes in student behavior as a result of the gamification intervention. In general, there was a general sense of joy and excitement in the classes each day that was not present before the intervention. A few students in each class had the habit of only completing work sporadically, not daily. I witnessed most of these students embrace the team concept and

begin completing work regularly so that they did not cause their team to miss their daily points. On the other hand, about 5 students of the 196 in my classes had never completed daily assignments no matter what I tried—and still did not get on board with their teams during the period of gamification intervention. My response was to group these students together (if they were in the same class) so that their defiance did not negatively impact other teams. Additionally, unbeknown to the students, on most occasions, I gave points to teams with noncompliant students on them if the other students on the team finished the work. Restarting the program frequently gives noncompliant students an on-ramp to engage if they so choose. Running a competition for an entire semester does not give students the chance to change their minds and begin participating.

One of the most surprising responses from the students was that even after I announced the overall winning teams and told them that the competition was over, the students still wanted to try to improve their score on the final team challenge, the Chopstick Challenge. This happened in every class—indicating to me that the students were completing the challenges for a reason other than earning points, possibly just for the fun of it.

Personally, I looked forward to coming to school during the gamification intervention more so than any other time during the school year. On days when I considered taking paid time off, I chose to go to school anyway so that the classes could all complete their challenges. In some way, I think I felt like I was the coach of all the teams. My engagement with students during independent practice was higher than usual. I enjoyed teaching more during those 5 weeks of the gamification intervention than I did all year long.

How the Research Impacted the Context

The COVID-19 pandemic hit Texas right after I completed data collection with my students, closing down all schools in the area indefinitely. Therefore, the research results were presented to my school administrator by conference call. The reception was overwhelmingly positive. Two themes emerged in response to my presentation of the data—how the gamification intervention directly addressed the cultural needs of the school’s African-American students and the role of competition in the learning process.

Initial comments noted how the gamification intervention directly addressed the needs of the school’s African-American students for positive peer and teacher-student relationships. The data showed that African-American students felt more connected to each other after the gamification intervention. To that end, comments were made about how hard it has typically been in the past to support students as they make those connections. Administration testified to observing our students, 99% of whom are from low-income households, shun personal connection because it requires vulnerability. Because teams earned classwork points by having everyone on their team complete the assignment for the day, the students learned to offer support to their teammates to accomplish the task, thus removing or diminishing the barrier of vulnerability. I did not penalize students grade-wise if every team member did not complete the daily classwork. For example, if two students on the team completed the classwork and the other three did not, the two who finished still received their grade for the day even though the team did not get its points for that day. I purposely constructed the game so that grades would not be negatively impacted by a team’s lack of work—meaning that, potentially, individual students could have justifiably chosen not to participate. Instead, most teams figured out each other’s strengths and weaknesses to allow for cooperative group work.

Additionally, during the conference call, administration mentioned having observed lack of parental support for peer relationships as one of the primary barriers to peer connections. Administration described multiple instances of parents of African-American students devaluing the term “friendship” and instead telling their students to focus on their grades and work. This factor also may explain why the only question in the peer connections subset that did not show an increase in p value for any group was the question related to having friends at school. The gamification intervention gave students the motivation to make peer connections that they probably would not have made under natural circumstances.

Administration also mentioned how impactful competition is to the classroom community, saying that competition is valid as a vehicle for students to connect and to support community building. The gamification intervention replicated athletics, allowing students to identify and build on each other’s strengths and weaknesses. Because the students were forced to work together, they chose to lay aside any outside rules about friendship learned from home or elsewhere in order to accomplish the bigger goal of winning the game. Also, as with most teenagers, the African-American students at the school are constantly and overly concerned with how they look and the perceptions of others. The fact that they risked embarrassment to participate in the challenges may translate to the students being more open in different educational platforms. The gamification intervention provided students with a safe place to try new things and to be vulnerable with each other,

Regarding the helpfulness of the intervention, administration was extremely positive about the implications of the results, noting that it would be easy for core classes to implement because the intervention was a wraparound for existing curriculum and was not disruptive in nature. It was mentioned, however, that core classes would have to think differently about their

team selection process to more intentionally accommodate for differently abled students respective to different subjects. It was also noted that the intervention provided students and teachers with built-in opportunities for positivity and validation, which all students need, especially students who are living in poverty.

A few questions arose during the presentation, offering opportunities to think through veins for future study. One of the questions asked was if the students responded positively to the class challenges because challenges included items that had never before been presented to the students, or if they responded positively because of the competition aspect. A future study could explore the role of novelty in the classroom to tease out if the outcome would be just as positive if new materials were introduced, but without winners. Also, questions arose about how classroom management would be impacted for teachers running the intervention. Because individual teachers have differing levels of classroom control and different teacher-student relationships, what can be done to help ensure positive outcomes? A future study could explore this question.

Closing Thoughts on Chapter IV

This research project sought to increase the student engagement of seventh- and eighth-grade African-American students from low-income homes by introducing gamification as a wraparound intervention. During the 5 weeks of the program, 150 students worked in teams to earn points by completing classwork assignments and winning two different student challenges. The SEI (Appleton et al., 2006), which measures student engagement on six different engagement indicators, was used as the pretest and posttest. Specifically, the intervention activities addressed three particular indicators of engagement—teacher-student relationships, control and perceived relevance of schoolwork, and peer support for learning (Appleton et al.,

2006). According to the resulting p values from the overlapping-samples t tests, the peer connections indicator of the SEI was most impacted by the gamification intervention with African-American students, showing statistically significant changes for five of the six questions—the implication being that students felt more connected to each other as a result of the gamification intervention.

