TEACHING WITH TABLES: A CASE STUDY INVESTIGATING AFFECTIVE AND PSYCHOMOTOR RESPONSES IN HIGH SCHOOL STUDENTS AND TEACHERS

by

Johanna Wegner Herndon

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

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ABSTRACT

This exploratory, collective case study investigated the affective and psychomotor conditions in high school students and teachers when tables and chairs were used in classrooms instead of traditional desks. The experiences of students, teachers, and administrators were examined by investigating attitudes toward the educational process, student and teacher self-efficacy, community-building, and classroom environmental dynamics. Students (n=59) and teachers (n=3) from three classrooms (language arts, math, and social studies) in a Southeastern public high school served as participants. Administrators (n=3) also participated to provide additional perspectives to the study. Data was collected using documents, archival records, interviews, direct and participant observations, and physical artifacts. All data was analyzed in relation to the constructs previously mentioned. Data analysis procedures included pattern matching, explanation building, time-series analysis, logic models, and cross case synthesis. It was found that the decision to use tables exclusively in core classrooms was primarily based on teacher preference and teaching style. Positive implications for table use included increased student self-efficacy, the creation of table communities, and a more pleasing classroom environment; however, detrimental issues related to using tables also arose. A narrative analysis is offered to present additional findings and discuss the results of the study.

Keywords: tables versus desks, affective, psychomotor, attitude, self-efficacy, community-building, environment

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Dedication

I humbly and graciously offer my thanksgiving to God for providing me this opportunity and a path by which to see it through. I pray that He will continue to bestow upon me gifts to be used in the development of His Kingdom.

I dedicate this work first to my daughter, Sienna, with hope that she would learn from my example of hard work and contribution to others. Secondly, it is my prayer that this research would encourage other teachers to seek new ways to reach and teach our most precious resource for the future. Finally, I would like to dedicate this research to all single working mothers, who in the face of adversity might be encouraged to persevere.

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I would like to thank Liberty University and its staff for upholding a commitment to Christ through the incorporation of a biblical worldview in every endeavor associated with this doctoral program.

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List of Abbreviations

Adequate Yearly Progress (AYP)

English Language Learner (ELL)

English as a Second Language (ESL)

Institutional Review Board (IRB)

National Bureau of Economic Research (NBEC)

No Child Left Behind (NCLB)

Obsessive Compulsive Disorder (OCD)

Psychological Sense of Community (PSOC)

Smaller Learning Communities (SLC)

Student Teams Achievement Divisions (STAD)

CHAPTER ONE: INTRODUCTION

There is a duality that persists within the American institution of education. One side has been determined to combat low achievement, dropout rates, and global vulnerability over the past two decades. Most notable and unpopular at best, the No Child Left Behind Act (NCLB) (2001) has garnered national success through federal strong arm tactics. In its attempt to level the international landscape by requiring standard achievement for all students by 2014, this legislation has not only forced schools to prove their worth, but also provided non-traditional avenues by which to achieve its goals. Students can now choose from a variety of educational formats—public schools, charter schools, magnet schools, virtual schools, online schools, or home schools. This choice, in combination with the proactive mandates of the law, helped to lower the national dropout rate by 5% (National Center for Educational Statistics, 2010) and narrowed the achievement gap for many marginalized students. While this is partially good news, it must also be noted that amid this atmosphere of stringent regulation, the nation collapsed financially into recession in 2007 (National Bureau of Economic Research, 2008), causing federal, state, and local education budgets to plummet. For the past several years, teachers have been faced with a multi-faceted struggle—do more with less. At no time has it been more important to utilize innovative classroom strategies that are cost effective. Unfortunately, instructors are caught between what they want to do for their students and what administrators will permit them to do.

The other side of the American educational system is steeped in tradition. The foundational structures and processes that historically set the United States apart from the rest of the world have become outdated, yet many educators cling to these Jeffersonian

ideals. Even though it is clear that changes are warranted to accommodate 21st century needs, leaders continue to rely on conventional modes of rearing children academically and socially. Part of the problem is that most schools are a branch of the public sector and shifts in this arena are slow. Additional barriers to modernization include lack of funding and administrative red tape. One area that continues to lag in pioneering attempts specifically is physical school structure. Designs for educational buildings and classrooms remain relatively equivalent to those from the previous century. American students continue to report daily to outmoded classrooms with four walls and rows of desks. Many of these facilities are in a state of disrepair that negatively impacts students (Grana, et al., 2010; Plank, Bradshaw, & Young, 2009; Uline, Wolsey, Tschannen-Moran, & Lin, 2010).

Fortunately, public school teachers, particularly at the secondary level, are passionate toward their art and resilient to outside forces. Their steadfast commitment to their students and their craft naturally encourages the incorporation of inventive classroom strategies. Little research has been done to uncover the effects of structural transformations in high school educational settings, but investigation into this aspect is certainly warranted. One consideration is the use of tables and chairs instead of desks. The continued use of traditional desks is restrictive to both teachers and students (Douglas & Gifford, 2001; Kennedy, 2006; Khaspuri, Sau, & Dhara, 2007; Saarni, Nygard, Rimpela, Nummi, & Kaukiainen, 2007). Consequently, the use of tables and chairs in the place of desks in a high school classroom is a simple and cost effective strategy that may provide a considerable return. To provide foundational viability in this regard, this study explored the affective and psychomotor responses of students and

teachers when tables were used exclusively in core classrooms other than science. The presentation of this research follows a linear-analytical structure which includes the remainder of the introduction, a review of the literature, methodology, findings, and discussion (Yin, 2009, p. 176). Background on related research and the researcher are provided next, as well as a discussion of the problem, purpose, significance, and questions for the study. The research plan and delimitations are also addressed.

Background

Current research indicates that students' emotional and physical conditions can affect their academic achievement. Student attitude toward learning has been found to influence achievement in core subjects (Cakici, Aricak, & Ilgaz, 2011; Hemmings, Grootenboer, & Kay, 2011; Jackman, Townsend, & Hamilton, 2011). Similarly, student self-efficacy has been linked to academic success (Caprara, Vecchione, Alessandri, Gerbino, & Barbaranelli, 2011; Skaalvik & Skaalvik, 2011). Additionally, student performance can be positively impacted through the use of community-building activities (Booker, 2008; Davis, Chang, Andrzejewski, & Poirier, 2010; Yasuda, 2009). Environment also plays a part in successful student behavior and achievement (Berg, Segers, & Cillessen, 2012; Wannarka & Ruhl, 2008). The use of tables and chairs in elementary classrooms is a relatively standard practice, mostly through the use of learning centers or stations. Many grade school children receive instruction or work on activities at a table for at least part of the school day (Bulunuz & Jarrett, 2010; Peterson & Davis, 2008). Additionally, colleges and universities have recognized the need to transform traditional rows of desks into more practical and active learning environments that include swivel seats, spacing, and tables (Ogilvie, 2008; Taylor, 2009; Veltri,

Banning, & Davies, 2006). There is, however, no current research that examines how the use of tables and chairs instead of desks in high school classrooms is related to achievement, or more specifically the above mentioned affective and psychomotor constructs. By examining first the relationships between the use of tables and concepts such as attitude, self-efficacy, community, and classroom environmental dynamics, an empirical foundation can be established to allow for a more definitive line of future research that explores connections between the use of tables in high school classrooms and achievement.

Educators are continually looking for ways to keep up with the demands of modernization and globalization. More and more, teachers are moving away from traditional structures that limit their ability to implement innovative strategies that address the current needs of students. Technology is an integral aspect of this transition. The few physical and environmental changes to today's classrooms typically involve the inclusion and use of computers (Higgins, Mercier, Burd, & Hatch, 2011; Zoetewey, 2009). While these changes often utilize tables, the tables are designed specifically to conform to the convenient use of computers. These new types of furniture and classroom arrangements, most often seen in lab or university settings, do not address the topic of this study. In reaction to the current need for critical thinking skills in the workplace, educational research has also focused greatly on cooperative learning strategies. May and Doob (1937) found that when people worked together they were more successful at achieving outcomes. Since then, cooperative learning has evolved into an everyday strategy utilized by most teachers. A plethora of cooperative learning techniques are now available for instructors to incorporate into their lessons (Kagan, 1994; Schul, 2011).

Most recently, research has specifically linked the use of cooperative learning to higher test scores at the university level (Tsay & Brady, 2010). While many teachers use cooperative learning, they typically move individual desks into clusters for certain activities. In this way, the grouping of students is a strategy, not necessarily a permanent environment as is created with the daily use of tables and chairs. Empirical research of table-exclusive classrooms would provide specific data to establish the difference between these two types of classrooms, allowing educators to make informed decisions to more specifically meet the needs of their students.

Several theories contribute to the prospective effects of using tables in a high school classroom. In *Democracy and Education: An Introduction to the Philosophy of Education*, Dewey (1916) outlined a genuine sense of community in three stages: common sharing, communication, and community itself. In stage one, a group shares common objects and pursues common activities. This develops into what is called the "we feeling" and is associated with the prevention of isolation of individuals, instead promoting enriched social intelligence (Gutek, 2005, p. 346). Gibson's (1979) *Ecological Theory of Perceptual Development* also contributes to the theoretical perspective surrounding the use of tables. The author developed the ideal of affordances—what the environment offers or provides to an organism and the resulting relationship between the two (Miller, 2011, p. 380). Finally, Bandura's (1977) *Social Cognitive Theory* is also significant in that it provides a foundational understanding that behavior can be learned through the observation of others. Each theory addresses an important aspect of the communal atmosphere created through the use of tables in a classroom instead of individual desks.

With the abundance and longstanding nature of cooperative theory and research, it is curious as to why more educators do not use tables in their classrooms. This problem may simply rest in teachers' individual preferences or may be linked to more corporate barriers like funding or testing regulations. Regardless, the lack of research on the use of tables in high school settings necessitates the current study. It is pragmatic for high school educators to realize what connections might exist between students' affective and psychomotor responses in relation to the use of tables, and moreover, the possible correlation to achievement.

Situation to Self

As a secondary school educator, my philosophy relies heavily on a combination of rhetorical and axiological goals, particularly those that exemplify real world applications. I know that when my students leave me they head out into the work force or on to college. I started using tables and chairs in my high school language arts classroom six years ago to provide my students with a richer and more realistic learning experience. I also wanted to try it because I continually felt restricted physically and strategically by the use of individual desks. Additionally, because I teach older children, I sympathized with many of my larger students who were made uncomfortable by sitting in desks. Since the inception of my use of tables, three other teachers in my school have switched to tables—one in language arts, one in math, and one in social studies. I wanted to research the specific experiences of the other instructors, the administration, and most importantly, the experiences of the students. As previously indicated, several affective and psychomotor constructs are empirically linked to achievement. A quantitative study might show the direct connections between the use of tables and achievement, but this

type of research would continue to leave a gap in terms of exactly how the tables affect student performance. This scenario creates the proverbial "cart before the horse" concept. Instead, I was first concerned with understanding how constructs such as attitude, self-efficacy, community, and classroom environment are influenced through the use of tables. This study establishes an empirical foundation upon which to build future research on the use of tables, in order to specifically address how or under what conditions the use of tables might be related to achievement. Identifying the impact of tables on each of these constructs provides integral data for more targeted and thorough research on this topic. My role in the research process was strictly limited to the collection of data through observations, interviews, and documentation, and the interpretation of such.

Problem Statement

The problem is that in most core subject high school classrooms, the use of traditional desks has become restrictive to both students and teachers. Desks are physically uncomfortable for students (Douglas & Gifford, 2001; Khaspuri, et al., 2007; Saarni, et al., 2007) and provide little work space or opportunities for collaboration (Veltri, et al., 2006; Wannarka & Ruhl, 2008) or a sense of community (Yasuda, 2009). The use of desks also hampers a teacher's ability to implement effective and authentic strategies, activities, and assessments that engage students on an emotional or physical level. Teachers who create environments that capitalize on cooperation, like the ones established through the use of tables, build a sense of trust and safety for students (Booker, 2008). While research has been conducted on the use of tables in elementary schools (Bulunuz & Jarrett, 2010; Peterson & Davis, 2008) and at universities (Ogilvie, 2008; Taylor, 2009; Veltri, et al., 2006), little research exists to determine how students

and teachers are affected through the use of tables in public high school classrooms. Traditionally, tables have only been used in science classes where space and collaboration are often a necessity in order to conduct experiments. These same concepts should be considered for other core subject areas like language arts, math, and social studies.

Purpose Statement

The purpose of this exploratory (Yin, 2009), collective (Stake, 1995, 2006) case study was to investigate the affective and psychomotor conditions experienced by students and teachers when tables and chairs were used instead of desks in a variety of core subject classrooms at a public high school in the Southeastern United States. This research investigated the role of tables in relation to student attitudes, self-efficacy, community-building, and environmental dynamics, all of which are empirically linked to academic achievement.

Significance of the Study

This study is significant in that it offers insight into a strategy that is both simple and cost effective to implement. More importantly, this research is necessary to examine the affective and psychomotor conditions created for students and teachers by using tables in high school core classrooms. There are empirical links between achievement and such constructs as attitude (Cakici, et al., 2011; Hemmings, et al., 2011; Jackman, et al., 2011), self-efficacy (Caprara, et al., 2011; Skaalvik & Skaalvik, 2011), community-building (Booker, 2008; Davis, et al., 2010; Wighting, Nisbet, & Spaulding, 2009; Yasuda, 2009), and environmental conditions (Berg, et al., 2012; Wannarka & Ruhl, 2008), but research has not previously addressed whether or not these factors can be

positively influenced through the use of tables. This research also helped to identify problematic issues related to the use of tables that otherwise may be overlooked. Pragmatically, the information garnered in this study allows educators to hone the use of tables to maximize the benefits and minimize the drawbacks.

Theoretically, group dynamics have a longstanding connection to academic success. Dewey's (1916) ideas concerning Experientialism and Environmentalism certainly contribute to the discussion, as well as Gibson's (1979) Ecological Approach which includes the notion of *affordances*. Bandura's (1977) Social Learning Theory also provides ideals which lend to the conceptual framework. The findings of this study contribute to this theoretical base of communal learning and to the current literature associated with this topic.

This research also provides the specific data necessary to determine if indeed the use of tables affords a contributing effect to attitude, self-efficacy, community-building, or environmental dynamics, all of which surround student achievement. The use of three different core subject classrooms also provided a broader scope of findings for the purpose of credibility and replication of research.

Research Questions

The research questions that guided this study are as follows:

1. *What are the experiences of high school students and teachers when tables and chairs are used in a classroom instead of traditional desks?*

   The use of tables instead of desks in high school classrooms is rare, and little research has been conducted to analyze what effects their use may have on students and teachers. This question led to a better understanding of these effects

on students and teachers and how they impact the educational environment and learning.

2. *How does the use of tables and chairs instead of traditional desks affect student and teacher attitudes toward the educational process?*

   Because student and teacher attitudes to learning have been found to impact achievement (Cakici, et al., 2011; Hemmings, et al., 2011; Jackman, et al., 2011), it was important to explore what role tables have in conjunction with this construct.

3. *How does the use of tables and chairs instead of traditional desks affect student and teacher performance self-efficacy?*

   Because student and teacher performance self-efficacy have been found to impact achievement (Caprara, et al., 2011; Skaalvik & Skaalvik, 2011), it was important to explore what role tables have in conjunction with this construct.

4. *What are the possible community-building implications of using tables and chairs instead of traditional desks?*

   Because community-building has been found to impact achievement (Booker, 2008; Davis, et al., 2010; Yasuda, 2009), it was important to explore what role tables have in conjunction with this construct.

5. *What physical environmental dynamics are present in a classroom that utilizes tables and chairs instead of traditional desks?*

   Because physical learning environment has been found to impact achievement (Berg, et al., 2012; Wannarka & Ruhl, 2008), it was important to explore what role tables have in conjunction with this construct.

Research Plan

This qualitative research was conducted as an exploratory (Yin, 2009), collective (Stake, 1995, 2006) within-site case study. This design was appropriate as three bounded systems were investigated using multiple sources of information (Creswell, 2007, p. 73). To reinforce triangulation, the cases were three core subject classrooms—language arts, math, and social studies. Purposeful maximal sampling (Creswell, 2007, p. 75) was used initially to identify student participants. Stratified purposeful sampling (Patton, 1990) was used to finalize the student sample. Criterion sampling (Patton, 1990) was used to obtain the teacher and administrator samples. Data was collected using a variety of methods, and procedures were replicated for each case (Yin, 2009). Yin's (2009) analysis techniques were utilized to interpret data. Careful consideration was also given to establish trustworthiness and ethical applications to the study.

Delimitations

Several delimitations were applied to the study. First, to bracket out (Merriam, 1988) my own experiences and to prevent bias, I did not use my own classroom or students to collect data. Additionally, I did not use any students in the sample who had received instruction from me in the past or potentially would in the future. Furthermore, to prevent undue influence, I refrained from discussing my relevant past experiences with the students, teachers, and administrators participating in the study. I also limited my exposure within the classrooms as much as possible during data collection so as not to affect or contribute to the dynamics. Secondly, criterion sampling (Patton, 1990) was used to establish a sample that included teachers and administrators that had at least two years of experience with the use of tables. This helped to establish a broad spectrum of

situations upon which to draw data. For this same reason, data was collected from students after they had received an entire school year of instruction to also allow for a breadth of student experiences. Additionally, interviews were conducted individually to prevent cross-sample influence in order to ensure reliability of the data. Also, all data was collected in the natural setting for optimal accuracy and to provide points of reference for the participants.

My position as a teacher at the site of the study was a limitation to the research. However, the uniqueness of the site in providing all three core subject classrooms opposite science (language arts, math, and social studies) provided a strong rationale for the location. Every consideration to bracket out (Merriam, 1988) my own experiences was made. Additionally, there were limitations in transferability in that only high school cases were used, and specifically those located in the southeastern United States.

CHAPTER TWO: LITERATURE REVIEW

Title I of the No Child Left Behind Act ([NCLB], 2001) requires all children in elementary and secondary schools to obtain proficiency on state achievement standards and academic assessments by 2014. Beginning in the third year of its enactment, state schools were required to make adequate yearly progress (AYP) towards this goal (NCLB, 2001). This federal legislation generated a new focus for public educators by creating an atmosphere of accountability nationwide. In addition, schools have also felt the pressure to modernize educational practices through the use of updated technology, whether it be in their libraries (Martin, Westmoreland & Branyon, 2011), classrooms (Higgins, Mercier, Burd & Hatch, 2011; Zoetewey, 2009), or exhibited through teacher proficiency (Shapeley, Sheehan, Maloney & Caranikas-Walker, 2010). This challenging educational climate became exacerbated in 2007 when the United States entered a recession (National Bureau of Economic Research [NBER], 2008). The cumulative effect of these factors has called for educators to transform their schools and classrooms, albeit with limited resources. There is no better time than now for schools to examine non-traditional means by which to satisfy impending federal mandates.