Taken in context, these findings are significant. According to Urban Middle School administration, African-American students have historically struggled with both teacher-student relationships and peer connections. School leaders see this intervention as a possible tool for teachers of all content areas to use in their classrooms. Although there are still remaining questions about how teams should be selected and how this intervention would impact classroom management, the overall response to the intervention and future implementation was positive.

Additionally, the students in the study expressed their enjoyment of the gamification intervention anecdotally and through their actions in the classroom. Students who had historically completed classwork infrequently joined in with the intervention and began completing their classwork with higher frequency. However, students who were noncompliant before the intervention mostly remained noncompliant during the intervention, despite having the support of a team. Despite noncompliant students being unaffected by the intervention, I observed an increase in joy, laughter, and excitement in all six of the classes, pointing to a higher level of engagement on the whole over the 5 weeks of the gamification intervention, as well as proving to be the happiest period for me as a teacher during this school year.

CHAPTER V
SUMMARY AND CONCLUSIONS

Summary of Findings

The goal of this research was to substantiate my experiential, anecdotal, and observational evidence that gamification increases student engagement for the students at Urban Middle School. Seventy percent of Urban Middle School students are classified as at-risk, 72% are African American, 24% are Hispanic, and 98.7% are categorized as low-socioeconomic-status, so it is vitally important that the teachers utilize every possible tool to support these scholars.

More specifically, my comparative research question was as follows: What are the differences in student engagement before gamification intervention and after gamification intervention? The SEI presented by Appleton et al. (2006) measures six different dimensions of student engagement. I conducted a pre-experimental, one-group, pretest-posttest design as defined by Creswell (2014) to determine if the use of a leaderboard and student teams would increase student engagement in three of the six dimensions—teacher-student relationships, students' belief in the relevance of their coursework, and peer connections. The following are three subresearch questions addressed in this study: (1) What are the differences in the student engagement indicator scores of teacher-student relationships before gamification intervention and after gamification intervention? (2) Does implementing gamification increase students' belief in the relevance of their work? (3) Does implementing gamification increase peer connections?

The SEI was given to students via Qualtrics during their college-and-careers elective

course as a pretest in the week of February 10, 2020. The SEI was administered again during class as a posttest in the week of March 9, 2020. Quantitative data were analyzed using a partially overlapping–samples *t* test in March 2020 using a custom script, Microsoft Excel, and Qualtrics. The pretest sample size (*n*) was 150 seventh- and eighth-grade students in my six Investigating Careers course sections. The posttest sample size (*n*) was 143 students from this same group. According to the resulting *p* values from the partially overlapping–samples *t* test, the peer connections indicator of the SEI was most impacted by the gamification intervention with African-American students, showing statistically significant changes for five of the six questions—the implication being that students felt more connected to each other as a result of the gamification intervention.

Taken in context, these findings are significant. According to Urban Middle School administration, many of our African-American students have historically struggled with both teacher-student relationships and peer connections. School leaders see this intervention as a possible tool for teachers of all content areas to use in their classrooms. Although there are still remaining questions about how teams should be selected and how this intervention would impact classroom management, the overall response to the intervention and future implementation has been positive.

Additionally, the students in the study expressed their enjoyment of the gamification intervention anecdotally and through their actions in the classroom. Students who had historically completed classwork infrequently joined in with the intervention and began completing their classwork with higher frequency. However, students who were noncompliant before the intervention mostly remained noncompliant during the intervention, despite having the support of a team. Despite noncompliant students being unaffected by the intervention, I

observed an increase in joy, laughter, and excitement in all six of the classes, pointing to a higher level of engagement on the whole over the 5 weeks of the gamification intervention, as well as proving to be the happiest period for me as a teacher during this school year.

Discussion of Results in Relation to the Extant Literature and Theories

Overview

Lawson and Lawson (2013) discussed viewing the different emotional requirements for engagement as the social ecology of engagement. The authors believed that engagement is best measured in multiple dimensions, including peer relationships, family support, and activities outside of the classroom. Specifically, Ryan's and Deci's self-determination theory (2017) outlined three basic human psychological needs that support engagement and motivation—competence, autonomy, and relatedness. Relatedness refers to the two-way feeling of being connected and connecting with others. Additionally, relatedness is addressed from the teacher perspective by Ladson-Billings' (1995) cultural competence tenet of culturally responsive pedagogy. Citing the self-determination theory and culturally responsive pedagogy, my gamification intervention endeavored specifically to increase student engagement by increasing students' feelings of relatedness covered by two of the SEI domains—teacher-student relationships and peer connections. However, only the peer connections domain was significantly affected by the gamification intervention.

Subresearch Question 1: Teacher-Student Relationships

As previously stated in Chapter IV, the only significant improvement in student responses was on Question 9 of the SEI: "Most teachers at my school are interested in me as a person, not just as a student." In other words, the impact of the gamification intervention on

teacher-student relationships was insignificant according to Questions 1 to 8, but significant according to Question 9 for all students.

According to my understanding of Eryilmaz's (2014) research on perceptions of teachers, as well as my high scores on the Metropolitan ISD student perception survey, I would be classified as a generally "liked" teacher with positive teacher-student relationships (Gillet et al., 2012; Roorda et al., 2017). It is uncertain whether the lack of positive change from pretest to posttest results in the teacher-student indicator of the SEI was because students already felt that they had a good relationship with me by March of the school year or if the gamification intervention truly did not affect this domain.