Educators should consider the physical environments of their schools. A positive overall impression of a school can be correlated to achievement (Tanner, 2000). Conversely, schools with outdated structures or inadequate facilities can adversely affect students. Uline, Wolsey, Tschannen-Moran and Lin (2010) found:

> Students, teachers, parents, and community members initially come to understand the primary functions of school through their observations of the buildings and

> grounds. Occupants struggle to perceive a clear focus on academics when the facility is architecturally substandard or poorly maintained. (p. 597)

Inadequately preserved schools can even contribute to a climate of disorder, fear, and collective inefficacy (Plank, Bradshaw & Young, 2009). In extreme cases, the condition of a school can be linked to student drug use (Grana et al., 2010). Not only is upkeep a problem, but too little emphasis has been placed on how schools are planned, designed, and built (Tanner, 2000). Specific facility designs have even been found to influence student outcomes which include achievement (Tanner, 2009). Consequently, individual classrooms become an integral part of an environment that is linked with achievement. Because of this, these spaces need to be tailored more directly in consideration of their users. "An important goal of classroom design is to create a space that students and educators like. This rather obvious goal has not received the attention it deserves" (Douglas & Gifford, 2001, p. 296). While many school districts cannot likely afford to update their facilities, smaller changes within the classroom may provide a considerable payoff. Research suggests that students prefer rooms that have comfortable seating (Douglas & Gifford, 2001; Khaspuri et al., 2007; Saarni et al., 2007). Both students and teachers prefer seating that allows for interaction between students (Douglas & Gifford, 2001; Veltri et al., 2006). Kennedy (2006) suggested that the use of the appropriate desks, tables, and chairs in a classroom can actually improve the educational environment and help students maintain focus, yet many schools continue to use desks and chairs that do not match their students' needs.

Colleges and universities have begun to explore the need to transform traditional classroom settings. Dittoe and Porter (2007) speculated that declining retention and

graduation rates have influenced administrators, faculty, and planners to recognize that learning spaces should be developed that appeal to students and foster learning. Physical aspects such as size, shape, lighting, furniture, and its arrangement have been found to impact learning in college students (Lei, 2010). Ogilvie (2008) found that the simple inclusion of swivel seating in a lecture hall enhanced student discussion and overall performance scores. Research also indicates that open space has a positive effect on student perceptions of the classroom environment (Taylor, 2009; Veltri et al., 2006). Physical environment and furniture design innovation also seem to have worked their way into elementary classrooms. Given enough space and the appropriate furnishings, the incorporation of hands-on learning stations for science has been found to influence achievement in elementary students (Bulunuz & Jarrett, 2010). Similar work stations used for writing contributed to positive student perceptions of learning at the elementary level (Peterson & Davis, 2008). In reaction to the concern for childhood obesity, Benden, Blake, Wendel, and Huber (2011) used stand-sit workstations in first-grade classrooms to encourage student movement, finding that not only did the treatment have a positive effect on calorie expenditure, but it also had a positive effect on child behavior and classroom performance.

While innovation pertaining to the physical dynamics in elementary and college classrooms is on the rise, little to no advancement has surfaced in this area relative to high schools. Overwhelmingly, secondary classrooms continue to utilize traditional settings that include rows of desks. This is particularly the case in core subjects other than science. Typically, science classrooms include lab tables for the purpose of conducting experiments. Some of these classrooms are even designed to accommodate the

differences between lab sciences like earth science, biology, physics, and chemistry (Duncanson & Achilles, 2008). However, the core subject classrooms of language arts, math, and social studies have been overlooked in terms of implementing structural changes that would include furniture such as tables. The purpose of this study was to explore the role of tables and chairs in high school core subject classrooms in relation to several constructs empirically linked to achievement. This chapter includes a theoretical framework which presents the philosophies of Dewey (1916), Gibson (1979), and Bandura (1977). A review of the literature follows, detailing the constructs of student attitude, student and teacher self-efficacy, community building, and physical environmental dynamics.

Theoretical Framework

This study examined the affective and psychomotor responses of students and teachers when tables and chairs were used in high school classrooms instead of desks. Affective response typically involves attitudes, motivation, and values (Miller, 2005), but Dettmer (2006) suggests that in addition to feelings and attitudes, the affective domain can also include internalization, wonder, and risk taking. Psychomotor response involves physical movement (Bloom, 1956), which may also be expanded into the sensorimotor domain, to include the five senses along with balance, spatial relationships, movement, and other physical activity (Dettmer, 2006). The consideration of these learning domains was combined with several learning theories to establish the conceptual framework for the study. The following theories were incorporated—Dewey's (1916/2011) ideas of experimentalism and environmentalism, Gibson's (1979) Theory of Affordances, and

Bandura's (1977) Social Learning Theory, which was later renamed Social Cognitive Theory and will henceforth be referred to as such.

Dewey's Philosophy of Education

In *Democracy and Education*, Dewey (1916/2011) expressed his foundational philosophy of education. He described education as a necessary social function of any democracy, specifically because two of his criterion for effective schooling point to a democratic way of life—(a) a shared common interest of members, and (b) interaction between smaller social groups (Dewey, 1916/2011, Chapter 7). Within the text, Dewey (1916/2011) elaborated on various general tenets of education to include curriculum, methods, discipline, values, and vocation. He also noted that traditional educational methods focused on the classical conveyance of individual and unrelated "studies" of the mind which lacked opportunities for practical application in a real environment (Dewey, 1916/2011, pp. 75-76). Two aspects of his philosophy are particularly relevant to the current study—experimentalism and environmentalism.

Experimentalism. Experimentalism relies heavily on activities aimed at a realistic application of learning. Education that incorporates this ideal often includes the use of objects, movement, and possibly linear trial and error techniques like the scientific method. Deciding what experiences are most vital can be a challenge. These experiences consist of a variety of different domains, or interests, each having its own independent value, material, and method, each checking every other and together forming a "balance of powers" in education (Dewey, 1916/2011, p. 176). Because of this, educators must choose what experiences are most important in terms of societal needs and norms. Dewey (1916/2011) believed that, in addition to the narrow disciplines of study,

education should be organized so that natural active tendencies of society would be fully enlisted at school, while seeing to it that the doing required observation, the acquisition of information, and the use of a constructive imagination—all for the purpose of improving certain social conditions (p. 76). In this way, learning becomes not only an academic process, but also a contribution to social maintenance or even reform. Dewey (1916/2011) also noted that this reorganization of education where learning takes place in connection with the intelligent carrying forward of purposeful activities is "slow work" (p. 77). This is likely due to competition of societal ideals. Dewey (1916/2011) viewed activities as having dualism or antitheses—labor and leisure, practical and intellectual activity, man and nature, individuality and association, and culture and vocation (p. 176). Thus, the inclusion of experimentalism in educational practice requires time, space, materials, and a high level of decision making in terms of subject matter. These considerations may be difficult for high school educators to incorporate into their classrooms, especially when choices about time and space are not an option.

Environmentalism. In education, environmentalism concerns the relationship between a student and the school environment. This can include a range of physical factors from a school's campus—the grounds, the layout of the building, or the size and organization of individual classrooms. Sometimes referred to as milieu, a school's environment can also be examined to include dynamics related to social climate: cultural groups, societal norms, or community traditions or practices. Dewey (1916/2011) noted particular interest to the physical dynamics of the educational environment, describing environmentalism as a reciprocal relationship between students and their surroundings (p. 177). Additionally, Dewey (1916/2011) argued that in traditional practices a fundamental

separation exists between mind and activity involving physical conditions, bodily organs, material appliances, and natural objects, indicating a standard practice that recognizes the origin, place, and function of mind in an activity which controls the environment (p. 177). This suggests that conventional educational methods acknowledge a student's influence over their surroundings, but leaves little consideration for the opposite. Dewey (1916/2011) claimed:

> In truth, experience knows no division between human concerns and a purely mechanical physical world. Man's home is nature; his purposes and aims are dependent for execution upon natural conditions. Separated from such conditions they become empty dreams and idle indulgences of fancy. From the standpoint of human experience, and hence of educational endeavor, any distinction which can be justly made between nature and man is a distinction between the conditions which have to be reckoned with in the formation and execution of our practical aims, and the aims themselves. This philosophy is vouched for by the doctrine of biological development which shows that man is continuous with nature, not an alien entering her processes from without. (p. 156)

In this way, an interactive relationship exists between people and their environment. Applied to a classroom, students would tend to exhibit a certain amount of control over their surroundings, but they would also be greatly affected by them in ways that may be out of their control. This regular exchange likely creates a dynamic that becomes part of a student's ongoing educational process.

Theory of Affordances

Gibson (1979) described the environment as the surfaces that separate substances from the medium in which animals live (p. 127). These surfaces are originally found in nature, but theoretically transcend to human-made objects that are part of a person's daily experience. In addition to identifying environmental surfaces, Gibson (1979) considered what they would enable people to do with them, calling them *affordances*. "The *affordances* of the environment are what it *offers* the animal, what it *provides* or *furnishes*, either for good or ill" (Gibson, 1979, p. 127). In so saying, humans make use of what is available conveniently through the environment or what is provided consequentially by others. Additionally, "different layouts afford different behaviors for different animals, and different mechanical encounters" (Gibson, 1979, p. 128). Gibson (1979) contended that if a surface has the following four properties—nearly horizontal, nearly flat, sufficiently extended, and has a rigid substance, then it affords support (p. 127). This is also noted in his examination of a seat:

> The human species in some cultures has the habit of sitting as distinguished from kneeling or squatting. If a surface of support with the four properties is also knee-high above the ground, it affords sitting on. We call it a *seat* in general, or a stool, bench, chair, and so on, in shapes, as long as its functional layout is that of a seat. (Gibson, 1979, p. 128)

In addition to serving a purpose, an *affordance* becomes relational. Like Dewey (1916/2011), Gibson (1979) noted a two-directional interaction between the environment and its observer, claiming that both a physical and a psychical effect can be created (p. 129). In so saying, a seat becomes something more than just an object to sit on. Gibson

(1979) also maintained that people tend to change the shapes and substances of the environment to change what it affords, making more prevalent the benefit and less pressing what causes injury (p. 128). This is also true of moveable objects. Gibson (1979) explained:

> Detached objects must be comparable in size to the animal under consideration if they are to afford behavior. But those that are comparable afford an astonishing variety of behaviors, especially to animals with hands. Objects can be manufactured and manipulated. Some are portable in that they afford lifting and carrying, while others are not. (p. 133)

Together, these aspects of the theory demonstrate a strong application to a classroom setting, where the ability for students and teachers to change their surfaces and objects could indicate a wider range of *affordances*.

Gibson (1979) also pointed out that the richest and most elaborate *affordances* are other people—what he referred to as *mutual affordances* (p. 135). However, with this type of allowance, instead of simply yielding to the unilateral desires or abilities of a person, these animate objects naturally create relational interactions. Gibson (1979) contended:

> Behavior affords behavior, and the whole subject matter of psychology and of the social sciences can be thought of as an elaboration of this basic fact. Sexual behavior, nurturing behavior, fighting behavior, cooperative behavior, economic behavior, political behavior—all depend on the perceiving of what another person or other persons afford, or sometimes on the misperceiving of it. (p. 135)

This idea also compares to Dewey's (1916/2011) principle of reciprocal relationships as noted in his views of environmentalism. Within a classroom setting, a child's *affordances* include not only objects such as furniture and educational materials, but also other students as well.

Social Cognitive Theory

Bandura's (1977) Social Cognitive Theory is characterized by three distinctive features—(a) the prominent roles of human psychological functioning, (b) the capacity of humans to use symbols, and (c) a human's ability to self-regulate (vii). In the simplest of terms, people tend to learn much of what they need to know or do as a result of observing others. "Of the numerous predictive cues that influence behavior at any given moment, none is more common or effective than the actions of others" (Bandura, 1977, p. 87). Some of this observation may be intentional, as within an educational directive, but more likely, most of observational learning happens coincidentally through daily activity. Bandura (1977) asserted that:

> In actuality, virtually all learning phenomena resulting from direct experience occur on a vicarious basis by observing other people's behavior and its consequences for them. The capacity to learn by observation enables people to acquire large, integrated patterns of behavior without having to form them gradually by tedious trial and error. (p. 12)

In examining Bandura's (1977) Social Cognitive Theory more specifically, it becomes apparent that people's acceptance of new learning is dependent upon certain conditions that include an interpretation of others exhibiting behavior and the environment in which

the behavior occurs. Two specific aspects of this process contribute to this study's theoretical framework—reciprocal determinism and modeling.

Reciprocal determinism. Reciprocal determinism refers to the relationship between people and their environment. Bandura (1977) stated that:

> Social [cognitive] theory approaches the explanation of human behavior in terms of a continuous reciprocal interaction between cognitive, behavioral, and environmental determinants. Within the process of reciprocal determinism lies the opportunity for people to influence their destiny as well as the limits of self-direction. This conception of human functioning then neither casts people into the role of powerless objects controlled by environmental forces nor free agents who can become whatever they choose. Both people and their environments are reciprocal determinants of each other. (vii)

Similar to both Dewey (1916/2011) and Gibson (1979), Bandura (1977) recognized the relevance of environment on learning, and in particular, that a human's interaction with the environment is relational. "The major weakness of the traditional formulations is that [educators] treat behavioral dispositions and the environment as separate entities when in fact, each determines the operation of the other" (Bandura, 1977, p. 195). This view is particularly notable in classrooms where little consideration is given to the surroundings in which students learn and interact with others. Additionally, learning by way of environmental conditions is also cumulative. As people learn, they not only perform responses, but they also take notice of the effects they produce and develop hypotheses about which responses are appropriate in which settings (Bandura, 1977, p. 17). Bandura (1977) also noted that "humans do not simply respond to stimuli; they interpret them" (p.

59). This reinforces the idea that humans have a relationship with the environment, and that likely this relationship contributes greatly to an ability to learn, not just in isolation but also significantly over time. A comprehensive theory of behavior considers how patterns develop through the inclusion of such factors as self-generated and external sources of influence, as well as levels of psychological and physiological development (Bandura, 1977, p. 13). When applied to an educational setting such as a high school classroom, reciprocal determinism accentuates the importance of environment on student learning and the ongoing development of several affective processes.

Modeling. Another pivotal component of Social Cognitive Theory is modeling. According to Bandura (1977), modeling is the principal mode of transmitting new behavior to others (p. 54). This can happen purposefully, as with an instructor giving a lesson, or unintentionally, when people simply observe the behavior of others. These modeling influences produce learning mostly through their informative functioning (Bandura, 1977, p. 22), but either way, the observer is faced with a choice—to accept or reject the behavior. This would indicate that observers also include outcomes of behavior as part of their decision making. Initially, behavior may seem attractive to an observer, yet consequences of such may yield unfavorable results. This condition in reverse is also a consideration for an observer—seemingly unfavorable behavior may lead to enjoyable results, possibly encouraging the observer to adopt inappropriate actions. However, Bandura (1977) indicated that "those who have access to instruments of influence can exercise only partial control over the diffusion process. Not everything that is modeled becomes popular" (p. 54). People are also "more likely to adopt modeled behavior if it results in outcomes they value than if it has unrewarding or punishing effects" (Bandura,

1977, p. 28). In addition, modeling can encourage both affective and psychomotor responses in observers. In light of this, modeling can encourage positive emotional responses in observers that have psychological impediments, like fear or self-doubt. Bandura (1977) indicated that:

> Seeing others perform threatening activities without adverse consequences can create expectations in observers that they too will eventually succeed if they intensify and persist in their efforts. They persuade themselves that if others can do it, they should be able to achieve at least some improvements in performance. (p. 81)

This concept is often seen in classrooms when students observe behavior in another student and then wait for the response from the teacher before determining if they will adopt the behavior themselves. Bandura (1977) also indicated that "if people of widely differing characteristics can succeed, then observers have a reasonable basis for increasing their own sense of self-efficacy" (p. 82). This ideal contributes greatly to the group dynamics that are the ideal in classroom settings—if many students experience success with appropriate behavior, more are likely to join in. However, this same concept can work in the negative if too many students gain favorable results from inappropriate behavior before intervention occurs.

Additionally, while many adopted behaviors lead to affective changes in an observer, modeling that is deemed appropriate can also promote physical action for the onlooker. Observers convert symbolic representations by organizing their responses spatially and temporally in accordance with the model (Bandura, 1977, p. 27). Typically, a period of trial and error follows in order for the observer to master the behavior. Also,

because spatial considerations play a part, the physical dynamics of a classroom would contribute to a student's ability to adopt behavior. Bandura (1977) stated:

> Ideas are rarely transformed into correct actions without error on the first attempt. Accurate matches are usually achieved by corrective adjustments of preliminary efforts. Discrepancies between the symbolic representation and execution serve as cues for corrective action. A common problem in learning complex skills…is that performers cannot fully observe their responses, and must therefore rely upon vague kinesthetic cues or verbal reports of onlookers. It is difficult to guide actions that are only partially observable or to identify the corrections needed to achieve a close match between representation and performance. (p. 28)

In consequence, several factors become pivotal for successful adoption of psychomotor responses, which include the model, the observer, and other onlookers. Social, emotional, and physiological development also influence a child's ability to successfully implement new behaviors. Bandura (1977) contended:

> In studying the origin and determinants of modeling it is essential to distinguish between instantaneous and delayed reproduction. In the earliest years of development, children's modeling is largely confined to instantaneous imitation. As children develop skill in symbolizing experience and translating it to motor modalities, their capacity for delayed modeling of intricate patterns of behavior increases" (pp. 29-30).

The interpretation and adoption of modeled behaviors tends to parallel a child's cognitive and physical developmental abilities. This can become particularly significant in a high school classroom if students are required to perform or conduct physical tasks that may

require specific analytical or psychomotor skills. Theoretically, the consideration of modeling for both affective and physical responses is a substantial component of classroom research, particularly in terms of communal functioning.

Review of the Literature

High school educators are responsible to many stakeholders in the educational arena—students, parents, administrators, districts, states, and even the federal government. Primarily, the collective goal for everyone is achievement. Over the course of the last decade, the federal mandates of No Child Left Behind (NCLB) (2001) have put exceptional pressure on school systems and teachers to improve student achievement. It has become imperative for instructors to discover and implement new strategies that can meet both the needs of their students and the requirements of the government. One simple strategy worthy of consideration is the use of tables in core classrooms instead of traditional desks. While little research exists on the use of tables in high schools, current studies do indicate that achievement is linked to constructs such as attitude (Cakici, et al., 2011; Hemmings, et al., 2011; Jackman, et al., 2011), student self-efficacy (Caprara, et al., 2011; Skaalvik & Skaalvik, 2011), community (Booker, 2008; Davis, et al., 2010; Wighting, et al., 2009; Yasuda, 2009), and school environment (Berg, et al., 2012; Wannarka & Ruhl, 2008). The following review of literature presents a discussion of these constructs—attitude, self-efficacy, community-building, and environmental dynamics—that are related to achievement in order to establish the foundation upon which the role of tables may be examined. Each provides a different area of classroom context that can be investigated in relation to the use of tables.