Additionally, researchers have stated that secondary-school teacher-student relationships are less intimate than elementary-school teacher-student relationships (Gillet et al., 2012; Roorda et al., 2017). Therefore, it is possible that my students' response on this indicator was just indicative of middle-school students being less attached to their teachers. Questions remain as to whether an add-on like gamification would be an effective tool for a teacher with poor teacher-student relationships or whether the gamification intervention could be used to improve teacher-student relationships.

Subresearch Question 2: Students' Belief in the Relevance of Their Work

As previously stated in Chapter IV, the only significant improvement in student responses was on Question 12 of the SEI: "The grades in my classes do a good job of measuring what I'm able to do." For Question 12, *p* values were remarkably low for African-American students and for all students overall, but the *p* value was not low for Hispanic students. For Question 14, *p* values were close to the threshold for African-American students and for all students overall. The results for Questions 12 and 14 may be correlated. If students are taking

more ownership by checking over their work, then students would most likely believe more in the fairness of their grades in the class. These results for Question 12 and 14, together with the higher p values for the rest of the questions in this domain, prove the gamification intervention moderately effective in helping students believe in the relevance of their coursework overall, but effective in helping African-American students and the total group of students feel positively about the grades in the class being an accurate showing of their ability.

According to Evans and Boucher (2015), empowering students by giving them the ability to choose curricular activities when possible improves student motivation. However, I chose to exclude the additional element of student choice in hopes of better isolating the primary variables in my gamification intervention—the student leaderboard and incorporating cooperative teams. It is possible that the t test results for this indicator could have been more positively impacted had I included student choice with regard to their classwork assignments. Students were allowed to choose their teams. Then, teams could choose whether or not to participate in either of the two team challenges (Setting the Table Challenge and Chopstick Challenge), but all students from all groups completed the same classwork assignments. Cooper (2014) discovered that student-focused classrooms have higher levels of engagement, which may account for students' positive responses on Question 12 regarding the fairness of grading in my class. This gamification intervention was student-centered, which could have possibly impacted students' views of fairness in my class.

Subresearch Question 3: Peer Connections

As previously stated in Chapter IV, in direct contrast to the results on teacher-student relationships and coursework relevance indicators, all SEI questions on the indicator of peer connections were significantly changed from pretest to posttest, with the exception of Question

24. The p values for the peer connections indicator of the SEI showed the most statistically significant difference postgamification intervention for African-American students. These results indicate that students felt closer to their peers after the gamification intervention.

Group contingency is a long-standing classroom management tool used often by educators. For example, Tingstrom et al. (2006) meta-analyzed 33 years of literature written about the Good Behavior Game and all of its different iterations using group contingency in the classroom. Groves and Austin (2019) discovered that the Good Behavior Game positively affects students' relationships with their peers. Therefore, because my gamification intervention incorporated group contingency and the use of a leaderboard, similar to iterations of the Good Behavior Game, the findings of this study align with those of Groves and Austin (2019). The African-American students in my study felt more connected to each other as evidenced by the p -value change on the peer connections indicator of the SEI. This result adds to the existing body of literature, as Texas A&M database queries for "gamification" or "Good Behavior Game" and "African-American" or "Black students" yields no results. My target demographic of African-American middle-school students from low-income households would be deemed a "novel population" according to Joslyn et al. (2019, p. 811).

Interestingly, the only question without improvement on posttest results was the question asking if students had friends at school. Upon further research, I propose that the wording of the question may not have been culturally relevant, thereby skewing the results. The SEI assumed racial homogeneity of thought on students' approaches to friendship when that is not necessarily the case. According to Way and Chen (2000), African-American students are more likely to have friendship groups outside of school than White students. African-American students would therefore be less likely to express a closeness to people at school, which supports my results.

Culturally relevant pedagogy, as defined by Gloria Ladson-Billings (1995), is the inclusion of the culture of the student to facilitate academic success. More culturally relevant wording of the question could have resulted in different data for the African-American students in the study.

A sense of relatedness and connectedness is essential for every student, but especially for African-American students. Akua (2020) outlined 13 standards of Afrocentric education upon which schools and communities can build high-quality, culturally relevant educational opportunities for African-American students. Standard 3 of 13 states that many African cultures place high value on family and community, so these values should be applied to the classroom. Standard 7 of 13 recommends cooperative learning as a method that mirrors the African-American sense of community. According to the data from this intervention, gamification may help teachers increase relatedness and peer connections in their classrooms, therefore improving student motivation and engagement. Additionally, the intervention results imply that the gamification intervention could become a part of a teacher's efforts to nurture their cultural competence of their students and create classroom environments where all students feel like they belong and are connected. Cultural competence is one of the three tenets of culturally responsive pedagogy developed by Ladson-Billings (1995).

Discussion of Personal Lessons Learned

I transferred to Urban Middle School from one of the top magnet schools in the district. I learned very quickly during my 1st year at Urban Middle School that I had to wipe my canvas clean and develop a brand new approach so that I could learn the art of teaching children who are very different from me. Although I am an African-American woman and 72% of our school population is composed of African-American students, our daily lives were very different. Every day during my first semester, I would try a lesson plan, parts of it would completely fail, I would

cry, and then I would revamp and come back the next day to see if I could improve the lesson delivery. By the time the spring semester came around, I was physically and mentally exhausted and willing to try just about anything to get my students to accept me and to get them to work consistently. Spring of 2016 was the first time I tried running my classroom like a video game. The turnaround in the classroom atmosphere was palpable and immediate. I went from dreading school and viewing my teaching from a deficit lens to genuinely enjoying my time with the students. Now, I run some iteration of the game every spring. I have learned that my joy and engagement is vital to the well-being of my students. Engagement begets engagement. Once the students see my effort, consistent smiles, and laughter, they respond with more effort, smiles, and laughter of their own. Spring has become my favorite time of the school year. I believe that the novelty of the gamification approach brings a sense of wonderment and awe to the classroom. Neither the students nor I can resist the excitement of a game of chance or the suspense of finding out which team is in the lead each day. Although the teacher-student relationships indicator of the SEI did not show a statistically significant increase in this study, these fun, shared experiences seemed to bring us closer together and to build our trust in one another from my perspective.

My work in conducting this study underscores the importance of valuing students' opinions and responding to their needs and preferences with genuine care. As I presented these findings to our school administration, the conversation continually looped back to replicability of the gamification intervention and what role, if any, is played by the students' perception of the teacher in the success of a curriculum add-on like gamification. In retrospect, I feel that the students' perceptions of me influenced every aspect of this intervention and shaded every interaction in the classroom. More research is needed to ascertain the impact of the different

types of teachers on African-American students from low-income homes. Also, the MET Project (2012) of the Bill & Melinda Gates Foundation has already proven a positive correlation between positive student perceptions of teachers and academic achievement. Further research is needed to ascertain whether gamification can be used to improve students' perceptions of their teachers.

This study also forced me to revalue the *art* of teaching (the mix of academic and socioemotional activities that a teacher selects for learning) as equivalent to the *science* of teaching (a teacher's knowledge of pedagogical techniques). In the current standardized-testing culture, data-driven instruction has been elevated to the detriment of teacher autonomy and flair. Both are important. Parker J. Palmer (2007) stated in his seminal work, *The Courage to Teach*, that "good teaching comes from identity, not technique, but if I allow my identity to guide me toward an integral technique, that technique can help me express my identity more fully" (p. 66). Of course, teachers are responsible for proving that all students have made academic gains commensurate with their ability by year-end, and they have multitudinous tools to choose from to help accomplish this task. How an individual teacher chooses to use each of these tools depends on their personality and preferences. This is my definition of the art of teaching. Because a teacher's knowledge of pedagogical techniques (the science of teaching) and the effectiveness of the teaching formula that they choose to utilize (the art of teaching) varies, questions remain as to how this teaching autonomy should be "earned" by teachers. I set forth this gamification intervention as one of numerous tools that a teacher can choose as they pursue the art of teaching, realizing that it may not fit well with all teachers' identities.

Implications for the Context

Undertaking and implementing this action research project at Urban Middle School provided context-specific, research-based data for the teachers and administration to consider

during curriculum implementation. Because this was an action research project, the data came from the school's actual students, eliminating questions that typically come with applying data to a school context. These data show a snapshot into the minds of this school's particular students, so school leadership can plan according to the results without having to retrofit the information to the students of Urban Middle School.

The goal is to make action research a normal activity at Urban Middle School by encouraging other teachers to embrace the art of teaching and try new research-based approaches. After the nonintrusive, seamless implementation of this action research model, Urban Middle School administration now has a model for other teachers to use to accomplish their action research goals. I hope that Urban Middle School will become an incubator and laboratory for creative teaching ideas.

Additionally, the results of this research emphasize that a homogeneous approach to teaching and learning is not appropriate for Urban Middle School despite the fact that 99% of the student body is classified as low-socioeconomic-status and comes from low-income households. Each ethnic group and gender group has different needs. The results of this research demonstrate the need for culturally relevant and gender-specific classroom interventions at Urban Middle School. Hopefully, other researcher-practitioners will emerge from among the school's teacher-leaders to continue to test new research-based ideas.

Implications for the Field of Study

This study followed the recommendations of Dicheva et al. (2015) and Landers et al. (2018) for further research on particular game mechanics with specific audiences. This study demonstrates that middle-school African-American students from low-income homes have needs that set them apart from their classmates of other ethnic groups and of other socioeconomic tiers.

Their needs deserve to be seen. Although these results are not generalizable across contexts, gamification can now become one of the many tools available to the teachers at Urban Middle School when they and their students need a boost in engagement.

Additionally, this study gives credence and credibility to the practitioner-researcher action research model. Educational researchers are seeking answers for closing the achievement gap and other inequities in learning. Teacher input and buy-in is essential for research because the goal is to create not only theories, but working models that function in the context of the traditional school model. This study extends the partnership between academia and application, creating a new avenue for innovative practices to be created and improved. As a burgeoning researcher-practitioner, I have learned through this study and other doctoral training how to merge theory with practice. I am now an additional qualified voice empowered to speak out on behalf of underserved students.

Lessons Learned and Recommendations

I have discovered that the implementation of gamification in the classroom is a very individualized and personal exploit by necessity. It is hard to genuinely “sell” a product or technique without believing in it wholeheartedly. According to Landers et al. (2018), buy-in is a moderating feature of gamification intervention design. In other words, positive perception of the gamification design and game mechanics can affect the outcomes of the intervention. Customization of each component of the process allowed me to more effectively convince students to embrace the intervention. I recommend that before other educators choose to implement gamification in their classrooms, they engage in reflective prework to align the components of the intervention with their personal preferences. The major components to ponder are selection of the game theme, team selection process, role of student choice in the

intervention, what needs to be incentivized in the class, students' capacity for cooperative learning, leaderboard and point display options, and selection of team challenges.