Attitude

Students' attitudes toward school and learning can have a profound impact on their achievement. Sarwar, Bashir, and Alam noted:

> Attitude is a fairly stable emotional tendency to respond consistently to some specific object, situation, person, or category of people. It has three components: cognitive core, affective values, and behavioral action tendencies. The cognitive aspect of attitude consists of beliefs and ideas that a person has about the attitude object. The affective component includes the feelings of like and dislike toward any object, and the behavioral aspect consists of intentions to respond in a particular way toward the object. The making of perceptual and cognitive organization, with reference to formation of attitudes, depends upon the individual's social environment. (p. 55)

A school is certainly such a complex social environment, consequently contributing to the substantial variables surrounding student satisfaction toward learning. Accordingly, Silins (2000) found a significant and direct correlation between a student's attitude toward school and overall performance, even more so than socioeconomic status, retention, or school size. When examining students with a positive attitude toward school within the variables of gender, age, and ethnicity, Sullivan, Riccio, and Reynolds (2008) found little significance between the variables, indicating that other factors were more likely to have contributed to a positive student outlook. Some research indicates that age, perceived school performance, perceived socioeconomic status, school engagement, school strain, and teacher-student relations are all elements that can contribute to a student's attitude toward school (Haapasalo, Valimaa, & Kannas, 2010). Conversely,

Elmore and Huebner (2010) discovered factors that had a limited role in student attitude toward school, mainly relationships with parents and peers. This contradicts the findings of Huang (2010), who found that peer relations had a significant and strong, albeit negative, effect on student attitude, with the exception of "some weak positive effects from peer discussing of social issues and friend help" (pp. 303-304). Additionally, it has been found that more females than males exhibit a positive attitude toward school and learning (Elmore & Huebner, 2010; Hemmings et al., 2011; Schreiber & Chambers, 2003; Sullivan et al., 2008). Miron, Jones, and Kelaher-Young (2012) established that student attitudes were positively affected when programs for future college opportunities were put in place. While many studies reveal a distinct connection between a positive student attitude and academic achievement, it remains somewhat unclear what factors, or combination of factors, specifically influence a student's attitude toward school most significantly. Schwinger and Stiensmeier-Pelster (2010) found that some of these influences are related to the personal goals of students, but that conditions at school tended to have a more noteworthy impact on student attitude overall. Consequently, most current research reflects a wide range of factors from within the classroom that contribute to student attitudes toward learning and the school environment.

Subject matter plays a significant role in a student's outlook toward school. Student attitude and achievement has been correlated in specific core subjects, especially in the areas of math (Hemmings, Grootenboer, and Kay, 2011; Schreiber & Chambers, 2003; Shirvani, 2010), science (Cakici, Aricak, & Ilgaz, 2011; Keiler, 2011), language arts (Adkins-Colemen, 2010), and geography (Kormaz & Karakus, 2009). Often student attitudes toward specific subjects are influenced by a combination of the discipline and

the teaching strategies used for delivery of material. Keiler (2011) indicated positive attitudes in students toward science when three themes emerged in relation to instructor techniques—"(1) the use of fun activities, (2) a focus on understanding, and (3) relationships among students and teachers" (p. 366). Most significant of these was the focus on understanding, as students stated that they had a more positive attitude toward science when the teacher continuously checked for understanding (p. 369). The use of technology in the classroom can also enhance a student's approach to the learning environment. Kormaz and Karakus (2009) found that the use of a blended learning model, a combination of online and classroom instruction, contributed more to student critical disposition levels, noting a positive correlation between student attitudes toward geography and those levels. Similarly, Shirvani (2010) noted that the incorporation of computers in lessons significantly improved student attitudes toward mathematics. However, a negative correlation between computer-assisted instruction and student math achievement scores was found by Larwin (2010). This would indicate that multiple variables together in consideration of achievement can produce different results.

Teachers also tend to have considerable influence over students when it comes to fostering a positive attitude toward learning. Some stimuli are direct and intentional on the part of an instructor, but more often, they are byproducts of classroom strategies and activities used to engage learners. Sarwar et al. (2010) discovered that teachers have a key role in the development of student attitudes, citing a significant correlation between teacher approval and academic performance. Consequently, deliberate encouragement from an instructor to a student can promote positive attitudes that lead to achievement. It has also been shown that a student's attitude can be positively impacted through

interventions such as accommodations for individual learning style preferences (Lovelace, 2005). These intentional and tailored approaches on the part of an instructor can enhance pupil outlook toward the educational environment. Additionally, when teachers use specific instructional strategies, student attitudes can be positively affected. Meyer, McClure, Walkey, Weir, and McKenzie (2009) noted that the use of personalization strategies within lessons increased positive attitudes in students, indicating that personal connections to tasks lead to better student dispositions toward learning. This same study also revealed that assessments with direct and focused constructs were correlated with positive student attitudes toward test taking (Meyer, et al., 2009). Another classroom strategy that has been found to promote favorable outlooks in learners is the use of challenging activities. Adkins-Coleman (2010) learned that teachers who "created environments that taught students the value of participating in demanding instructional activities" (p. 51), fostered more students with positive reactions to learning. Similarly, Harlow, DeBacker, and Crowson (2011) discovered that student attitudes were more favorably affected by open-ended instructional activities than those utilizing closure techniques. Both of these findings indicate that students actually prefer more strenuous and critical types of engagement as noted through their favorable reactions. Cumulatively, the research in relation to student attitudes toward learning indicates that varying factors can influence a student's disposition toward school, and that a positive attitude can be linked to higher achievement.

Self-efficacy

Self-efficacy is a concept that stems from Social Cognitive Theory, which is reliant upon the combination of observational learning and social experience (Bandura, 1977). Bandura (1997) contended:

> To realize their aims, people try to exercise control over the events that affect their lives. They have a stronger incentive to act if they believe that control is possible—that their actions will be effective. Perceived self-efficacy, or a belief in one's personal capabilities, regulates human functioning. (p. 4)

This construct is clearly applicable to educational settings, particularly in high schools. Individuals with high perceived self-efficacy approach difficult tasks as challenges to be mastered, whereas people with low self-efficacy tend to avoid difficult tasks (Bandura, 1997). Both sets would have significant implications for performance in a classroom. The consideration of self-efficacy in relation to academic achievement is applicable to both students and teachers.

Students. Many factors can contribute to a child's development of self-efficacy. Bandura (1986) found the following:

> Four major sources of information are influential in shaping and modifying self-efficacy beliefs: (a) past performance accomplishments, (b) exposure to and identification with efficacious models (vicarious learning), (c) access to verbal persuasion and support from others, and (d) experience of emotional or physiological arousal in the context of task performance. Of the four sources, past performance accomplishments are generally assumed to be most influential

> in promoting self-efficacy given that they are based on authentic mastery experiences. (as cited in Lopez & Lent, 1992, p. 3)

Additionally, adolescents who felt valued and respected by their classmates reported increased self-efficacy and motivation (Nelson & DeBacker, 2008). Bandura, Barbaranelli, Caprara, and Pastorelli (1996) also identified parenting efficacy as an influence on student self-efficacy in relation to academic achievement. This would indicate that confidence can be taught, or at least modeled. In this way, teachers can also contribute greatly to a child's sense of capability. Bagakas (2010) found that a teacher's ability and competence in teaching played a key role in promoting students' self-efficacy, as well as narrowing the gender gap in student self-confidence. Alivernini and Lucidi (2011) showed "that the level of self-determined motivation in students, which was directly related to the perception of teachers' autonomy support, was the best predictor of the intention to drop out of school" (p. 241). Conversely, a student's desire to remain in school is also critically impacted by teacher influence, particularly as it relates to promoting independence and self-determination of students. Additionally, Alivernini and Lucidi (2011) found:

> Students who perceived their social context as supportive of their autonomy, particularly regarding the role of teachers, also had higher perceived competence and self-regulation, measured in terms of academic self-efficacy. These perceptions of effectiveness, in turn, were positively correlated with school performance and the students' level of self-determination. (pp. 250)

Any number of factors can contribute to a child's sense of self-efficacy. Clearly, this is an important attribute for student success.

Accordingly, students' belief in their own abilities and power to self-regulate has been found to influence scholastic achievement (Bandura et al., 1996). Examined in conjunction with personality traits, Caprara, Vecchione, Alessandri, Gerbino, and Barbaranelli (2011) observed that academic self-efficacy contributed to overall academic achievement in high school students. Walker and Greene (2009) also noted that self-efficacy was a stronger predictor of goal mastery than both instrumentality and sense of belonging. Clearly, a student's own sense of ability is a strong determinant of scholastic success. Not surprising, Martin, Colmar, Davey, and Marsh (2006) identify student self-efficacy as one of the five motivational predictors of academic buoyancy, along with coordination, commitment, composure, and control. These predictors are noted in sustaining students during times of the "academic adversities they face and the ways they deal with them" (pp. 473-474).

While a student's confidence in ability has been shown to contribute to academic achievement overall, this construct becomes even more significant when applied to school subjects of preference. Student self-efficacy has been shown to influence achievement in specific core subject areas in high school, specifically in language arts (Hawthorne, 2008), math (Akinsola & Awofala, 2009; Larwin, 2010; Kitsantas, Ware, & Cheema, 2010; Skaalvik & Skaalvik, 2011; Topcu, 2011), and science (Bryan, Glynn, & Kittleson, 2011; Lerdpornkulrat, Koul & Sujivorakul, 2012). Researched in correlation with locus of control and interest in school, Tella, Tella, and Adeniyi (2009) learned that self-efficacy contributed significantly to overall achievement in English, math, and science. This suggests that student self-efficacy is likely a personal trait that transcends many aspects of a learner's school experience. Specifically, Hawthorne (2008)

discovered that reluctant students are more aware that believing in themselves as writers plays an important role in their motivation and engagement with writing tasks in English class. Skaalvik and Skaalvik (2011) determined that self-efficacy was linked to achievement in math, even more strongly than the variable of prior achievement. Comparatively, Kitsantas et al. (2010) used several methods of analysis and controlled for demographic characteristics of students and schools and found that self-efficacy was the most significant determinant of math achievement of the variables tested. Interestingly, the incorporation of certain instructional strategies can also increase a student's sense of ability. Topcu (2011) analyzed the strategy of spread-sheet-based instruction which lead to significantly higher self-efficacy in algebra students. Similarly, Akinsola and Awofala (2009) examined self-efficacy in conjunction with the strategy of personalization which yielded even greater gains for students, particularly in word problem achievement. With regard to science, Bryan et al. (2011) obtained student responses about their intrinsic motivation, self-efficacy, and self-determination, finding that the three components were related to each other and achievement, but that self-efficacy was the variable most significantly related to achievement. However, when stereotypes like "males are better in physics" were introduced, Lerdpornkulrat et al. (2012) documented a decreased sense of self-efficacy in females, but found no significant change in male sense of self-efficacy if a similar stereotype, "females are better in biology," was given. The complexity of variables surrounding a student's sense of their own ability is limitless, yet most research substantiates that self-efficacy remains a strong determinant of academic achievement.

Teachers. Teacher self-efficacy is oftentimes an integral part of student achievement. A teacher's past achievements can foster a sense of confidence that leads to the creation of opportunities that afford success, not only for the teacher but also for students (Bagakas, 2011; Caprara, Barbaranelli, Steca & Malone, 2006). When teachers are confident and expect their students to do well, they interact with them in ways that lead to their expectations being fulfilled (Rubie-Davies, Peterson, Irving, Widdowson, & Dixon, 2010). A teacher's self-efficacy creates a supportive classroom environment and increases student motivation (Hardre & Sullivan, 2009). This type of self-concept in teachers can also influence the self-efficacy of students and even parents, creating an interdependent network that leads to achievement (Corkett, Hatt, & Benevides, 2011; Hardre & Sullivan, 2009). Research also indicates that teacher self-efficacy has been linked to achievement in specific school subjects (Bagakas, 2011; Bolshakova, Johnson, & Czerniak, 2011; Corkett et al., 2011). Teacher and student self-efficacy was found to be correlated to achievement in reading and writing, although the researchers mark a notable distinction between actual student efficacy and teacher perceived efficacy in students (Corkett et al., 2011). Related to math, Bagakas (2011) discovered:

> Teachers' interest and enjoyment of mathematics were also found to significantly enhance the students' self-confidence and competence in mathematics as well as their interest in, effort in, and perception of importance of mathematics. Identifying teachers with such characteristics may, therefore, be key to improving students' self-efficacy and hence their performance in mathematics. (p. 837)

Bolshakova et al. (2011) found teacher self-efficacy strengthened student science self-efficacy and increased science achievement. Additionally, a higher level of classroom

supervision was determined for special education resource-room teachers that exhibited self-efficacy (Coladarci & Breton, 1997). Fancera and Bliss (2011) reported a correlation between overall teacher self-efficacy and student achievement; however, contrary to most other findings, they noted that socioeconomic status was a stronger predictor of achievement than either teacher self-efficacy or school leadership. While teacher self-efficacy is generally a positive indicator toward student self-efficacy and achievement, the lack of teacher self-efficacy due to burnout has been linked to depersonalization in the classroom and significantly lower levels of achievement in students (Evers, Brouwers & Tomic, 2002).

Community-building

Communities can be identified geographically or functionally (Yasuda, 2009). Any formalized grouping of people lends itself to the prospect of establishing a community. Cities, districts, and neighborhoods constitute communities. These types of cooperative entities are also apparent in groups of people with similar interests or regular functions. Sarason (1974) identified this construct as a Psychological Sense of Community (PSOC), which suggests that people in a community have an "interdependence with others, a willingness to maintain this interdependence by giving to or doing for others what one expects from them, and the feeling that one is part of a larger dependable and stable structure" (p. 157). This type of community leads to membership, a sense of communal spirit, emotional safety, a sense of belonging, trust, trade, and artifacts (McMillan, 1996). Accordingly, a school is a part of a community, and therefore its success relies significantly upon its healthy and ongoing relationship

with its surrounding members. Lester (2011) found this to be particularly true in rural areas:

> Principals and teachers who understand the importance of relationship building—especially its personal and community-wide facets—who take the initiative in establishing and nurturing relationships and improving them through reflection over time, are more successful at motivating, inspiring, and aligning country people to facilitate change. (p. 79)

A school can also be considered a type of community on its own. Educational leaders would be wise to capitalize on the benefits of building and nurturing schools to operate as thriving communities. Booker (2007) discovered that students felt a greater sense of belonging at school when they experienced fewer differences between themselves and others; however, the same constructs that lead to a sense of belonging did not have a significant correlation to achievement. Nevertheless, Lee, Ozgun-Koca, and Cristol (2011) found that building a sense of community within a school lead to higher graduation rates. Similarly, Shouse (1999) established that the combination of academic press, described as "the degree to which school organizations are driven by achievement oriented values, goals, and norms" (p. 61), and sense of community were linked to achievement, particularly in schools with low socioeconomic communities. Wighting et al. (2009) also found a positive correlation between high school students' sense of community and academic achievement. According to Lee et al. (2011), "Creating a sense of community, rather than simply transforming the school structure, seems to be the key to improving high school education" (p. 2).

Theoretically, these same considerations can be extended to the smaller classroom setting, where teachers become community leaders and students become integral members of a group with common interests. Yasuda (2009) applied PSOC to the classroom, finding that students experienced a greater sense of community in smaller spaces or when academic engagement was present. This aligns with McMillan's (1996) facets of emotional security and sense of belonging. It has also been shown that in "their favorite classes, more students attributed positive experiences and a sense of connection to their faculty instructor" (Booker, 2008, p. 15). Similarly, peers also have a significant impact on a student's sense of community and level of engagement (Beck, 2009; Booker, 2008). Additionally, Davis, Chang, Andrzejewski, and Poirier (2010) found that the use of intentionally established Smaller Learning Communities (SLC) within a school promoted student confidence, engagement, and a value of the educational process.

Community-building within a classroom can yield several benefits for students. Powell and Lines (2010) contended:

> Belonging to a personally meaningful community of learners is a powerful predictor of a student's retention and academic success. Being part of a community that is intentionally built on recognizing, valuing, and learning from the diversity within that community can further deepen students' understanding of self, others, and the global community in which they will live and work. (p. 19)

However, building a community within a classroom is not necessarily an easy task. DiCamillo and Pace (2010) found that using a transformative, performance-based approach in a history class increased students' sense of community, but it also conversely decreased achievement for some students. Similarly, Kumnuanta (2011) discovered that

using self-paced learning and peer tutoring in a computer lab course fostered a sense of community, but there were no significant gains in achievement between the experimental and control groups. Skudrzyk et al. (2009) designed a series of creative art exercises that included art, poetry, and music to promote belonging, connectedness, and wellness among adolescents, some with disabilities. These results also indicated that students exhibited higher levels of affective response to the alternative activities versus traditional strategies, but no correlations to achievement were noted. It is clear that "groups have long been used to foster a sense of belonging and connectedness, a goal that is particularly pertinent for adolescents as they search to find meaning in their lives through affiliation with others" (Skudrzyk et al, 2009, p. 258). For some students, searching for a sense of belonging is a way of life if they live within a distinctive subculture apart from the rest of their school population. In an attempt to bridge these gaps in the classroom and beyond, Haney, Thomas, and Vaughn (2011) examined community building as a precursor to restorative practices for school offender dropouts, revealing that "restorative school practices stress the importance of relationships over and above absolutist (retributive-laden) rules" (p. 76). Here the importance of creating a sense of community for students is about much more than academic achievement. For these types of students, a sense of belonging can help to establish a path by which students are reintegrated into society. Haney et al. (2011) indicated:

> Many schools have repaired their school communities after student infractions by implementing restorative circle group encounters where owning responsibility takes precedence over placing blame and providing punishment. To achieve this goal, a culture of respect, inclusion, and accountability are paramount. But if a

> perpetrator never feels membership in the school community, s/he cannot experience the necessary restorative practice of 'reintegration.' (p. 76)

Seating arrangement. Traditional classrooms tend to include the use of rows of desks for student seating. Sztejnberg and Finch (2006) found that the traditional row and column classroom seating arrangement is dominant, particularly when teachers had a strong teacher-centered approach to instruction. This conventional teaching style lends itself to the use of direct instruction which has been historically the custom in high school classrooms. Sztejnbert and Finch (2006) noted:

> In the teacher-centered situation, the classroom space is usually arranged into rows and columns of tables or chairs facing a blackboard with the teacher's desk in front of the classroom, while in the student-centered approach classroom arrangement permits students to work together. (p. 499)

Even if educators use a student-centered approach and may actually prefer collaborative seating layouts for students, oftentimes administrative demands to meet legislative mandates prohibit extended use of these methods. Standardized test taking is certainly easier to administer to children sitting individually in rows of desks. Webb and Vulliamy (2007) found that recent governmental changes in education include a dramatic increase in whole-class instruction, the use of learning objectives shared with pupils, and changes in pupil seating arrangements. Consequently, teachers may feel forced to rely on room arrangements that are conducive to instructional methods that promote this kind of standardization. Webb and Vulliamy (2007) stated:

> After initially being forced to change their practice, a large majority of our sample

> of teachers who were trained before 1990 have come to perceive the limitations of their prior commitment to pupils seated in groups but working individually at their own pace and to broad-based topics developed around activities; instead, they have argued for the benefits of a more structured and focused approach to their teaching where lessons are more carefully planned and lesson objectives are shared and reviewed with pupils. (p. 577)

This indicates that many instructors have shifted their teaching methods to address governmental demands by incorporating pedagogy that focuses more on uniformity. Additionally, Webb and Vulliamy (2007) contended:

> If the pressures of testing and [score comparisons] are maintained, together with the pressures of other external accountability audit mechanisms, then these seem likely to constrain severely the development of innovation and experimentation in teaching and continue to have deleterious consequences for pupil learning. (p. 578)

While conformity among teachers is understandable and for the most part favorable, it is unclear why instructors simply do not alter seating arrangements more often to meet the needs of students during certain methodological activities. Ironically, Sztejnberg and Finch (2006) determined that "overall classroom seating arrangement in secondary schools [remains] established. Teachers do not change these arrangements during the school year" (p. 499). However, Baines, Blatchford, and Kutnick (2003) discovered that secondary school students were more likely to engage in peer interaction in the classroom than primary age children, albeit more often through grouping practices, not necessarily by way of permanent seating arrangements.