The development of the theme of the game should consider relevance to the students and relevance to the teachers. For the 1st year of gamification in my classroom, I called the game "Get Money" after a popular hip-hop song from the 1990s that reminded me of college. The theme also aligned to the game construct of the students moving up the ranks to become the chief executive officer (CEO). Another year, it was called "Level Up" after a popular song and dance challenge that both I and the students liked. The first team challenge that year was a dance-off between teams. Of course, I joined in on the fun. The game for this study was called "Band\$," using money as the game currency again with teams attempting to earn the most money in 5 weeks. Each component of every gamification intervention has been designed to be attractive and appealing to both the students and to me, including the game title and theme. The more closely interwoven the theme is with the teacher's preferences and the students' interests, the more a predisposition exists to enjoying the game.

Like most teenagers, my students were extremely particular about the selection of their teammates, so patience and responsiveness were required to ensure the buy-in of my most important stakeholders. The team selection process was longer and more tedious than I planned. Originally, I selected teams considering friendships, ability levels, and work ethic. Before I made the team announcements, I informed the students that changes would be made on an individual team basis and by mutual consent of the team members and teams. In other words, students had to negotiate with each other, advocate for their position and build consensus between all parties before I would even entertain the idea of switching teammates. The gamification intervention provided an opportunity for students to practice these highly valuable

life skills in context. The teams were surprisingly respectful during the trade window. However, teams still were asking to make changes 2 weeks into the intervention. If they created a consensus between all students involved, I honored most of the requests to demonstrate that the game was student-centered and that I was listening to them. I recommend that teachers decide before beginning what their stance will be on team selection. Decisions include who selects the teams, if team member swaps are allowed, and if teams can earn the right to work with their friends. When structuring the team selection process, the teacher has to find a balance between fairness and appeasing students that works for the particular class structure and personality.

After reflecting on my planning-time limitations and my classroom climate, I had to decide whether or not to include personalized learning / student choice as one of the components of the game. For example, during one version of the game, students were allowed to choose between three different assignments to earn their classwork grade and team points in a blended learning model. In other years, I have used a tic-tac-toe board of choices, where students selected their own work path. The 1st year, I used more of a personalized learning approach, where students could move at their own pace through different “levels,” and each level had a different set of assignments for students to customize. The gamification intervention for this study did not include personalized learning or student self-pacing. By the time I began to design the intervention in January, the overall classroom climate was warm and cohesive. Also, I wanted to complete this study utilizing the simplest version possible to make the intervention as versatile as possible. After direct instruction, student teams were all given the same classwork assignment to complete. If all team members completed the assignment, the team earned a point for the day. If any member of the team did not complete the assignment, no point was awarded. This design could be implemented by any teacher in any type of classroom. The purpose of this

gamification intervention was to ignite student engagement with the least amount of additional planning.

However, a gamification intervention is versatile enough to be utilized to incentivize any classroom behavior. In past years, I have used gamification to incentivize attendance by awarding extra points for coming to class. I have also used gamification to incentivize classroom behavior by not awarding points to teams whose members could not follow the classroom rules. The more complex the structure for winning points, the more planning time required. Before beginning gamification, I recommend that teachers clearly outline how much time they want to dedicate to a gamification add-on and which behaviors they want to incentivize. That knowledge can inform how student choice, personalized learning, and blended learning are used during the intervention.

Additionally, I had to assess my students' capacity for cooperative group work and respond accordingly in order to scaffold them toward the desired outcome of gamification success. The 2019–2020 school year was my 5th consecutive year serving at Urban Middle School. Generally speaking, it could not be assumed that the students in my class had ever been a part of a productive, positive team. So I spent Week 1 of the challenge setting norms for team behavior. The students created team names, developed a team contract, and participated in an exercise where they were required to compliment each other. Those three activities were worth the class time required because I had very few instances of unsportsmanlike conduct during the game. Teachers have to be prepared to scaffold students' capacity to work cooperatively.

Lastly, I had to select the leaderboard and point display options and team challenges that agreed with my personal preferences and the students' interests. We displayed team points on a bulletin board in a high-traffic area of the classroom. Every day, students came in, got their

materials, and looked to see which teams were in the lead. I chose to forgo an online leaderboard, mostly because I needed the accountability from the students to prompt me to keep it updated. I knew that each day they would come in looking for the new points to be added, which made me more consistent with my record keeping. However, if points were tracked online, parents could also be kept abreast of the standings. Additionally, I had to choose team challenges that were not too time-intensive, but also challenges that were fun for me and the students. For example, I chose the Chopstick Challenge because I am proficient using chopsticks and because most of my students had little experience with them. I took a two-pronged approach to every component of this gamification intervention that considered my preferences and students' interest equally.

At the conclusion of this study, several questions still remain that deserve further consideration. For example, research could be conducted to learn more about the role of group contingency alone in increasing engagement. My study combined both group contingency and gamification. Therefore, further research is needed to determine the specific effects of group contingency only on African-American students. Relatedly, additional studies could be conducted purely on the other mechanics of gamification tested in this study, specifically the use of a leaderboard and student challenges. However, the data from this intervention show that the combination of both group contingency and a leaderboard had positive effects on peer connectedness at Urban Middle School. Furthermore, Landers et al. (2018) recommended that researchers also attempt to discover the reasons why certain game mechanics are impactful on particular audiences, so qualitative study of gamification from both the teacher and student perspectives would be a beneficial addition to the body of literature.

Additionally, further study is recommended on including this gamification intervention in core subjects, such as mathematics, science, reading, and social studies. This intervention as written could possibly be a wraparound intervention for any class at Urban Middle School, as the elements of the activities are not content-specific. However, further study would increase the knowledge of challenges specific to using the intervention in classes with state-tested content.

Closing Thoughts on Chapter V

This record of study endeavored to increase the student engagement of African-American students at Urban Middle School through a gamification intervention that incorporated group contingency, team challenges, and a leaderboard. Surprisingly, the intervention had the strongest effects on the peer connections of my African-American students. Relatedness is essential for motivation and engagement (Ryan and Deci, 2017). Engagement is essential for learning. Theoretically, because relatedness can be influenced, so, too, can engagement.

COVID-19

I administered the SEI posttest to my students the week before spring break. Then, the announcement came from our superintendent that all schools would be closed indefinitely to slow the spread of COVID-19. Urban Middle School flipped from a traditional brick-and-mortar campus to an online campus in 48 hours flat. Teachers traded their physical spaces for Google Classrooms, and we carried on the school year the best we could under the circumstances.

One of the requirements for teachers was a weekly live class meeting via Zoom. Thirty-five students joined my live session out of the 196 students on my roll. The next highest number of student participants on a Zoom call for Urban Middle School in the 1st week was 16. I partly attribute my high participation numbers to the recent conclusion of the gamification intervention. I believe that my classes simply liked being together, as proven by the significant difference in

the posttest scores for the peer connections indicator. Other teachers asked how I managed to get so many of my students to log in, and I feel that they participated because of their relationships with each other and with me. We liked each other, and that translated into action.

Also, the school year was cut short before I had the opportunity to share these findings and techniques with the other teachers at Urban Middle School. I look forward to training the teachers at Urban Middle School next school year and supporting them as we hopefully continue this tradition of on-campus action research. This experience was truly life-changing for me because I applied the knowledge gained through my doctoral studies to help the students whom I serve in new ways. I await the opportunity to support other teachers on my campus as they develop and implement innovative teaching practices.

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APPENDIX A

ARTIFACT

Recommendations for Successful Gamification Implementation

Planning

- Personalization and Buy-In: Both the teacher and the students have to enjoy and buy in to the gamification intervention for it to be motivational (Landers et al., 2018).
 - Select a game theme that aligns with what both you and your students enjoy. For example, twice so far, I have named the gamification intervention after popular songs or dance challenges that the students recognized, and I found entertaining.
 - To help support your personal teacher autonomy (Ryan & Deci, 2017), select team challenges that are fun, exciting, and relevant for you and the students.
 - Do you have secret skill, like juggling or hula-hooping? Are you really good at an online video game or skill, such as speed typing? Think about how you could include these as team challenges for your students.
 - Create challenges that also share who you are with the students so that you increase the feelings of relatedness (Ryan & Deci, 2017)
 - Additionally, select challenges with a hint of novelty to alleviate student boredom and increase learning and interest (Kapp, 2012). For example, there was only one Chinese food restaurant in our neighborhood, so I assumed that having a competition using chopsticks would be a new challenge for most of my students.

- Leaderboard: Herges et al. (2017) found that extrinsic motivation works well with middle school students. Therefore, the leaderboard is a key component to the success of a gamification intervention.
 - Decide if you are going to display your leaderboard physically in the classroom, digitally, or both. Make a proactive plan for ensuring that points remain current.
 - Pros for a physical, in-class leaderboard include a daily visual reminder for the teacher to update points, the facilitation of independent student discussions about the results and visual representation to visitors to your classroom of the work students are doing with this novel approach.
 - Pros for online leaderboards include the ability to easily share results outside of the classroom with parents and other stakeholders, increased interactivity
 - Sample websites to track points online include Edmodo and Class Dojo.
 - Decide if your game will involve the teams only gaining points or if students will also be able to lose points. Clearly define the behaviors that will earn points or lose them. Fairness is important.
- Choose prizes that are realistic, affordable and easy to access.
 - For example, the team that was in the lead when students walked into class each day was allowed to sit in rolling chairs that I had collected from around the school instead of their ordinary stationary chairs.
 - I knew that only one team would win out of all my classes and that I had limited teams to 5-6 students, so a pizza party was feasible for that small number of students.

- I have also had food and prizes donated by local businesses and restaurants previously.
- Listen carefully to what the students complain about or ask you for often. One year, the winning teams received inexpensive earbuds because I overheard them complaining each day about losing theirs.

Implementation

- Use gamification as a wraparound for any content and any middle-school classroom at Urban Middle School.
- Student Choice: According to Evans and Boucher (2015), empowering students by giving them the ability to choose curricular activities when possible improves student motivation.
 - Layer in levels of difficulty. The more student choice you incorporate, the more time planning will take. Begin with the simplest form of implementation (a leaderboard and teams, giving points for doing regular curriculum work).
 - Then add in additional team challenges and more student choice as needed to keep students engaged.
 - For example, you could give teams a menu of curricular activities to choose from for classwork each day. Furthermore, you could make harder assignments worth more points to motivate students to attempt more challenging content.
- Run the intervention for 4 to 6 weeks with one team challenge per week maximum. This will cut down your prep time. The more team challenges you incorporate, the more prep time will be required.