There are varying perspectives about what types of seating arrangements are optimal for student learning and classroom management. Most seating arrangements in classrooms are designed to address behavior, not achievement (Wannarka & Ruhl, 2008). Baines et al. (2003) found:

> Teachers…maintain control of pupils' behavior and attention by using more formal row and paired seating, where pupils face the front of the class, and by directing teaching and support to very large groupings, usually whole classes. These practices seem to be aimed at promoting on-task attention, teacher-pupil interaction and individual work and may be considered good practice where the only aim is to encourage these working interactions. Further practices identified…[were] geared to making a didactic approach of teaching easier and efficient (p. 29)

However, Rosenfield, Lambert, and Black (1985) found rows of desks to be the least favorable condition to on-task behavior, instead discovering that clusters worked better, and circles better still. These fragmented views indicate the need to assess the particular needs of students and the individual talents of teachers. Much of this decision making comes down to classroom management preferences and abilities. "Teachers who wish to facilitate pupil interaction during discussion sessions would be wise to consider arranging desks in circles" (Rosenfield et al., 1985, p. 106). Similarly, Marx, Fuhrer, and Hartig (2000) observed that students ask more questions when sitting in a circle than when sitting in rows, and more interaction occurs between students during classroom activities when face to face contact exists. In order to promote these critical thinking skills that incorporate discussion and inquiry, O'Hare (1998) suggested that classrooms should

include certain furniture or processes that accommodate group interaction. These include physical space for comfort, work space for materials, and seating that is conducive to clusters of students. Ultimately, teachers are left to decide where their priorities lie—in the enhancement of critical student engagement or in orderly standard practices.

Most teachers do make informed and purposeful decisions concerning room layout and student seating arrangements. O'Hare (1998) indicated that "teachers are increasingly challenged by traditional seating" (p. 706), but as already noted, most teachers continue to rely on this arrangement either to promote behavior management or to conform to current standardized practices. To this end, what is left to the control of a teacher is "who sits where" within the rows of seats. Gest and Rodkin (2011) found that teachers assigned seats partly based on separating students who might pose behavior issues, but their choices were also dependent upon classroom level patterns of liking, disliking, and friendship. When students that might cause behavior problems were separated, these classrooms were noted as having "a stronger predominance of liking over disliking, and reported denser friendship networks" (Gest & Rodkin, 2011, p. 294). In addition to negative behavior avoidance, teachers also assigned student seats in an attempt to foster friendships between specific students, which had an unexpectedly negative effect on classroom dynamics (Gest & Rodkin, 2011).

In some classrooms, students are permitted to select their own seats. This seemingly simple task can actually have profound implications for a learner. Fernandes and Huang (2012) recognized that seating arrangements had an impact on students and their participation levels in the classroom. Additionally, some seating arrangements have even been found to invoke feelings of unease in students (Burgess & Kaya, 2007). It is

suggested that students be aware of the many challenges seating arrangements pose within a classroom, and that whenever possible, they should choose a seat that is comfortable and provides a beneficial position to enhance their learning experience (Fernandes & Huang, 2012). While this is good advice, it is not likely that students make seat selection choices based on their learning potential. It is more probable, especially for high school students, that these choices reflect social considerations.

Cooperative learning. May and Doob (1937) established that when working in cooperation, people were more successful in reaching a common goal. Many variations of this ideal have been applied in government, business, and education. Cooperative learning is marked by the use of structure that creates a positive interdependence between its participants (Kagan, 1994; Slavin, 1990). "The structural approach to cooperative learning is based on the creation, analysis, and systematic application of structures, or content-free ways of organizing social interaction" (Kagan, 1989, p. 12). It is not surprising that cooperative learning is commonly used in classrooms where common goals are typically the norm.

When applied to an educational setting, Kagan (1989) asserted that "structures may be used repeatedly with almost any subject matter, at a wide range of grade levels, and at various points in a lesson plan" (p. 12). Cooperative learning can be used within a classroom to elicit an array of outcomes. It has been found to significantly increase student achievement, particularly within the subjects of math (Nichols, 1996) and science (Apedoe, Ellefson, & Schunn, 2012; Ibraheem, 2011; Lazarowitz, Hertz, Baird, Bowlden, & Wollman, 1988; Parveen & Batool, 2012; Watson, 1991) where critical thinking and inquiry are a priority. Specifically, Parveen and Batool (2012) found that a cooperative

learning method was superior to traditional methods in promoting general science achievement in ninth grade students. Ibraheem (2011) determined that the use of student teams achievement divisions (STAD), a type of cooperative learning strategy, had a significant effect on achievement and attitude in high school chemistry students; however, it was also found that this technique worked better without a competitive component. Additionally, when controlling for cooperative group size, Apedoe et al. (2012) found that smaller groups positively influenced student learning and a student's ability to transfer knowledge into other contexts. When applied to a high school economics class, Beavers (2011) confirmed that STAD promoted achievement, but also positive social, self-esteem, peer support, and motivational team aspects.

Ediger (2009) included cooperative learning as one of the seven criteria necessary for an effective classroom, suggesting that it improves engagement, politeness, and consideration for others. Consequently, it is evident that cooperative learning methods can enhance a variety of relational skills in students in addition to considerations of achievement. Even when they do not experience increased levels of achievement through cooperative learning tasks, students enjoy the social and motivational aspects of the method (Beavers, 2011). In targeting secondary social studies classrooms, Nagel (2008) recommended:

> Pre-service social studies majors at the secondary level should practice cooperative learning strategies, such as 'rallytable,' 'round table,' and 'talking chips' prior to teaching. By modeling cooperative learning strategies, pre-service teachers are exposed to the five essential elements of cooperative learning;

> positive interdependence; face-to-face interaction; individual and group accountability; interpersonal skills; and group processing. (p. 363)

All of these constructs can potentially affect students in a positive way. For example, cooperative learning has been found to decrease anxiety in students in math (Lavasani & Khandan, 2011) and science (Oludipe & Awokoy, 2010). Math teachers can form cooperative groups to reduce mathematic anxiety through discussion, dialogue, and interaction with students, which increases interest, promotes help seeking behaviors, and decreases avoidance behaviors (Lavasani & Khandan, 2001). Ideally, cooperative learning also creates a learning atmosphere where students can depend upon one another supportively. Within chemistry courses, Oludipe and Awokoy (2010) observed:

> The positive effect of cooperative learning method on students' anxiety for learning chemistry…made it possible for students to see that their success is dependent on their contributions, inclusion, and success of the other students in the group. In view of this, students were able to exchange ideas on given tasks among themselves and this made it possible for students with low intellectual ability and slow learners to gain from members of their groups. Hence, they became more confident and felt secured participating actively in chemistry lessons. (p. 35)

This indicates that in addition to its contributions to achievement and the reduction of anxiety in students, cooperative learning can be used as a way to comprehensively engage students of all levels. O'Brien and Wood (2011) found that the use of video modeling promoted positive group social skills for secondary students with learning disabilities. Additionally, Pell, Galton, Steward, Page, and Hargreaves (2007) found that cooperative

learning in the classroom was empirically linked to increased motivation in at-risk students. However, Reilly and Mitchell (2010) determined that when left to select their own groups for cooperative tasks, low-track students experienced greater feelings of alienation, lower self-esteem, and a reduced willingness to cooperate with their peers. In light of this, teachers should be keen to carefully and thoughtfully structure cooperative groups, especially in consideration of struggling learners.

There are additional drawbacks to using cooperative learning in a classroom. Beavers (2011) found that some students experienced frustration during cooperative activities when the instructor was working with another student or group. This might indicate that some students have come to rely on traditional approaches and prefer a teacher-centered delivery of instruction. Another downside to cooperative methodology is its inherent lack of structure. This is particularly troublesome for teachers who already struggle with classroom management issues. And because students do much of the work independently, it can be difficult to supervise all groups at once. Beavers (2011) discovered:

> While the students often remained on task during group work, there was a great variability within the groupings as to the type and quality of talk. Some groups were off task more than others and a few students appeared to struggle more with understanding the required tasks. (p. 12)

In light of this, many teachers are deterred from using cooperative learning. Koutselini (2008) found that "teachers have negative attitudes towards cooperative learning because they do not know how to ensure collaboration, coherence, and interaction among members of the group" (p. 34). This reinforces Nagel's (2008) view that cooperative

learning techniques should be an integral part of pre-service teacher training. It may well be that additional preparation is necessary for more teachers to feel comfortable in using cooperative learning in their classrooms. Accordingly, Koutselini (2008) discovered:

> Teacher experiences during their schooling, and to a great degree during their university studies education, do not give them the opportunity to actually apply cooperative learning in a way that might change their understanding and attitude towards such learning. (p. 40)

In addition to this lack of experience, teachers also avoid the use of cooperative learning because it is time consuming, requiring a higher level of expertise in classroom coordination than more traditional methods (Koutselini, 2008).

Environmental Dynamics

There is little current research concerning the environmental dynamics of high schools, and existing studies are significantly contradictory to one another. This may be due to the fact that the learning environment of a school is such a multi-faceted construct. Facility design, educational practice, school culture, and student learning are interrelated components of a school's overall learning environment (Gislason, 2010). Students can be affected or influenced by the school as a whole or by smaller factions of a facility. Owens and Valesky (2007) identified four overlapping aspects that shape a school's climate: (a) organization, which includes teaching, scheduling, and curriculum, (b) staff culture, which includes assumptions, values, and patterns of thought and behavior, (c) ecology, which includes building design, technology, and other material elements, and (d) student milieu, which includes learning, motivation, and social climate (as cited in Gislason, 2010, p. 129). Any combination of these factors can contribute to the

complexity of effects on students that attend school. In consideration to relevance of this study, research that is specific to physical environmental dynamics of school settings is presented.

Various affective responses from students are associated with certain elements of the learning environment. Unfortunately, the emotional balance of students in their daily surroundings is often sacrificed for gains in achievement and scores (Booker, 2008; Ediger, 2009), and only limited research has linked school design with the human interactions that regulate learning environments (Gislason, 2010). However, a few studies have been conducted to elicit student perceptions of the school environment. In terms of school design, Gislason (2009) found that students felt more social connection to their peers, leading to feelings of social acceptance, when attending a school with an open plan design because opportunities for interaction were more prevalent. This indicates that space is a likely factor that influences a student's affective response. Zullig, Huebner, and Patton (2011) suggested that students' perceptions of school climate are essential to understanding individual differences in school satisfaction. Students identified five domains that mattered the most to them in relation to school satisfaction: (a) academic support, (b) positive student-teacher relationships, (c) school connectedness, (d) order and discipline, and (e) academic satisfaction, indicating that a school's physical and social environment were actually considered less important to them (Zullig et al., 2001). Werblow and Duesbery (2009) discovered that the size of a high school had an effect on math achievement, noting that 5% of gains could be contributed to attendance at either a small or large school. Additionally, dropout rates were positively correlated with larger schools, where an average dropout rate of 12% was noted (Werblow & Duesbery, 2009).

In consideration of high school classrooms specifically, little research exists that explores the effects of physical dynamics on students. Englehart (2011) did discover that class size, in terms of the number of students in a room, contributed to the dynamics of a high school classroom, noting negative effects of larger classes on distribution of participation, cohesiveness, and student comfort. Additionally, Pierce (2012) found that power constructs within a school were the most significant determinants of securing spaces for English as a Second Language (ESL) classrooms, resulting in the use of a range of small spaces that tended to negatively impact the culture created for English Language Learners (ELL). In consequence, it was discovered that teachers had little control over classroom size and design which forced them to manipulate spaces by storing instructional materials, limiting movement activities, and frequently rearranging seating to ensure student comfort (Pierce, 2012). Although somewhat disheartening within this specific context, these findings have implications for use of space within regular high school classrooms as well.

Some studies have been conducted to explore these environmental constructs in lower grade classrooms and in college settings. Within the confines of individual primary classrooms, Berg, Segers, and Cillessen (2012) found that increased space between students reduced both their negative perceptions of one another and victimization of peers. This finding is comparable to one of a college classroom, where seating layouts that provided ample personal space tended to put students at ease, especially girls (Burgess & Kaya, 2007). Space can be a troubling concern for college educators, especially for required general lecture type courses. Aborisade (2009) experienced large numbers of students crammed into small classrooms and lecture theaters, demonstrating a

definitive need for better learning spaces. The result was the incorporation of a blended learning environment to include classroom wikis that allowed students to work online in collaborative formats. Not only did it free up space on campus, but students also developed increased levels of autonomy and digital literacy (Aborisade, 2009). Also looking to reclaim college classroom space, Hargis and Schroeder (2010) experimented with a learning rich classroom that featured mobile furniture and instructional technology and noted:

> Fellows commented that the movable chairs and roominess of the classroom allowed them to 'easily change class set-up…multiple times during class.' Such set-ups included partnerships, small groups, and town hall meetings. By arranging the room in such ways, professors indicated that they could move more easily around the room to, 'hear what groups are discussing,' offer immediate feedback, and simply improve their interactions with students during such periods. (p. 7)

The limited amount of research in this area can likely be attributed to the lasting conventional educational practices alluded to earlier. Most learning institutions tend to change slowly. Sztejnberg and Finch (2006) indicated that school classrooms all tend to have similar physical characteristics, signifying a need for improvement in future learning spaces. Rickes (2009), who identified today's college students as "Millennials," whose demands for modern learning space will force higher education to make structural and technological changes on campuses, noted:

> Because today's students socialize, study, and collaborate in groups, the learning

> environment is no longer place-bound. This translates to a need for multipurpose spaces for group activities, including small group/seminar rooms and blended social/academic spaces. As veteran multitaskers, students do not view spaces as single purpose in nature. (p. 12)

Some of these changes are becoming more apparent, but overall these structural modifications are time consuming and expensive to implement. Additional research is needed to determine what other physical environmental factors within schools and school classrooms may have significant effects on students.

Summary

The combination of the enactment of NCLB (2001) and growing global competition has put ample pressure on educators to document achievement gains in their students. Unfortunately, in a struggling economy, many school districts cannot afford expensive interventions that may influence student success. Districts and schools are no doubt looking for cost effective ways to produce results. One condition that continues to be overlooked is the physical environment in which students learn. Students' physical and emotional comfort is often not a consideration when planning, designing, and furnishing schools and classrooms. High schools have especially remained the same structurally, and little research has been conducted to study the effects of using tables instead of traditional desks in these classrooms. It should be noted, however, that more and more colleges and universities are looking into atypical classroom designs, particularly in regard to the use of tables and innovative seating layouts.

Several theories contribute to an understanding of the constructs surrounding the use of tables in a high school classroom. Dewey's (1916) ideas concerning

experimentalism and environmentalism provide insight into how children learn and interact with their surroundings in the process. Gibson's (1979) Ecological Approach, which includes his concept of *affordances,* also helps to explain the conditions in which students interact with the environment. Social Cognitive Theory (Bandura, 1977) lends thought to the way students interact with each other, which is imperative in examining the use of communal seating in a classroom. These theories, examined in conjunction with the constructs attitude, student and teacher self-efficacy, community-building, and environmental dynamics, create an appropriate conceptual framework through which to explore the use of tables in high school classrooms.

CHAPER THREE: METHODOLOGY

The condition of public education in the United States is at a definitive turning point. Federal pressure on schools to document student achievement remains at the forefront of educators' minds. Unfortunately, additional stress for instructors comes from the difficulties in keeping up with global competition and technological advances. While teachers wish to contribute to these needs of society, they are limited in scope by lack of funding, regulations, and an archaic educational infrastructure. This study sought to explore a simple, yet promising classroom adjustment that could positively impact students, teachers, and administrators. The following research examined the human conditions surrounding the use of tables and chairs instead of traditional desks in language arts, math, and social studies classrooms. This chapter presents the design, guiding research questions, participants, setting, procedures, researcher's role, data collection procedures, and data analysis for the study. Trustworthiness and ethical considerations are also addressed.

Design

This qualitative research was conducted as an exploratory (Yin, 2009), collective (Stake, 1995, 2006) within-site case study to explore the use of tables and chairs instead of desks in high school classrooms. This design was appropriate because several bounded systems were examined using multiple sources of information (Creswell, 2007, p. 73). To establish triangulation, the cases were three core subject classrooms—language arts, math, and social studies. A science classroom was not used in the study, as these classes typically use lab tables to conduct experiments. Part of the gap that was addressed by this

research surrounds the possible transference of findings relative to science classroom strategies to the other core subjects through the use of tables.

The purpose of the design relied upon a combination of elements from both exploratory (Yin, 2009) and collective (Stake, 1995, 2006) case study research. Because the study was primarily an investigation of what role tables have in relation to several classroom constructs, the exploratory format was useful because it is open-ended, reinforcing credible and pragmatic collection of many types of data. This also allowed the researcher to avoid over-reliance on preconceived propositions. Additionally, because the design was collective in using three cases, it allowed for more variation of data and a stronger likelihood of transferability. The selection of the student sample was an important aspect of the collective design because a wide range of students participated. Purposeful maximal sampling (Creswell, 2007, p. 75) was initially used to identify potential student participants. Stratified purposeful sampling (Patton, 1990) was used to determine the ultimate student sample. Criterion sampling (Patton, 1990) was then used for teacher and administrator participants. To reinforce triangulation, data was collected using a variety of methods which included observations, interviews, documentation, and artifacts. All procedures were replicated for each case (Yin, 2009) to ensure dependability. Yin's (2009) analysis techniques, which include pattern matching, explanation building, time-series analysis, logic models, and cross-case synthesis were all utilized to interpret data. Careful consideration was also given to establish trustworthiness and ethical applications for the study.

Research Questions

The research questions that guided this study are as follows:

1. *What are the experiences of high school students and teachers when tables and chairs are used in a classroom instead of traditional desks?*

   The use of tables instead of desks in high school classrooms is rare, and little research has been conducted to analyze what effects their use may have on students and teachers. This question led to a better understanding of these effects on students and teachers and how they impact the educational environment and student learning.

2. *How does the use of tables and chairs instead of traditional desks affect student and teacher attitudes toward the educational process?*

   Because student and teacher attitudes to learning have been found to impact achievement (Cakici, et al., 2011; Hemmings, et al., 2011; Jackman, et al., 2011), it was important to explore what role tables have in conjunction with this construct.