- Team Selection Process: Authors report that secondary-school students depend more on support from peers than support from teachers (Gillet et al., 2012; Roorda et al., 2017). Therefore, the team selection process is an important factor in the success of the gamification intervention.
 - To increase student autonomy and sense of relatedness (Ryan & Deci, 2017), allow students to choose their teams, but give them specific parameters, such as
 - the maximum number in a group,
 - the deadline to finalize teams,
 - guidance on choosing people with whom they work well.
 - process for handling disputes regarding team member selection. For example, I required that all students involved come to a consensus before I permitted any changes in team members. Consensus building and self-advocacy are important life skills for middle school students to practice.
- Construct the game so that grades will not be negatively impacted by a team’s lack of work so as not to punish individual students who are working. For example, students who completed the classwork assignment received their grade for that assignment even if their team members did not finish their work. However, teams only scored classwork points if all members completed the assignment.
- Assess your student’s capacity for cooperative group work by running some practice group activities ahead of the gamification launch. Weave in team-building activities as necessary.

APPENDIX B

INTERVENTION ALIGNMENT WITH STUDENT ENGAGEMENT INSTRUMENT

Table B-1

Alignment of Team Challenges and Intervention Guidelines with SEI Dimensions

SEI Survey Question (Appleton et al., 2006)	Team Challenge					Intervention Guideline					
	Setting the Table: Set up four place settings as fast as possible	Chopstick: Get 10 plastic food items into a bowl in 1 min	Students choose their own teams of 4-5	Teams can't change over 4 weeks	Teams earn 1 point when all members meet the daily work completion target	Absent members don't count	Teacher tracks completed work on clipboard and updates the leader-board daily	Teacher serves as umpire; a team rep. can present an argument if points are considered unfairly assigned	Teacher demonstrates each challenge to model humility and answer questions	Points are never removed from the leader-board	Teacher serves as technical assistance, answering questions and providing further explanation when necessary
<i>Dimension 1: Teacher-student relationships</i>											
1. Overall, adults at my school treat students fairly.							1	1	1	1	1
2. Adults at my school listen to the students.						1	1	1	1		1
3. At my school, teachers care about students.							1	1	1	1	1
4. My teachers are there for me when I need them.							1	1	1		1
5. The school rules are fair.							1	1	1	1	1
6. Overall, my teachers are open and honest with me.								1	1		1
7. I enjoy talking to the teachers here.								1	1		1
8. I feel safe at school.										1	1
9. Most teachers at my school are interested in me as a person, not just as a student.	1	1				1		1	1		1
											Dimension 1 total: 38

Table B-1 Continued

SEI Survey Question (Appleton et al., 2006)	Team Challenge					Intervention Guideline					
	Setting the Table: Set up four place settings as fast as possible	Chopstick: Get 10 plastic food items into a bowl in 1 min	Students choose their own teams of 4–5	Teams can't change over 4 weeks	Teams earn 1 point when all members meet the daily work completion target	Absent members don't count	Teacher tracks completed work on clipboard and updates the leader-board daily	Teacher serves as umpire; a team rep. can present an argument if points are considered unfairly assigned	Teacher demonstrates each challenge to model humility and answer questions	Points are never removed from the leader-board	Teacher serves as technical assistance, answering questions and providing further explanation when necessary
<i>Dimension 2: Control and relevance of schoolwork</i>											
10. The tests in my classes do a good job of measuring what I'm able to do.											
11. Most of what is important to know you learn in school.	1	1									
12. The grades in my classes do a good job of measuring what I'm able to do.											
13. What I'm learning in my classes will be important in my future.	1	1									
14. After finishing my schoolwork, I check it over to see if it's correct.	1	1									
15. When I do schoolwork, I check to see whether I understand what I'm doing.											
16. Learning is fun because I get better at something.	1	1					1				
17. When I do well in school, it's because I work hard.					1	1	1		1	1	1
18. I feel like I have a say about what happens to me at school.	1	1			1	1	1	1	1	1	1
Dimension 2 total: 24											

Table B-1 Continued

SEI Survey Question (Appleton et al., 2006)	Team Challenge					Intervention Guideline					
	Setting the Table: Set up 4 place settings as fast as possible	Chopstick: Get 10 plastic food items into a bowl in 1 min	Students choose their own teams of 4–5	Teams can't change over 4 weeks	Teams earn 1 point when all members meet the daily work completion target	Absent members don't count	Teacher tracks completed work on clipboard and updates the leader-board daily	Teacher serves as umpire; a team rep. can present an argument if points are considered unfairly assigned	Teacher demonstrates each challenge to model humility and answer questions	Points are never removed from the leader-board	Teacher serves as technical assistance, answering questions and providing further explanation when necessary
<i>Dimension 3: Peer support for learning</i>											
19. Other students at school care about me.	1	1	1	1	1	1					
20. Students at my school are there for me when I need them.	1	1	1	1	1						
21. Other students here like me the way I am.			1	1							
22. I enjoy talking to the students here.	1	1	1	1							
23. Students here respect what I have to say.			1	1	1	1					
24. I have some friends at school.	1	1	1	1	1	1					
											Dimension 3 total: 27
<i>Dimension 4: Future aspirations and goals</i>											
25. I plan to continue my education following high school.											
26. Going to school after high school is important.											
27. School is important for achieving my future goals.	1	1									
28. My education will create many future opportunities for me.											
29. I am hopeful about my future.	1	1									
											Dimension 4 total: 4