3. *How does the use of tables and chairs instead of traditional desks affect student and teacher performance self-efficacy?*

   Because student and teacher performance self-efficacy have been found to impact achievement (Caprara, et al., 2011; Skaalvik & Skaalvik, 2011), it was important to explore what role tables have in conjunction with this construct.

4. *What are the possible community-building implications of using tables and chairs instead of traditional desks?*

   Because community-building has been found to impact achievement (Booker, 2008; Davis, et al., 2010; Yasuda, 2009), it was important to explore what role tables have in conjunction with this construct.

5. *What physical environmental dynamics are present in a classroom that utilizes tables and chairs instead of traditional desks?*

   Because physical learning environment has been found to impact achievement (Berg, et al., 2012; Wannarka & Ruhl, 2008), it was important to explore what role tables have in conjunction with this construct.

Participants

Three cases were used in the study—a language arts classroom, a math classroom, and a social studies classroom. Criterion sampling (Patton, 1990) was used to secure three teachers and three administrators as participants. Criteria for teacher and administrator samples was a minimum of two years of experience working in or with classrooms that utilize tables exclusively instead of desks. The specific classes that were used for data collection were determined by the student sample. The overall student sample consisted of 59 high school students identified through purposeful maximal sampling (Creswell, 2007) to allow the cases to show different perspectives. Students were identified using school scheduling records. All the students were enrolled in courses that belonged to one of the three cases. Stratified purposeful sampling (Patton, 1990) was used to hone the sample by subject, gender, all four class ranks (freshman, sophomore, junior, senior), and several course levels (remedial, college preparatory, honors) for each case (see Table 1). School scheduling records were also used to stratify the student sample. Once specific classes were identified to meet the criterion sample (Patton, 1990), parental consent was secured for all students enrolled, as well as student assent to participate. Twenty-two students were identified within the cases—eight in language arts, six in math, and eight in social studies—to participate in interviews, but all

Table 1.

Demographic Breakdown of Student Participants

Participant	Age	Gender	Ethnicity	Grade	Course
LA	14	Female	Caucasian	9	Honors
LA	15	Male	Caucasian	9	Honors
LA	16	Male	Caucasian	10	Honors
LA	15	Female	Asian	9	Honors
LA	16	Female	African-American	10	Honors
LA	15	Female	Caucasian	9	Honors
LA	14	Male	Asian	9	Honors
LA	15	Male	African-American	10	Honors
MATH	17	Male	African-American	11	Remedial
MATH	16	Female	Caucasian	11	Remedial
MATH	17	Female	Caucasian	11	Remedial
MATH	18	Female	Caucasian	12	Remedial
MATH	18	Male	African-American	11	Remedial
MATH	18	Male	African-American	12	Remedial
SS	18	Male	Latino	11	College Prep
SS	16	Female	Caucasian	10	College Prep
SS	17	Male	Caucasian	11	College Prep
SS	17	Male	Caucasian	11	College Prep
SS	17	Female	Latino	11	College Prep
SS	18	Female	African-American	12	College Prep
SS	17	Male	African-American	11	College Prep
SS	16	Female	Caucasian	10	College Prep

Note: Language arts students are represented by LA, and social studies students are represented by SS.

of the students participated in one or more of the other types of data collection. All potential activities of participation were addressed in the letters of consent and assent for students (see Appendices A & B), teachers (Appendix C), and administrators (Appendix D).

Site

Jefferson High School (pseudonym) is a traditional suburban public secondary school located in a coastal community in the southeastern United States. It has a population of 850 students, 50 faculty members, and three administrators. The school serves as a college preparatory site for its district, allowing open entry for any students who are residents of its county. The school is the only high school in its district with classrooms that utilize tables and chairs instead of desks in core subject areas other than science. This exceptionality was noted initially through communications with individual schools within the district, and eventually confirmed through district personnel. The site is unique in particular because it houses at least one table-furbished classroom in all three of the other core subjects opposite science—language arts, math, and social studies. The school fosters no formal pedagogy concerning the use of desks or tables; teachers are permitted to choose based on preference and availability of funds. For this reason, the site is neutral and provides a richer context in which to collect data. Using three cases within one site also reinforces consistency for data collection, a type of replication which contributes to reliability (Yin, 2009, p. 45).

Procedures

Once the topic was established, the researcher sought to identify possible sites for the study. In an exhaustive radial search, 37 public high schools in seven counties in a

state in the southeastern United States were contacted either by phone or by email to determine the use of tables in their classrooms. Reflective of the distinctive non-use of tables in a public high school setting, the only school that met the criteria of having a language arts, math, and social studies teacher who all used tables exclusively was the researcher's own school, thereby justifying the site. Next, permission to conduct the study was sought from the school district of the site and the building's administration (see Appendix E). A proposal was formulated and Institutional Review Board (IRB) approval was secured prior to the onset of the study to protect student, teacher, and administrative participants (see Appendix F). Site administrators and teachers were then solicited for participation in the study (see Appendix G). Upon agreement, each of the six criterion-selected teacher and administrator participants were asked to sign consent to participate forms (see Appendices C and D) and then briefed on procedures previous to the selection of student participants in order to prevent irregularities and to minimize barriers to instruction during periods of data collection. School enrollment and scheduling records were used for purposeful maximal sampling (Creswell, 2007) to identify potential student participants within the cases. Stratified purposeful sampling (Patton, 1990) was then used to garner a varied sample in terms of subject, gender, class rank, and course level for each case. Emails were then sent to teacher participants to schedule classroom visits for the purpose of introducing the study to the selected cases (see Appendix H). Student participants were given hard copies of the consent and assent forms (see Appendices A and B). An email was also sent home to parents with these forms attached (see Appendix I). A total student sample size of 59 was used. All of the students contributed to at least

one of the data types, but only 22 of the students were identified to participate in interviews—eight from language arts, six from math, and eight from social studies.

Data was collected using a variety of methods. Documents from administrators and teachers were investigated to identify any data related to pertinent participant behaviors and classroom practices. Archival records were used to collect data related to student conduct and academics. Additional archival records were used to explore the costs associated with the purchase and upkeep of tables. Interviews using questions (see Appendices J, K, and L) and photographs were conducted for the three administrator, three teacher, and 22 student participants. Scheduled interviews for teachers and students were conducted within their usual classrooms. However, scheduled administrator interviews were conducted at a table in a neutral location. Transcripts of all the interviews were made, and member checks were utilized to enhance credibility. Scheduled observations were conducted six times for each case—three times in person and three times using video recording. Physical artifacts (student work samples) were examined and photographed. Data observation/analysis forms (see Appendix M) and field notes were created for all the data collected. A database was created to store the data (Yin, 2009, p. 119). Data was then analyzed using pattern matching, explanation building, time-series analysis, logic models, and cross-case synthesis (Yin, 2009, Chapter 5). Ample methods for establishing trustworthiness and ethical constraints were also built in to the study.

Researcher's Role

As the primary researcher, I am solely responsible for establishing the procedures, collecting and analyzing data, and reporting the findings for the study. I am accountable

for instituting trustworthiness and maintaining the highest ethical standards of the research process. I am a teacher at the site that was used for the study, which afforded me several advantages. The benefits of my position to the study included: (a) professional and logistical support from my employer, (b) proximity to records, (c) convenient access to the participants for scheduling interviews, (d) familiarity with the layout of the site, and (e) my recognition to students. All of these factors allowed for the least intrusive collection of data. It was important to me as the researcher to collect rich and authentic data that was not overly influenced by an "outside presence." It was my hope that the participants saw me as part of their regular environment and not as a stranger, which helped to prevent marginality (Hammersley & Atkinson, 1995). Because I am a teacher at the site, and because I use tables in my own classroom, I gave special consideration to the prevention of bias. Much emphasis was placed upon bracketing out my personal experiences, particularly in relation to feedback from the other instructors. Merriam (1988) recognized that a researcher was likely to have biases that might impact a study. Instead of trying to eliminate subjectivity, it is better to identify it and monitor it in relation to the collection and interpretation of data. In this vain, I continually checked myself throughout the data collection, interpretation, and presentation processes using a series of questions (see Appendix N). It should be noted that I hold no authoritative position at my school. The three teachers who served as participants all have similar levels of experience and standing to me. To avoid additional bias and undue influence, the student participants were stratified (Patton, 1990) from the study if they were previously enrolled in my class. All attempts to avoid future enrollees were also made. I made every effort to interpret the data based only upon the findings and not on my own

propositions. The use of two research auditors aided in this process. While my employment at the site of the study had minor contraindications, the reliability afforded by the criterion met at my school made it the best place to collect data and certainly substantiated the use of case study design. The use of three cases, each representing a different subject area, provided optimal transferability.

Data Collection

Data collection did not begin until Institutional Review Board (IRB) approval was granted (see Appendix F). Permission to collect data was also given by the site and school district administration (see Appendix E). Six sources of evidence were used to collect data for the study: (a) documentation, (b) archival records, (c) interviews, (d) direct observations, (e) participant observations, and (f) physical artifacts (Yin, 2009, Chapter 4). Each technique was used to elicit specific and substantive data, allowing for a thorough analysis and the development of a "true picture" of the phenomenon. Because no single source has a complete advantage over the others, but instead they complement each other, a good case study uses as many sources as possible (Yin, 2009, p. 101). Interviews, direct observations, and participant observations provided the bulk of the data collected, but the use of documentation, archival records, and physical artifacts provided peripheral evidentiary support that helped to establish a thorough understanding of all aspects related to the topic. Careful collection, handling, and documentation of the data were emphasized. Additionally, a formal database was used to store data electronically, promoting accurate data within and across cases to ensure its independence from the research manuscript (Yin, 2009, p. 119). To avoid researcher bias, preliminary findings

were reported to two critical colleagues in order to document any contrary findings (Yin, 2009, p. 72).

Documentation

Administrative and instructor records were used as a potential source of data collection. These included teacher-administrative communications, teacher lesson plans, and classroom behavior logs. Specifically, these documents were used to garner any information related to the use of tables within the cases and to further investigate data resultant from the interview process. For case studies, the most significant use of documents is to corroborate and augment evidence from other sources (Yin, 2009, p. 103). Electronic copies of documents were made and stored in the database. Data observation/analysis forms (see Appendix M) with sections tailored to the research questions were correlated to record relevant details of the documents as related to the topic and cases.

Archival Records

Several types of school records were examined in relation to the use of tables in the classrooms that served as cases for the study. These included student profiles, student conduct records (classroom and administrative), student academic records, and budget records. Electronic copies of the records were made and stored in the database. Because the role of tables was explored in relation to achievement constructs such as attitude and self-efficacy, records related to student backgrounds, behavior, and academic performance provided additional data pertinent to those constructs. Additionally, school financial records were examined to establish the costs associated with the purchase of tables and their upkeep. However, because the archival records were produced for

specific purposes and not for the case study itself, careful consideration was given to their usefulness and accuracy (Yin, 2009, p. 106). Data observation/analysis forms (see Appendix M) with sections tailored to the research questions were used to record relevant details of the records as related to the topic and cases.

Interviews

Open-ended interviews using Creswell's (2007) Interview Protocol were conducted to collect data from participants (see Appendices J, K, and L). To aid in this procedure, photographs of traditional classrooms with desks and non-traditional classrooms with tables were also used during the interviewing process (see Figures 1 and 2). Scheduled one on one interviews were conducted for the three teacher participants

Figure 1. Picture of Classroom with Traditional Desks. Photograph by author.

Figure 2. Picture of Classroom with Tables and Chairs. Photograph by author.

and the three administrator participants (see Appendices K & L). Scheduled one on one interviews were also conducted for the 22 student participants (see Appendix J) who were identified through stratified purposeful sampling (Patton, 1990). Interviews for teachers and students were conducted within the classrooms contained in each case. However, administrator interviews were conducted at a table in a neutral location. These settings allowed for specificity and accuracy of information by providing a tangible reference for participants. In addition to following a specific line of inquiry evidenced in the protocol, all conversational questions were intentionally delivered in an unbiased, non-threatening, and open-ended manner (Yin, 2009, p. 106). All of the interviews were recorded using audiotapes to ensure the accuracy of responses in the transcriptions (Yin, 2009, p. 109). The interviews were transcribed using pseudonyms and then entered into a database.

Member checks of the transcriptions were implemented for credibility and then reviewed by two critical colleagues to ensure the prevention of bias. Upon finalization of the transcripts, the audio tapes were destroyed. The transcripts were then color coded according to construct applicability to prepare them for analysis.

Direct Observations

A common research procedure to increase the reliability of observational evidence is to have more than a single observation (Yin, 2009, p. 111). For this reason, three scheduled direct observations were conducted for each case (see Appendix O). These videotaped observations were approximately 50 minutes in length. Recording on videotape raises several issues, like keeping disturbing room sounds to a minimum, deciding on the best location for the camera, and determining whether to provide close-up or distant shots (Creswell, 2007, p. 141). In consideration of these, the camera was placed strategically where it would not be bumped or pick up excessive sound. Additionally, only distance viewing was used during these observations to specifically address the constructs of community-building, environmental dynamics, and teacher efficacy. A video camera was set up and turned on before class time within each specified case. The camera was placed in a different location in the classroom each time to optimize variety in the data. The camera was turned off and retrieved after the end of class time. Electronic files of the videos were made and stored in the database. Classroom data observation/analysis forms based on Creswell's (2007) Observational Protocol (see Appendix M) were completed for each of the three direct observations for each case. Research notes were then added on top in coordinating colors coded for construct

applicability in order to record the researcher's identification and interpretation of the videotaped data (see Appendix P). All forms were stored in the database.

Participant Observations

Three scheduled participant observations were conducted for each case (see Appendix O). These in-person visits provided opportunities for the researcher to experience the participants' reality from the viewpoint of someone inside the case study rather than just by an external view. They also helped to produce a more accurate portrayal of the case study phenomenon (Yin, 2009, p. 112). Observations were approximately 50 minutes in length. The researcher varied positioning for each observation to maximize exposure to data. These observations provided a closer look at the nuances of student and teacher behavior that was not always evident in the direct observations. Classroom data observation/analysis forms based on Creswell's (2007) Observational Protocol (see Appendix M) were used to document field notes during each observation. Research notes for these observations were then added on top in coordinating colors coded for construct applicability in order to record the researcher's identification and interpretation of the data as it related to student and teacher functioning and interaction (see Appendix Q). All forms were stored in the database.

Physical Artifacts

Student work samples from the entire school year were examined as artifacts. These were made available to the researcher through classroom portfolios and displays. Electronic photographs of the artifacts were taken and stored in the database. These chronicles of work allowed for a broader perspective concerning all of the classroom applications over the length of the school year, beyond that which could be directly

observed during the observations (Yin, 2009, p. 133). The student work samples were explored specifically for their implications to student self-efficacy (individual grades and student feedback), community-building (group projects), and environmental dynamics (to include considerations such as size, movement required, construction, etc.). For these reasons, the relevance of the artifacts became an important component to each of the cases (Yin, 2009, p. 113). Classroom data observation/analysis forms based on Creswell's (2007) Observational Protocol (see Appendix M) correlated for a selection of the artifacts were completed for each case in order to systematically identify any connections between the student products and the possible influence of the use of tables in their construction. Color coded research notes were also added on top of these data collection forms to identify construct applicability (see Appendix R).

Data Analysis

Four propositional constructs were chosen as part of the research design in order to appropriately examine and link data during analysis (Yin, 2009, p.34). A combination of theory, educational practice, and correlation to achievement were considered in selecting the constructs. In preparation for data analysis, each of the propositional constructs was color coded—yellow for attitude, pink for self-efficacy, blue for community-building, and green for environmental dynamics. Additionally, the data observation/analysis form based on Creswell's (2007) Observational Protocol (see Appendix M) was specifically tailored to organize observational and reflective notes in these four areas, which proved to be effective for documenting and categorizing data at the same time. Color coded research notes were also added to the forms for direct observations, participant observations, and physical artifacts to initiate analysis of the

data (see Appendices P, Q, and R). Five procedures based on the methodologies of Yin (2009) were then used to analyze the data: (a) pattern matching, (b) explanation building, (c) time-series analysis, (d) logic models, and (e) cross-case synthesis. Due to the varied nature and vast amount of the data collected, the use of all five analytic techniques allowed for a thorough and compatible analysis of the data from each type of evidence.

Pattern Matching

For case study analysis, one of the most desirable methods is pattern-matching logic (Yin, 2009, p. 136). For this research, pattern matching was used within the individual cases to establish any common themes related to the propositional constructs of attitude, self-efficacy, community-building, and environmental dynamics. This technique was used predominantly to analyze the data collected from interviews, direct observations, and participant observations. The possibility of coincidental patterns was also acknowledged to strengthen the internal validity of the study (Yin, 2009, p. 136). Additionally, rival explanations of patterns were explored to strengthen validity (Yin, 2009, p. 139). Both of these concerns were also addressed in the last stage of analysis to establish confidence.

Interviews. To begin this process, the student interview transcriptions were organized by case, and the teacher and administrator transcriptions were grouped by type of participant. This allowed for pattern matching to be applied to all three types of participants. Considerable time and space was devoted to the analysis of participant responses (Stake, 1995, p. 66). First, the transcriptions were read, and specific responses were highlighted to correlate with one or more of the four propositional constructs. Next, an inventory of notable responses was made for each of the four constructs for each case

and for the teacher and administrator groups. For example, all the student responses from the language arts case related to attitude, as indicated by yellow highlighting, were listed and then inventoried dependent upon the number of similar responses. This established a set of themes for student attitudes in language arts that could be listed according to their degree of matching (Yin, 2009, p. 140). This process was repeated for each construct within each case using the student responses. Next, an inventory of teacher responses was made for teacher self-efficacy, perception of community building, and perception of environmental dynamics. Last, an inventory of administrator responses was made for teacher efficacy, community-building, and environmental dynamics. Only these specific constructs were prevalent in the teacher and administrator interview responses. These inventories were ultimately used to create tables for the cross-case synthesis analysis which is discussed later in this section.

Direct and Participant Observations. Pattern matching was also used to analyze the data from the direct and participant observations for each case. Data observation/analysis forms based on Creswell's (2007) Observational Protocol (see Appendix M) were completed during the viewing of all three direct observations, as well as during all three classroom visits for each case. Because the form was tailored to automatically categorize notable behaviors according to the four propositional constructs providing focus for the study, it was an effective way to document descriptions and reflections for analysis. Additionally, in order to determine the degree of pattern matching for a case (Yin, 2009, p. 140), numerical notations were calculated on the forms for a response each time it was repeated. This allowed the researcher to easily identify significant themes for each observation, and in turn, to compare similar notations

cumulatively for each case. Once recognized, the most significant themes within each construct area were then highlighted on the observation/analysis forms to expedite future retrieval.

Explanation Building

Explanation building is actually a special type of pattern matching, but the procedure is more difficult so it deserves separate attention. Its use is intended not to conclude a study but actually to develop ideas for further study (Yin, 2009, p. 141). It was especially relevant for this research because of the exploratory nature of the study. This type of analysis was used for all six types of evidence in this study—documentation, archival records, interviews, direct observations, participant observations, and physical artifacts. Because explanation building is more narrative in nature, it allowed for a thorough examination of each type of data in its relation to not only the construct propositions, but also to the rival explanations that emerged. Compared with the other analytic techniques, explanation building was the most effective in rejecting the rival explanations, which contributed to a higher level of confidence in the findings (Yin, 2009, p. 134). This was also a necessary component in transitioning to a purposeful and focused discussion of the findings.

Time-Series Analysis

Complex time-series analysis was used to examine data representative of changes over periods of time. Because student participants received instruction in a table exclusive classroom for an entire school year, and because teacher participants were exposed to the same condition for several years, this type of analysis allowed for an exploration of varying responses to the same stimuli over time. In this regard, many of

the interview responses from the participants were significant for time-series analysis, especially in relation to the constructs of attitude, community-building, and student and teacher self-efficacy. Additionally, time-series analysis was useful in assessing the academic records of the student participants, where some records contains as much as three years of quantitative data. Used in conjunction with explanation building, which includes rival explanations, the time-series analysis method helped to establish a longitudinal "picture" indicative of the use of tables over time, specifically in relation to the constructs mentioned above. Time-series analysis was used for individual cases first, and then it was used during cross-case analysis to check for contrasting patterns between cases (Yin, 2009, p. 146).

Student and Teacher Interviews. After the student and teacher interviews were coded for the constructs of attitude, self-efficacy, community-building, and environmental dynamics, it became apparent that several themes emerged related to changes over time. The emotional comfort level of students surfaced as the most significant of these. Interview responses from both students and teachers reflected a change over time in student comfort levels, which were most closely linked to the theoretical propositions associated with community-building and self-efficacy. To further represent this data, a graphic and several tables, which are discussed in Chapter 4, were created to conceptualize these gradual affective changes in students throughout the course of the school year. Rich explanations were then developed to address the complex pattern of outcomes in order to further substantiate the findings (Yin, 2009, p. 146).

Academic Records. Although the purpose of this research was not to directly link the use of tables to academic achievement, the study was designed to explore how the use of tables may relate to several constructs that are linked with achievement. For this reason, the academic records of the student participants were examined in order to establish foundational evidence to support further research with regard to the use of tables. A list of all student participants within each case was made with concurrent academic grades for the pertinent case's subject area noted. No other course subject grades were included within individual case lists. Additionally, because student participants from a variety of grade levels were intentionally used in the study, the number of consecutive academic grades also varied between participants in each case. Next, a graph was created, which is presented and discussed in Chapter 4, to conceptualize any possible significance for the use of tables versus desks for each case and then across cases. While this visual data does contribute to the need for additional research, it should be noted that several real-life rival explanations (Yin, 2009, p. 135) likely account for many of the students grades over time. Student performance may have been influenced by any number of variables other than seating. Relationships with teachers, preference for particular teaching strategies, school setting, maturity levels, or change in course level are examples of such variables.

Logic Model

A logic model is a visual that deliberately stipulates a complex chain of events over an extended period of time (Yin, 2009, p. 149). In this way, it can be similar to time-series analysis; however, logic models often indicate sequential stages (Yin, 2009, p. 150) or cycles of behavior instead of just identifying events from point A to point B. A

combination of data from the documentation, interviews, and observations was used to construct the logic model for this study. A logic model of a rectangular table, which is presented and discussed in Chapter 4, was created to conceptualize the interactions of students and teachers in a classroom that uses tables. The model relies on empirical data found in relation to the propositional constructs of attitude, self-efficacy, community-building, and environmental dynamics. The logic model itself was also used to analyze any relevant aspects of the six seating arrangements used by the teachers in the cases. Every attempt was made to match the empirically observed evidence to the theoretically predicted events (Yin, 2009, p. 149) relevant to a table setting.

Cross-Case Synthesis

The last method of analysis that was used was cross-case synthesis. This was of particular importance because multiple cases were used in this study. Because at this point all of the data was categorized or coded in relation to the four propositional constructs of the study—attitude, self-efficacy, community-building, and environmental dynamics—the application of cross-case synthesis was relatively easy and highly effective in establishing the general findings. Eight tables, which are discussed throughout Chapter 4, were created to compare the interview responses from participants in each case according to salient representation of the propositional constructs. The tables were then cross-checked against the categorized/color-coded data observation/analysis forms for the other five types of data in order to establish a well-triangulated narrative of the findings. All six types of evidence were analyzed in conjunction with the other four kinds of analysis in order to identify significant themes across the cases and to establish literal and theoretical replication (Yin, 2009, p. 140). Every effort was made to develop

strong, plausible, and argumentative interpretations that were supported by the data (Yin, 2009, 160). In particular, it was important to apply cross-case synthesis to the use of tables versus desks in general, but then also to apply it more specifically between the language arts, math, and social studies cases themselves.

Summary

To ensure high-quality analysis, Yin (2009) offers several suggestions: (a) attend to all the evidence, (b) address all major rival interpretations, (c) address the most significant aspect of the case, and (d) rely on one's own prior, expert knowledge (pp. 160-161). All of these were implemented throughout the duration of the study to assure effective analysis of the data.

Trustworthiness

Several measures were implemented to ensure the trustworthiness of the study. First, to lend credibility to the findings, two critical colleagues were used during data collection and to verify data documentation (Yin, 2009, p. 72). A university professor with a background in conducting and teaching qualitative research and a veteran language arts instructor of 34 years who specialized in classroom strategies served as research auditors. Comprehensive member checks for all interviews were also conducted prior to the creation of the tables and figures to ensure cohesiveness between the data forms. Triangulation was achieved through the use of three cases representing three different core subjects, as well as through the use of six types of evidence by which to collect data. Secondly, detailed and accurate documentation procedures, like the database, were utilized to generate an audit trail in order to increase dependability. Additionally, the use of three different core subject cases, plus maximum variation of student sampling,

enhanced transferability of the findings. Confirmability was achieved through a strict, detailed report of the findings resultant from an informed interpretation of the data and not upon predispositions. The thorough collection of data and its analysis allows for replication of this study.

Ethical Considerations

Several procedures were used to ensure the ethics of this study. First, Institutional Review Board (IRB) approval (see Appendix F) was obtained prior to data collection. Pseudonyms were used for the site and for all participants to ensure anonymity. Confidentiality was strictly guarded through professional and accurate handling of the data and its storage. All data was secured in locked filing cabinets or within a password protected database for the duration of the study. All data will be destroyed after three years; paper documents will be shredded, and electronic data will be deleted and erased. Audiotapes of the participant interviews were destroyed upon the completion of transcription, member checks, and review by the critical colleagues. While the criteria met by the site highly warrants the location of the study, I still made every effort to prevent influence or bias during and after the study because of my employment there. Bias was avoided by bracketing out (Merriam, 1988) my own experiences, through the use of critical colleagues, and by a reliance on a large variation of data types. It should be noted that I did not and still do not hold any authority over the other teachers who participated in the study. Additionally, none of my own students served as participants.

CHAPTER FOUR: FINDINGS

The purpose of this exploratory (Yin, 2009), collective (Stake, 1995, 2006) case study was to investigate the affective and psychomotor conditions experienced by students and teachers when tables and chairs were used instead of desks in three classrooms in a public high school. Language arts, math, and social studies cases were intentionally selected for examination because these subjects do not traditionally utilize tables as is often seen in science classrooms. The use of three subject areas also helped to reinforce triangulation by providing a spectrum of evidence that contributed to the transferability of the findings. Ultimately, high school educators would want to know what effects tables have on academic achievement prior to implementing their use in a classroom; however, little to no empirical evidence exists in this area. Accordingly, it was important to first establish a foundation upon which this type of research could be built. Therefore, this study was specifically designed to explore what role tables have in relation to constructs known to be linked to achievement—attitude, self-efficacy, community-building, and environmental dynamics. These constructs were identified to serve as viable propositional lenses by which to gather evidence and to eliminate confounding variables for future research in the area of academic achievement related to the use of tables.

Six sources of evidence were used to collect data for the study: (a) documentation, (b) archival records, (c) interviews, (d) direct observations, (e) participant observations, and (f) physical artifacts (Yin, 2009, Chapter 4). The following is a specific list of sources from within the educational setting that were used to garner data—teacher lesson plans, classroom behavior logs, student profiles, student conduct records, student

academic records, budget records, student interviews, teacher interviews, administrator interviews, videotaped classroom observations, in-person classroom observations, and student work samples. Additionally, five different techniques were implemented to analyze the data: (a) pattern matching, (b) explanation building, (c) time-series analysis, (d) logic models, and (e) cross-case synthesis (Yin, 2009, Chapter 5). This combination significantly reinforced triangulation by providing ample sources and analytic processes upon which to establish the findings.

Five research questions were created to guide the study. The first addressed the general nature of the topic, and the other four specifically focused on the propositional constructs linked to achievement. The following questions were used:

1. What are the experiences of high school students and teachers when tables and chairs are used in a classroom instead of traditional desks?
2. How does the use of tables and chairs instead of traditional desks affect student and teacher attitudes toward the educational process?
3. How does the use of tables and chairs instead of traditional desks affect student and teacher performance self-efficacy?
4. What are the possible community-building implications of using tables and chairs instead of traditional desks?
5. What physical environmental dynamics are present in a classroom that utilizes tables and chairs instead of traditional desks?

The findings for this chapter are presented according to each of the research questions. Portraits of the cases and the major themes established for the study are provided in the section for Research Question One. Then, in order to more explicitly associate the results

for the specific constructs for the remaining research questions, the findings are further organized into subsections according to cross-case themes. Additionally, subject-specific themes are presented. A summary of the findings is also provided.

Research Question One

What are the experiences of high school students and teachers when tables and chairs are used in a classroom instead of traditional desks?

The use of tables instead of desks in high school classrooms is rare and relatively unexplained in the educational community. Additionally, little research has been conducted to analyze what effects the exclusive use of tables may have on students and teachers. The first research question led to a better understanding of the way tables initially came into use in the three classrooms used in this study and how each of these classes operated throughout the school year. All six types of evidence from each case were used to generate the general findings of student and teacher experiences, allowing for the conceptualization of "the big picture" surrounding the use of tables at the site. The more specific findings related to affective and psychomotor effects on students and teachers that are associated with tables are presented in the findings under research questions two through five.

Administrative Approval to Use Tables

The decision to use tables in each of the three classrooms was based almost entirely upon teacher preference. The lack of any formal documentation or formal requests to make such changes in these classrooms revealed casual yet definitive support from administration for the use of tables. When asked about granting permission for the teachers to put tables into their classrooms, an administrator responded, "I knew that if

they were confident enough to ask for them, they would use them to the benefit of our students. These were already the teachers that were running classrooms with more varied instructional strategies going on in their rooms as opposed to more traditional instruction." This administrative validation of teacher efficacy was also evidenced through several responses during the administrator interview process (see Appendix S). In general, the administrators identified the teachers from each case as "collaborative," "strong disciplinarians," "skilled instructors," and having "students [that] are more emotionally secure." The administration at the site was also supportive of the use of tables as an effective strategy for community-building. Again, two out of the three administrators interviewed indicated that the use of tables "fosters dialogue," "promotes a friendly social climate," and "creates a sense of belonging" in students. The school leaders also deemed the use of tables as a more effective strategy versus traditional desks in relation to environmental dynamics. Two stated that the layout "promotes discussion and collaboration instead of 'sit and get.'" It was clear that the limited use of tables in the classrooms at the site was not due to any school or district policy adverse to the practice, but simply because few teachers had asked to put tables in their classrooms. It was found also that the cost to furnish a standard classroom with tables and chairs ranged between $1,038.00 and $2,397.06, which was dependent upon the style and quality of the furnishings selected. The cost to furnish a standard classroom with desks was $2,625.00. The highest quality tables and chairs were found to be more cost effective relative to purchase than traditional desks; however, no documentation was available to compare the cost of maintenance for both over time. Teachers were given considerable freedom in the

selection of tables and chairs, and ultimately how they would be used in their individual classrooms.

Table Use in Language Arts

When asked "What was your reasoning for using tables instead of desks," the language arts teacher replied, "Desks are not conducive to big kids. A lot of students at this school are tall or larger, and desks are very restrictive for them. Also, it's easier to move a chair than it is to move an entire desk. I don't have to move the tables all the time. I can just have them take a chair with them which is easier for maneuvering. It's about student comfort and student learning." This teacher's tables were also topped with whiteboard paint, making them "a tool as opposed to just a piece of furniture." The whiteboard-topped tables allowed students to write on the tables for a variety of classroom activities that included "group brainstorming" and "timeline construction," an activity in which groups of students write sections of a timeline on their individual tables, and then the tables are all lined up together to complete the timeline for class viewing. Fifty-four percent of this teacher's lessons for the year included strategic activities like these that incorporated the specific use of tables.

In addition to the use of tables for activities, the language arts teacher also used several different seating layouts in the classroom, each designed to accommodate specific activities. The Socratic circle seating arrangement (see Figure 3) was used for whole group discussion. In order to create this layout, the tables were formed into a square, and students sat around the perimeter only. This allowed each student the opportunity to see every other student during discussion. The teacher used this layout to promote contextual understanding and analysis of selected literature. Another configuration used in the

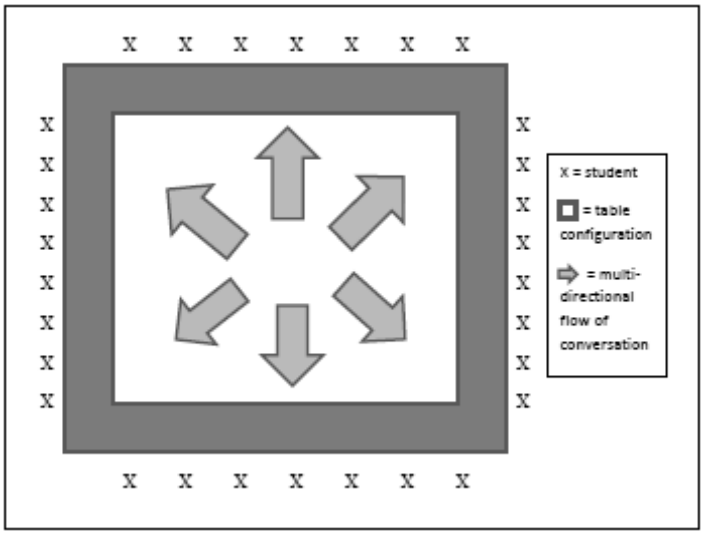

Figure 3. Socratic Circle Seating Arrangement in Language Arts. Image designed by author.

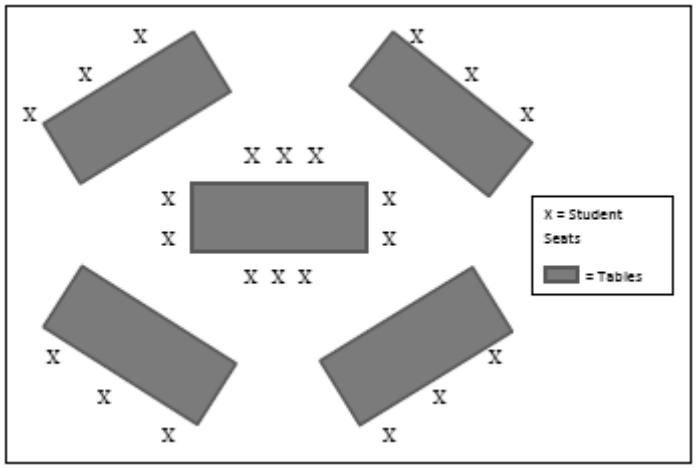

Figure 4. Socratic Seminar Seating Arrangement in Language Arts. Image designed by author.

language arts case was Socratic seminar seating (see Figure 4). For this layout, one table was placed in the center of the room with additional tables positioned in a "circle" around it. Students sitting at the center table discussed given topics out loud, and students sitting on the outer perimeter listened to the discussion. At pre-determined intervals, the students switched places. This arrangement was also used to reinforce contextual understanding

and literary analysis, but was often utilized for team-oriented or competitive activities like debate. For activities that typically required direct instruction from the front of the classroom, the language arts teacher utilized a lecture seating arrangement (see Figure 5). In this layout, the tables were placed linearly from the front of the room to the back with

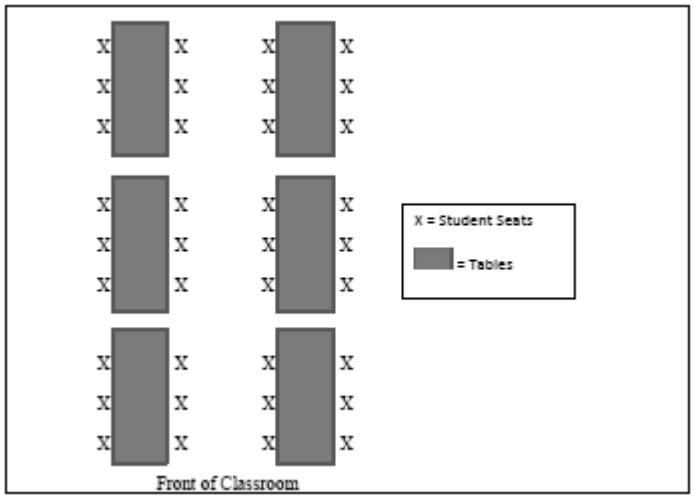

Figure 5. Lecture Seating Arrangement in Language Arts. Image designed by author.

chairs on both sides of the tables. This design allowed all students the ability to face the instructor. It also provided an aisle for technology such as a projector. The last configuration of tables used in the language arts case was a workshop seating arrangement (see Figure 6). The instructor initially referred to this layout as the "daily set up" because it was the one used most often. For this, the tables were spread out as much as possible with chairs placed around each. This design provided maximum seating and was used for individual or group activities. It also allowed the teacher 360^{o} access to each table of students. The language arts instructor was asked, "Given your choice, now that you have taught with tables and with desks, what is your preferred type of seating?" The teacher replied, "I'd rather teach with tables. I'd rather my students learn to work

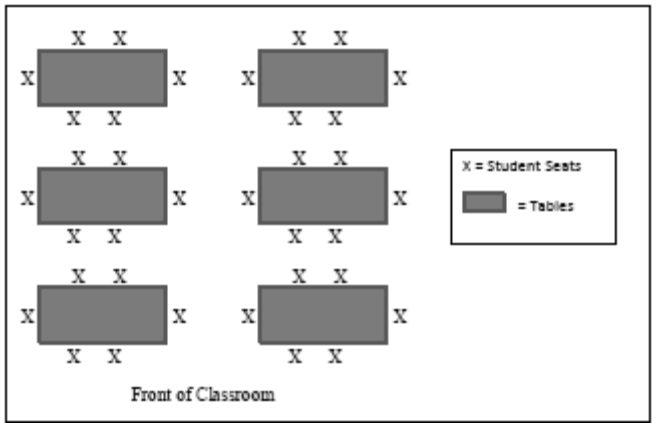

Figure 6. Workshop Seating Arrangement in Language Arts. Image designed by author.

together. I think the table setting is a more comfortable setting. More safe. Kids are more likely to take risks…Emotionally, it's like having a support group…it's more a family feel. Today, the kids were very sad to leave. Even though they may not have come in as friends, everyone accepts each other by the time they leave at the end of the year. So, I definitely think it's more of a close knit community."