Table B-1 Continued

SEI Survey Question (Appleton et al., 2006)	Team Challenge					Intervention Guideline					
	Setting the Table: Set up 4 place settings as fast as possible	Chopstick: Get 10 plastic food items into a bowl in 1 min	Students choose their own teams of 4–5	Teams can't change over 4 weeks	Teams earn 1 point when all members meet the daily work completion target	Absent members don't count	Teacher tracks completed work on clipboard and updates the leader-board daily	Teacher serves as umpire; a team rep. can present an argument if points are considered unfairly assigned	Teacher demonstrates each challenge to model humility and answer questions	Points are never removed from the leader-board	Teacher serves as technical assistance, answering questions and providing further explanation when necessary
<i>Dimension 5: Family support for learning</i>											
30. My family/ guardian(s) are there for me when I need them.											
31. When I have problems at school, my family/guardian(s) want to know about it.											
32. When something good happens at school, my family/guardian(s) want to know about it.											
33. My family/ guardian(s) want me to keep trying when things are tough at school.											
Dimension 5 total: 0											
<i>Dimension 6: Extrinsic motivation</i>											
34. I'll learn, but only if my family/ guardian(s) give me a reward. (Reversed)											
35. I'll learn, but only if the teacher gives me a reward. (Reversed)											
Dimension 6 total: 0											

APPENDIX C

STUDENT ENGAGEMENT INVENTORY PRETEST/POSTTEST DATA

Table C-1

Pretest/Posttest Data for All Three Subresearch Questions

Student	Black / African American					Hispanic / Latino/a					All Students				
	<i>p</i> value	<i>t</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>p</i> value	<i>t</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>p</i> value	<i>t</i>	<i>N</i>	<i>M</i>	<i>SD</i>
Male	< .001	4.40				.108	1.24				< .001	4.63			
pretest			47	2.07	0.88			18	2.19	0.84			73	2.12	0.87
posttest			49	1.91	0.88			16	2.11	0.90			71	1.98	0.88
Female	< .001	2.71				.012	2.25				< .001	4.08			
pretest			47	2.18	0.86			21	2.21	0.82			77	2.18	0.83
posttest			42	2.08	0.79			21	2.10	0.72			72	2.07	0.76

Table C-2

Pretest/Posttest Data for Subresearch Question 1 (Items 1–9)

Student	Black / African American					Hispanic / Latino/a					All Students				
	<i>p</i> value	<i>t</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>p</i> value	<i>t</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>p</i> value	<i>t</i>	<i>N</i>	<i>M</i>	<i>SD</i>
Male	.039	1.76				.494	0.02				.019	2.08			
pretest			47	2.10	0.83			18	2.27	0.82			73	2.18	0.84
posttest			49	1.99	0.93			16	2.26	0.88			71	2.08	0.88
Female	.306	0.51				.280	0.58				.239	0.71			
pretest			47	2.25	0.79			21	2.28	0.79			77	2.25	0.77
posttest			42	2.22	0.77			21	2.24	0.61			72	2.22	0.72

Table C-3*Pretest/Posttest Data for Subresearch Question 2 (Items 10–18)*

Student	Black / African American					Hispanic / Latino/a					All Students				
	<i>p</i> value	<i>t</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>p</i> value	<i>t</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>p</i> value	<i>t</i>	<i>N</i>	<i>M</i>	<i>SD</i>
Male	.047	1.68				.196	0.86				.044	1.71			
pretest			47	1.95	0.87			18	2.12	0.83			73	1.99	0.85
posttest			49	1.85	0.84			16	2.03	0.98			71	1.91	0.87
Female	.107	1.24				.212	0.80				.021	2.04			
pretest			47	1.93	0.77			21	2.10	0.83			77	1.98	0.77
posttest			42	1.87	0.68			21	2.04	0.71			72	1.90	0.69

Table C-4*Pretest/Posttest Data for Subresearch Question 3 (Items 19–24)*

Student	Black / African American					Hispanic / Latino/a					All Students				
	<i>p</i> value	<i>t</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>p</i> value	<i>t</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>p</i> value	<i>t</i>	<i>N</i>	<i>M</i>	<i>SD</i>
Male	< .001	4.53				.081	1.40				< .001	4.61			
pretest			47	2.21	0.96			18	2.17	0.89			73	2.21	0.92
posttest			49	1.86	0.85			16	2.00	0.79			71	1.93	0.85
Female	< .001	3.05				.005	2.61				< .001	4.47			
pretest			47	2.44	0.98			21	2.26	0.85			77	2.38	0.92
posttest			42	2.19	0.90			21	1.98	0.84			72	2.11	0.87

APPENDIX D

PARENT INFORMATION LETTER

Dear Parents,

Our school seeks to continuously improve the way we teach your student. To that end, students in Ms. Kelly's Career Investigations classes will be participating in a new way of conducting class where each student chooses a team to work with for four weeks. Each class period, the teams in each class will earn points by finishing their classwork. If all of the team members complete their assignment that day, the team will be awarded points. Also, teams will have the option to compete in fun team challenges. The team with the most points at the end of the four weeks will earn a pizza lunch party.

Before we begin this new way of learning, we will take the Student Engagement Inventory, 35 questions where students rate how engaged they feel in school. At the end of the four weeks, students will take the SEI again to see if there is any change in how they feel after we try out this new method. No identifiable information will be collected from any student. The online questionnaire only asks for the gender, ethnicity, age and grade, so the answers are completely anonymous. The results will only be used to improve teaching and learning at our school.

Please contact Ms. Kelly by email or by phone if you have any questions or concerns. Thanks so much for your support.

-Ms. Toni Harrison-Kelly