Table Use in Math

The teacher from the math case made the decision to use tables in order to provide students with more opportunities to work together. When asked about the decision, the teacher replied, "I felt that collaboration among my students was probably the biggest thing that I was missing." The instructor said that the use of tables was particularly effective with lower functioning students: "I've seen a huge change in the amount of help they need from me. And I was being stretched so thin in this type of class that I didn't feel that I was reaching everybody. Now I don't know that I have to." Through observations, it was noted that this teacher moved around the room repeatedly and offered mini-lessons to individual tables. This practice was also noted in the instructor's

interview: “I can get around the room better, and if I’m speaking to one student at a table, technically I’m speaking to all the students at the table.”

The math teacher relied upon a stadium seating arrangement (see Figure 7)

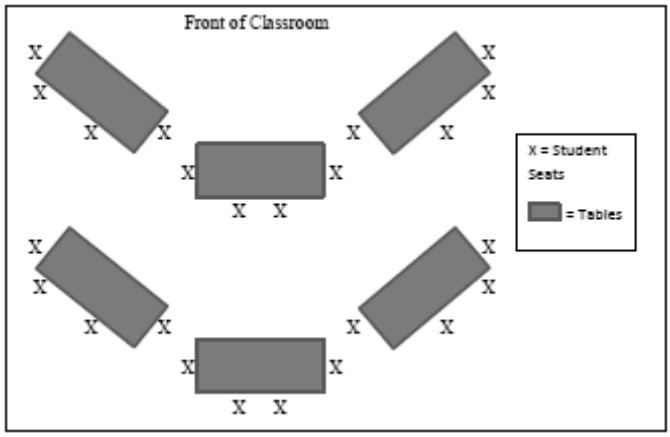

Figure 7. Stadium Seating Arrangement in Math. Image designed by author.

throughout the school year. This configuration allowed students to face the front of the classroom to receive direct instruction but also to work individually, in pairs, or in small groups each day. Thirty-seven percent of the lessons planned by this instructor included strategies involving the use of group seating.

Table Use in Social Studies

The social studies instructor began using tables as a way to increase the affective responses in students. When asked to explain this reasoning, the teacher replied, “I would hope that the students sitting around a table would emulate what a family would do around the dinner table…as far as the closeness and the proximity of the person next to them without any desks in between them. Hopefully, it would create a more open and family-oriented atmosphere.” The instructor became an integral part of the change that took place in the classroom: “I feel more connected to my students. I think that the tables subconsciously have some kind of bonding effect.” To enhance the “family” atmosphere,

the social studies teacher relied heavily on collaborative strategies throughout the year. The lesson plans for this case indicated that 73% of classroom activities involved group work at tables. This instructor chose a concentric circle seating arrangement (see Figure 8) as a way to support these types of lessons. This table set up was used daily throughout

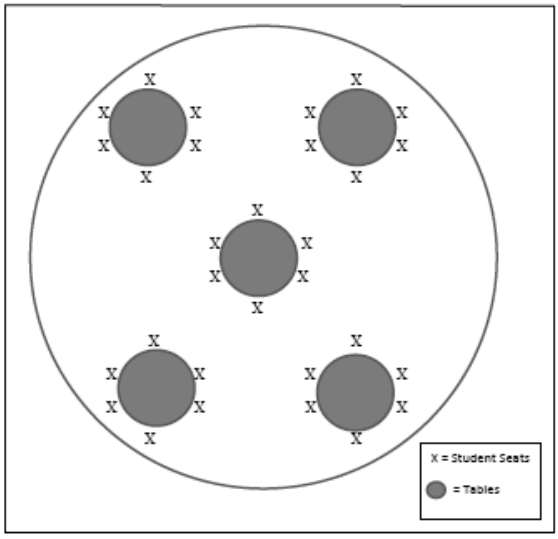

Figure 8. Concentric Circle Seating Arrangement in Social Studies. Image designed by author.

the school year. In this classroom design, tables were spread out randomly with chairs around the entire perimeter of each. This layout afforded students the opportunity to discuss issues in a small group and then compare their conclusions with those of other groups. During this process, the instructor acted as a facilitator, moving from group to group initially and then coordinating the whole group discussion. This movement was noted as a pivotal part of the instructor's daily routine: "I think that I move around really well. Some people might like one position, but I like lessons where I move around. I never stay in one spot very long. Sometimes I write on the board or show something on the projector, but usually I move around a lot." This combination of group activities and fluid monitoring was documented in each observation for this case.

Positive Experiences of Administrators and Teachers

During the time that this study was conducted, the school used as the site only housed four table exclusive classrooms out of 36 possible. Even so, the common experiences of administrators, teachers, and students in relation to the three classrooms examined were positive overall (see Figure 9). It was also noted that the experiences of

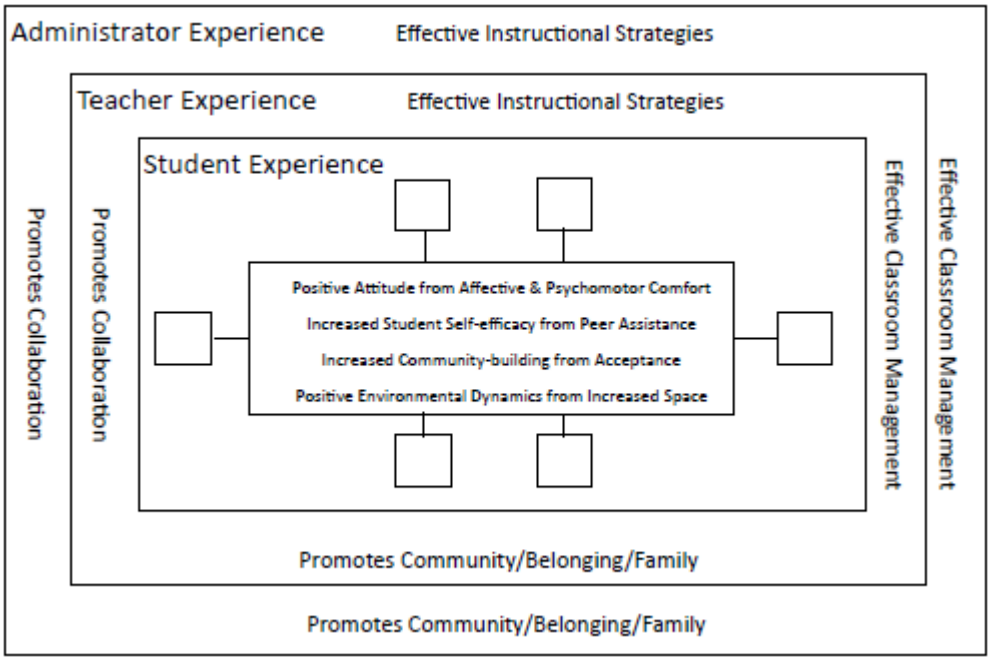

Figure 9. Logic Model of Predominant Student, Teacher, and Administrator Perception of High School Classrooms with Tables. Image designed by author.

administrators and teachers were significantly aligned in four areas related to the use of tables: (a) *collaboration,* (b) *community,* (c) *classroom management*, and (d) the use of *instructional strategies.*

Collaboration. The teachers in each case identified themselves as using more collaboration, a finding that was corroborated in the administrator interviews, where two of the three administrators stated that the teachers that use tables at the site are more "collaborative in nature" (see Appendix S). These findings were confirmed by the direct and participant observations in each case as well. The teachers tended to rely more

heavily on partner and group activities even when direct instruction was being given. It was also evident from the instructor lesson plans and room configurations that collaboration was a regular and intentional strategy used by each of the teachers. Student interview responses were also a reflection of a collaborative community: "We ask each other questions," "We do activities that include everyone," "We work together," and "You can work out problems together." Collaboration was shown through the data for documentation, interviews, direct observations, participant observations, and physical artifacts in all three cases.

Community. As one of the four constructs that provided focus for the study, community-building proved to be a distinct and significant result of table use in the high school cases. Participants of each type indicated that classrooms with tables helped to foster a sense of community. An administrator commented, "It allows the students the opportunity to share that community feeling." Teacher responses included phrases like "sense of community" and "community atmosphere." While the student participants did not specifically use the term "community" in their remarks, participants in each case repeatedly used words like "we," "together," "group," "friends," and "depend on people." Additionally, it was noted in the observations for each case that the students at tables typically worked together, helped each other, and acted as a unit within the larger classroom setting. In several participant observations, it was noted that the instructors actually called upon whole tables during classroom discussion instead of calling on individual students.

Classroom management. It was evidenced, or actually determined through a lack of evidence, that no misconduct from students within any of the three cases throughout

the course of the year could be attributed specifically to the use of tables. This is not to say that no misbehavior ever occurred within the cases used in the study, but simply that tables were typically not the source. One administrator commented, "We have more discipline problems when students are sitting behind one another than when they are sitting side by side." Additional administrator responses indicated that the teachers who chose to use tables in their classrooms were all "strong disciplinarians" and "good classroom managers." The observations of each case confirmed this finding, where each instructor was noted as "organized," "in control," and "respected" by their students. Little to no disciplinary actions were observed in the cases, because for the most part, the students remained attentive to the teachers and engaged in the lessons. However, teachers and students in all three cases indicated that the use of tables did promote more socialization than classes that use desks. This "talking" was not necessarily seen as a discipline problem from either type of participant, but more of a distraction. This issue is discussed more fully in the Negative Experiences section later in this chapter.

Instructional strategies. As revealed by the instructor in the language arts case, the use of tables was not just a comfortable seating alternative, but more of a strategic tool that enhanced lessons where groups of students had the opportunity to interact, write, discuss, share, and perform. The teacher's enthusiasm and purpose in using tables was evidenced with phrases like "learning tool," "conducive to learning," "independent and cooperative working environments," and "more productive to learning." Similarly, the math teacher was found to have high regard for instructional strategies related to table use through phrases like "learn collaboratively," "teach each other," "learn to discuss mathematics," and "standards." It was also shown that the instructor in the social studies

case relied significantly upon tables to foster specific learning goals as evidenced through phrases from interview responses like "collaboration," "cooperative learning," "clusters," and "small group advocate." Additionally, it was noted in two of the direct observations and one of the participant observations of the Social Studies case that "student interaction" at and between tables was specifically used as a strategy. An administrator corroborated this finding by saying "I see more varied instructional strategies going on in their rooms as opposed to more traditional instruction." Many of the students also acknowledged the use of varied instructional strategies in their classrooms: "We do activities instead of busy work," "It's not boring," and "It's more fun." While the use of these intentional table strategies was evident in each of the cases, it was also discovered that all three teachers were unsure if the use of tables could definitively be linked to their students' academic achievement. Each assumed that using tables fostered achievement in their students, but none could offer any specific evidence to support their suppositions. This finding is highly significant in that it reinforces the need for empirical evidence on the topic, not only for future teachers considering the use of tables, but also for those currently implementing their use.

Positive Experiences of Students

Students' thematic responses were significantly positive for each of the propositional constructs, where *comfort* emerged as the predominant theme in relation to attitude, *help from others* in relation to student self-efficacy, *acceptance* in relation to community-building, and *increased space* in relation to environmental dynamics. Additional lesser themes will also be presented in the sections for the remaining research questions.

Comfort. Comfort was shown to be a significant result of table use for students, both emotionally and physically. It was found that students overall had an initially adverse attitude toward tables at the beginning of the school year, but over time cultivated a significant preference for them as their emotional comfort levels increased (see Figure 10). This finding was noted in several responses from students when they

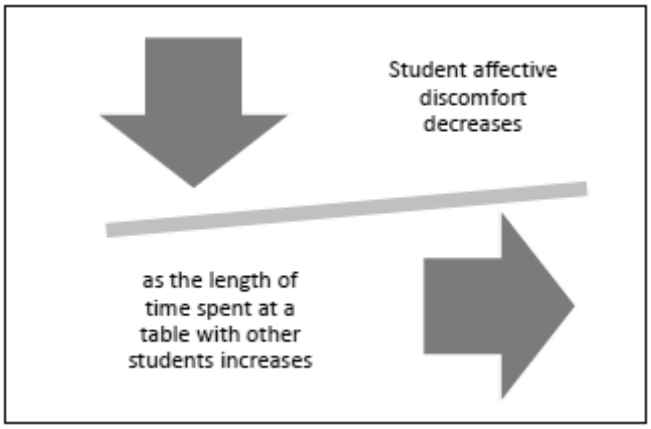

Figure 10. Timeline of Student Affective Response When Tables are used in Language Arts, Math, and Social Studies. Image designed by author.

were shown the pictures of two classrooms—one with desks and one with tables. The students described the pressure of "who do I sit with" as being a discomfort in a new class that had tables, as opposed to the "safety" of sitting alone in a new class that had desks. Varying responses indicated the shift in affective comfort level over time, to include "After a couple of weeks it's normal," "After a few months everyone sort of has their spot," "I would like to sit in desks the first half of the year and at tables the second half after I got to know everybody," "Having your seat moved to another table half-way through the year stinks because you have to start all over," and "By the end of the year it's like sitting with your brothers and sisters." Physical comfort for students was also found to be an important result of using tables. Because high school students are much

more like adults in terms of size, the additional space and ability to move more freely afforded by tables and chairs was noteworthy for the student participants. The language arts instructor was especially aware of this: "A lot of the students at this school are tall or larger, and desks are very restrictive for them…My students are more comfortable at tables." Likewise, the students repeatedly used words like "move," "comfortable," "spread," and "sprawl" to indicate their increased physical comfort when learning at tables. These findings were also noted in the classroom observations across all three cases. It was documented that students sat sideways, sat on their legs, rested their feet on the table legs, stretched their legs out, crossed their legs, sat with their entire legs folded in chairs, and at times, laid their arms and heads across the tables. Traditional desks would not afford the space for most of these physical behaviors.

Help from others. This theme resounded across all four constructs and within each case. Most significantly, *help from others* was found to contribute to student self-efficacy, where matching responses represented 62.5% of the interviewed students from language arts, 62.5% of the interviewed students from math, and 75% of the interviewed students from social studies (see Appendix T). In the math and social studies cases, students indicated that "help from others" contributed to positive attitude toward learning. In relation to community-building, the math teacher remarked that "students teach each other." Similarly, the social studies instructor confirmed this finding with "students help each other." In terms of environmental dynamics, students in the language arts and social studies cases commented that using tables made it "easier for the teacher to get around to help students." Overall for students, this theme was found to be one of the most meaningful components of using tables in the high school classroom.

Acceptance. Across the cases, it was found that students felt a sense of acceptance from their peers in table-exclusive classrooms. This was shown through interview comments like "I'm not alone," "The people at your table don't make you feel stupid," and "It's easier to make friends." The teachers corroborated this finding with remarks about students like "They are kind to one another," "They stand up for one another," "Everybody is accepted," "They act as a unit," and "You can't isolate yourself." This acceptance between students was also notable in the observations for each case. In the language arts class, it was specifically noted that no students were "isolated or silent toward the group." In the math case, it was repeatedly observed that all students experienced a high level of acceptance from the others, particularly when working out problems without the help of the instructor. They exhibited an "all for one" attitude that they deemed necessary prior to moving on to new material. The social studies observations also revealed acceptance between students—"high-fives," "handshakes," and "comments of affirmation" were documented during each of the lessons. In two participant observations, students in the social studies class exclaimed "sit with me" as students entered the room. It is likely that the sense of acceptance experienced by students across the cases was due to a combination of teacher expectation for behavior and the collaborative atmosphere created through table use.

Increased space. In relation to environmental dynamics, *increased space* was noted across the cases as the predominantly favorable attribute of learning at tables. Student interview comments revealed that 59% of the student sample mentioned "more space" as a contributing benefit to sitting at tables (see Appendix Y). In addition to personal comfort, students also stated that tables afford more space for belongings:

“”You can spread out your stuff,” “You don’t have to put your stuff on the floor,” and “There is more space for your stuff.” While the extra space afforded by tables was seen to positively influence student attitudes and comfort levels, it was also documented as a logistical benefit to many classroom activities requiring a large, flat work surface. A student in the language arts case remarked, “It feels like an art class.” Similarly, students in both the language arts and social studies classes said, “A table supports a big project better than a bunch of desks.” The language arts instructor agreed: “Tables provide a big work surface for projects.” An administrator echoed this sentiment with “more space to create projects.” Relative to environmental dynamics, the increased space provided by tables was overwhelmingly documented as a benefit for students.

Negative Experiences of Administrators, Teachers, and Students

While the affective and psychomotor experiences of the participants were generally positive overall, several common negative themes related to the use of tables also emerged from the data. For instance, the administrator participants were highly complementary of the teacher participants’ capabilities in their classrooms; however, they definitively cautioned against the use of tables in all classrooms because specific needs of individual teachers and students should remain a priority. The idea that *tables are not for everyone* was also reinforced through the teacher and student participants. Another common drawback to table use was *excessive socialization* between students, where “talking” was sometimes viewed as a hindrance to either learning or classroom management. Lastly, the negative theme documented the most significantly across the data was noted in relation to all four constructs, within all three cases, and by all three types of participants—that *cheating* was easier at a table.

Tables are not for everyone. In relation to teacher efficacy, the administrator participants stated teachers with "poor classroom management abilities" or "those that rely heavily on lecture" would not benefit from using tables and that "it takes time to get good at using tables." The instructors in all three cases confirmed this premise: "Some teachers just don't feel comfortable with tables," "It depends on the teacher," and "Using tables might be more specific to individual teachers and students." The math teacher summed it up this way:

> If you are the kind of person that likes your room in a very orderly manner, you probably don't need tables and chairs. Because the chairs are gonna be in a different spot at the end of each class. They're gonna move them no matter how many times you tell them. They're gonna lean back in chairs; they're gonna stick gum under the tables. All of that stuff happens. So if you're one of those people that you gotta be very orderly, I don't advise the tables and chairs, just for your personal emotional self every day. It took me a while to get over that. Cuz I'm like that. I want everything very organized. But the day I let go of that, and said you know what this is just the way it's going to be, it made things a lot easier. I think that's the biggest thing. And, uh, as far as your planning—you have to plan differently if you have tables. There's no point in having tables if you're just gonna stand up in front and talk. It's not worth it. You've got to have some activities.

In addition to tables not being the right choice for every teacher, the same is true for students. In terms of community-building, one administrator indicated that "some

students simply prefer to sit alone." The math teacher agreed with "I think there are students that don't like working with other people. That do deserve to have desks, and they do better by themselves." Of the 22 student participants, two stated, "I like desks better" because they preferred to work alone. Three students indicated that they felt desks were better for specific subjects.

Excessive socialization. Teachers and students from all three cases indicated that too much talking was sometimes a problem with tables. The instructors stated, "Socialization is the biggest drawback;" "The downside to it is sometimes the students can be very talkative;" "You always have one or two people in a class that just can't stop talking." The students agreed with comments like "It is distracting," "It is noisy sometimes," "It can get loud," and "There is too much talking sometimes." The responses from both teachers and students significantly showed that one's attitude toward the learning environment is significantly impacted by the socialization factor. Additionally, the teachers in each case expressed concern over their abilities to control the amount of non-academic student conversation in their classrooms. However, each also indicated that they would continue to use tables in spite of the "socialization factor." Disruptive talking was noted in participant observations in the language arts and social studies cases; however, both instructors quickly addressed the issues and redirected student behavior. On one hand, socialization was the driving strategy for using tables in the first place, but on the other hand, the table setting automatically lent itself to talking that was at times non-productive.

Cheating. Administrator, teacher, and student participants all agreed that cheating was a drawback to using tables. All three administrators stated that "cheating is easier

because students are sitting closer together" and that "table classrooms cannot be used for state standardized testing" for this reason. In the math and social studies cases, "cheating" was noted as a factor that negatively impacted students' attitudes toward learning. In relation to environmental dynamics, students in the language arts and social studies cases indicated that "sitting close together made it easier to cheat." However, no cheating was observed in the language arts class on a day when a test was administered.

While the above findings helped to create an understanding of the general experiences of the participants in the study, an examination of more specific results was necessary to establish or distinguish definitive links to the propositional constructs related to achievement. To begin this process, academic achievement in post-year table exclusive classrooms and previous desk exclusive classrooms for the same core subject for all of the student participants was compared (see Figure 11). No significant correlations between the use of tables and academic achievement could be drawn directly from the data collected, as was expected. An examination of grades for all student participants in each case for a two year period showed a highly inconsistent trend for achievement gain, achievement neutrality, and achievement loss. This finding justified the need to explore more specific variables linked to achievement in relation to the use of tables in core classrooms. It also necessitated acknowledgment of possible rival explanations for achievement gain, neutrality, or loss. Those findings are provided in the sections for research questions two to five.

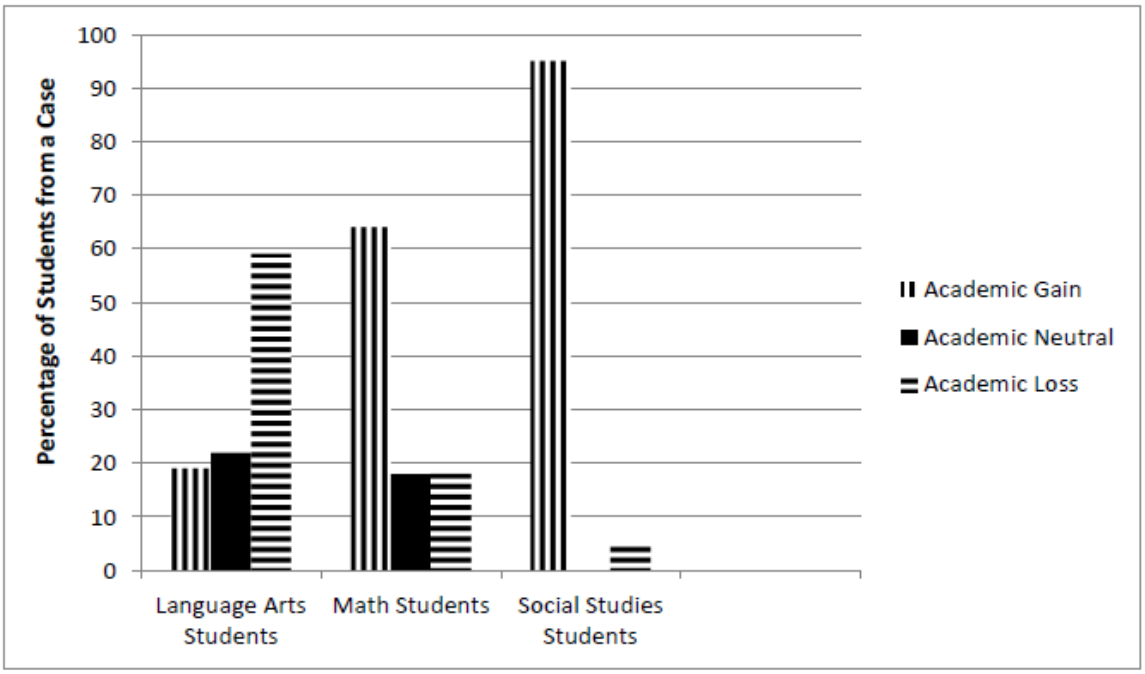

Figure 11. Student achievement: Tables vs. desks in language arts, math, and social studies. Image designed by author.

Research Question Two

How does the use of tables and chairs instead of traditional desks affect student and teacher attitudes toward the educational process?

Because student and teacher attitudes to learning have been found to impact achievement (Cakici, et al., 2011; Hemmings et al., 2011; Jackman et al., 2011), it was important to explore what role tables have in conjunction with this construct. This question led to a better understanding of the contributing effects of tables on students and teachers in terms of their outlooks toward learning and teaching. All data from each source related to attitude toward learning was coded in yellow in order to isolate specific responses or observations to this construct.

The following sections provide findings specifically related to attitude toward learning. The interview responses from the participants in each case were drawn from

student and teacher responses to all six interview questions from the interview protocols (see Appendices J and K). The perceptions of the classroom participants were used in conjunction with the administrator comments and the other five types of data to establish cross-case themes for this research question. Subject-specific themes are also discussed at the end of this chapter.

Cross-Case Themes Relative to Attitude

Several cross-case themes were identified in relation to attitude toward learning. The teachers in each case were found to be committed to the use of tables. Similarly, the students across the cases showed a preference for receiving instruction in a classroom with tables. Both teachers and students in all of three subjects also noted that certain distractions were common to table use, which was noted as a drawback.

Strong commitment. First, all three teachers were evidenced as having a *strong commitment* to the use of tables. Each stated that they would prefer to teach in classrooms with tables as long as that was an option: "I enjoy tables. I will never go back to desks if I can help it;" "I prefer tables. I really don't know that I'd want to go back to teaching with desks;" "Regardless of what type of class I'm teaching, I'd rather have tables." Additionally, the language arts instructor expressed that table use created "positive feelings," "excitement," and "more productivity" in the classroom. The math teacher stated, "My students work well together; why would I want to change that?" Similarly, the social studies instructor said, "I take the curriculum and modify that so that my students can work in clusters. That's just one of the things that I do because that's how I've always taught. I've always been a cooperative learning, clusters, small group

advocate for education. Tables are great for me." Each teacher indicated not only a preference for using tables, but also specific reasons associated with student learning.

Preference for tables over desks. The students echoed their teachers' enthusiasm for tables; of the 22 student participants, 19 indicated a preference for tables over desks for at least some of their classes (see Appendix U). Students cited an assortment of reasons for their affinity for tables, to include responses associated with both affective and psychomotor indicators. Overall, the students and teachers from each case had a positive attitude toward learning in a classroom with tables; however, negative experiences specifically related to attitude toward learning were also noted.

Distractions. In all three cases, students were quick to point out that learning at a table caused *distractions* sometimes (see Appendix U). These distractions included noise, movement, and interruptions from other students, all of which contributed negatively to student attitude toward learning. In the language arts case, four students identified the possibility of distractions as being associated with the use of tables. This finding was also noted in a direct observation of this case; students were given an individual assignment to work on in class and many of them became either bored or distracted by others. This result was identifiable through several types of unfavorable behaviors—fidgeting, sleeping, talking, and texting under the table. In the math case, distractions were attributed to talking and the physical conditions of the tables. In the social studies group, both the students and the instructor also expressed that "talking" and "noise" were distractions to learning.

Research Question Three

How does the use of tables and chairs instead of traditional desks affect student and teacher performance self-efficacy?

Because student and teacher performance self-efficacy have been found to impact achievement (Caprara, et al., 2011; Skaalvik & Skaalvik, 2011), it was important to explore what role tables have in conjunction with this construct. This question led to a better understanding of student and teacher confidence levels in the classroom that were linked to the use of tables. All data from each source related to attitude toward learning was coded in pink in order to isolate specific findings for this construct.

The following sections provide findings specifically related to student and teacher self-efficacy. The interview responses from the participants in each case were drawn from student and teacher responses to all six interview questions from the interview protocols (see Appendices J and K). The perceptions of the classroom participants were used in conjunction with the administrator comments and the other five types of data to establish cross-case themes for this research question. Subject-specific themes are also discussed at the end of this chapter.

Cross-Case Themes Relative to Self-Efficacy

Several common factors were found to significantly contribute to the themes of *positive student self-efficacy* and *positive teacher self-efficacy* in the table exclusive core classrooms. Replication of student responses from interviews indicated that students across the three cases experienced a high level of confidence in their abilities overall when sitting at tables in their core subjects (see Appendix T). Observations of student behavior corroborated their responses. Sub-themes for positive student self-efficacy

included (a) *help from others*, (b) *not alone*, (c) *asking and answering questions*, (d) *discussion abilities*, and (e) *independence*. The teachers from each subject area also showed predominant self-assurance in their interview responses (see Appendix V). Similar to the students, the actions of the instructors during observations also matched their interview answers. Several positive sub-themes emerged for the teachers: (a) *high level of confidence*, (b) *demonstrative teaching style*, and (c) *self-reflection*. Only one sub-theme for the instructors was shown to negatively impact their self-efficacy—*lack of control*.

Positive student self-efficacy. First, the most notable contributing factor to this result was the students' opportunity to ask for *help from others* at their tables as was noted earlier. Repeatedly, students from each case stated, "You can ask others for help," indicating that students came to rely on this strategy to enhance their own abilities. Secondly, replicated responses in each case also indicated that students felt more efficacious because they were *not alone*. Students repeatedly stated, "I like tables because I am not alone." Third, students showed a greater level of comfort in *asking and answering questions* in class, revealed through interview responses like "It's easier to answer questions because there are other people around you," "It's okay to be wrong," "It's okay to not know what the answer is," and "I get to interact better." This finding was noted within the interview responses for all three cases and during both the direct and participant observations for the language arts case. Students in each case also expressed increased skill level in their *discussion abilities* as evidenced with words like "understand," "explain," "communicate," and "discuss" in their interview responses. Another sub-theme that emerged in relation to student self-efficacy in each case was that

of *independence*. Phrases from the student replies like "more conscious," "I don't have to depend on the teacher," and "I feel more outgoing" showed that the students came to rely more on each other and themselves when tables were used. The interview comments from the math students particularly reinforced a sense of independence and control in relation to the learning atmosphere. This take charge attitude was a strong indicator of self-efficacy, where students used phrases like "learn to adapt," "sit near the front," "okay to be wrong," and "solve the problem by yourself." The ability to ask for help when necessary also reinforced this finding, as did observations of students tutoring one another. This self-reflection of ability was corroborated in the social studies case with student interview comments like "It helps me," "I can learn better that way," "I work better in a group," "I can interact better," and "It makes learning much easier for me." This confidence was also documented in the social studies classroom observations when students shared personal successes in an activity: "I got a 100 on a math test yesterday" and "I thought we did a good job at the workshop." Together, these aspects showed that students experience a greater sense of self-efficacy when sitting at tables because of the support received from other students. While a variety of negative responses were given by individual students in relation to self-efficacy, no common negative themes were identified across the cases for this construct.

Positive teacher self-efficacy. Thematically, all three instructors exhibited *positive teacher self-efficacy*. This finding was evidenced through a variety of data where several contributing factors were noted. First, the teachers each showed a *high level of confidence* in the activities they designed to use in conjunction with tables. The teachers used phrases like "activities are more effective," "activities that are absolute gold," and

"modify the curriculum" to express their convictions about their own abilities in combination with the use of tables (see Appendix V). These results were also matched to responses from the administrator interviews, where two of the three administrator participants identified the teachers that used tables at the school as "skilled instructors that use a high level of questioning" in their activities. Secondly, a *demonstrative teaching style* was also seen as an indicator of teacher self-efficacy. Specifically, the language arts teacher was found to be confident in relation to discipline, academic success of students, and the continued use of tables as a viable classroom strategy. The classroom observations for this case reinforced these findings, where the teacher's demeanor was noted as "commanding" and "organized." The teacher from the math case also exhibited an extremely high level of self-efficacy in relation to teaching style in the classroom. This was indicated through actions, words, and a focus on learning, all documented through a combination of interview responses and classroom observations. The instructor's confidence was shown through capable and constant movement around the classroom and through strong classroom management. This instructor also demonstrated sureness by encouraging student success with comments like "okay, perfect, good job," "'Jane' is on it," "great job," "You're on the right track," and "thank you, much better." These affirmations were accompanied by a pat on the back, thumbs up, or fist bump. It was also twice noted in the participant observations for this case that the instructor was particularly conscious of and sensitive to low performing students. The math teacher also displayed substantial focus on student learning, indicated through a noted concern for "students," "learning," "assessments," and "exams." This was reinforced by a student who commented, "Table wise I think that maybe the teacher

wants you to get along with everybody else in the classroom. And wants you to be able to think for yourself but also share your information. They also want you to pass by learning from other people." Similar to the math instructor, the social studies teacher was found to have a high level of self-efficacy relative to teaching style. This was observed in three areas: (a) classroom management, (b) focus on academic performance, and (c) emphasis on interpersonal skills. The social studies instructor showed confidence in management ability with phrases like "I move around really well" and "I think accountability comes from the instructor." This self-assuredness was also documented in the classroom observations with notations like "command of the room," "speaks confidently," and "students comply without question." The social studies teacher was also found to have confidence in the decision to use tables with comments such as "It forces engagement" and "I would definitely say I use collaboration." Finally, self-efficacy was identified through this instructor's significant attention to enhancing the interpersonal skills of students with phrases like "connected," "interpersonal skills," "more personal," "social skills," "social benefits," "what kids are going through," and "coming together to help each other." This finding was reinforced with the teacher's accolades to students as noted in the classroom observations: "You guys did an amazing job," "I tip my hat to you," "I salute you," and "I affirm you." The last indicator noted as evidence of positive teacher self-efficacy across the cases was *self-reflection.* It was shown that the instructors in each case had given much thought to the decision to use tables and also to the effects of those decisions on their students. The language arts teacher discussed past experiences of teaching in a classroom with desks compared to using tables. This instructor also indicated that using tables required a lot of "trial and error" because no mainstream

strategies exist for using tables in high school. This was also seen through the math teacher's reflection concerning the use of tables, evidenced by the instructor's feedback: "I've had activities blow up in my face" and "It took me a while to adjust." The social studies teacher also expressed the need to "create new strategies" for a classroom with tables. Additionally, this instructor indicated that, like classrooms with desks, individual classes can have distinct temperaments which can require a teacher that uses tables to increase their "bag of tricks." All three teachers were shown to have a strong awareness of the unique strategies necessary for table use and the specific adjustments required of them.

The common negative theme noted as being associated with teacher self-efficacy was *lack of control*, a topic linked to two of the major themes previously discussed—*excessive socialization* and *cheating*. Throughout the interview process, the more prevalently noted of these was "socialization" (see Appendix V). These types of responses were compared to the responses from administrators, where two out of the three administrator participants identified the teachers at the site that used tables as "strong disciplinarians." This combination showed that the teachers in each case identified excessive talking as a potential problem in using tables, but also that they were dedicated to overcoming the issue. While the teachers somewhat questioned their own abilities, the administrators confirmed them, which denoted a difference between teacher efficacy and teacher self-efficacy. The other aspect of *lack of control* that emerged in relation to teacher self-efficacy was a questioning of ability in terms of addressing cheating on tests. The teachers from the language arts and math cases expressed this concern, but both also detailed the strategies they used to combat the problem. The social

studies teacher did not articulate concern about cheating on tests, which indicates the possible need for further study relative to this core subject. While the administrator participants collectively identified cheating on assessments as a significant problem with using tables in a classroom, they did not associate this issue at all with teacher efficacy.

Research Question Four

What are the possible community-building implications of using tables and chairs instead of traditional desks?

Because community-building has been found to impact achievement (Booker, 2008; Davis, et al., 2010; Yasuda, 2009), it was important to explore what role tables have in conjunction with this construct. This question led to a better understanding of how the use of tables affected students and teachers in terms of building a classroom community. All data from each source related to community-building was coded in blue in order to isolate specific responses to this construct.

The following sections provide findings specifically related to community-building. The interview responses from the participants in each case were drawn from student and teacher responses to all six interview questions from the interview protocols (see Appendices J and K). The perceptions of the classroom participants were used in conjunction with the administrator comments and the other five types of data to establish cross-case themes for this research question. Subject-specific themes are also discussed at the end of this chapter.

Cross-Case Themes Relative to Community-Building

Many positive common themes emerged in relation to community-building. They included (a) *family*, (b) *safety*, (c) *community/sense of belonging*, (d) *consideration for*

others, (e) *positive social climate*, (f) *academic engagement*, and (g) *real world*. All of these were corroborated through multiple participants and types of data across the cases.

Family. The first theme to emerge was *family*. The connection between using tables and family structure was an overriding theme documented through each type of participant. For example, the teachers in each case made reference to "family" in relation to using tables in their classrooms (see Appendix W). This ideal was found in their statements like "It feels like a family," "They feel at home," "Family-oriented atmosphere," and "It's like a family around a dinner table." This subject was also evidenced in a student's response, "It's like a family or really really close friend that you treat like your sister or brother." Additionally, the theme of "family" was reinforced by comments from administrators (see Appendix S) in reference to meal sharing, "It's like sitting down to dinner with your family" and "They have the same feeling as when they're in the lunch room with their buddies."

Safety. Another theme that was identified in relation to community-building, and likely an extension of the first, was *safety*. It was shown that some students felt safer at a table, although it was not clear in context if they meant emotionally or physically. However, it was documented in two of the language arts observations that some students chose to sit so close together that they were physically touching, albeit not due to a lack of space. Additionally, students in both the language arts and social studies cases stated that sitting at tables in class made them "feel safer." The social studies instructor also indicated that "students would probably feel better being at a group if there was a really tough situation happening in their lives." This theme was not evidenced through any data for the math case, indicating a need for further research as it relates to this subject.

Community/sense of belonging. The next theme to emerge in relation to community-building was *community/sense of belonging* which was also noted in the evidence from all three types of participants. Teacher interview responses included phrases like "sense of community," "community atmosphere," "little community among the bigger community," and "tables act like a unit." Two administrators indicated that students in table exclusive classrooms "don't feel left out" and experience a "sense of belonging," and another administrator stated, "It allows the students the opportunity to share that community feeling." Students from each case gave responses that supported the community ideal: "We help each other," "We work together," "You can depend on people," and "I feel comfortable with the people at my table" (see Appendix X). More specifically, students in the social studies case indicated that sitting at tables provided opportunities for interaction that made them feel more connected to their peers. This was evidenced through phrases in their responses like "people around you," "someone right beside you," "others at the table," and "you're around people." The math instructor was observed to reinforce the theme of community, particularly as a contributing member of the classroom community. This was noted in several behaviors exhibited by the teacher toward the students: (a) the use of humor, (b) sharing personal experiences, (c) sharing personal belongings, (d) asking favors, and (e) referring to the class as "we." Similar to the math teacher, the social studies instructor was included as a member of the classroom community. The teacher confirmed the students view, indicating that the use of tables encouraged students to "engage" more, leading to a "higher level of accountability" for students individually and as a community. The social studies instructor was also observed to reinforce the theme of community through several behaviors toward the students: (a)

the use of humor, (b) sharing personal experiences, (c) sharing personal belongings, (d) asking favors, and (e) referring to the class as "we" and "us." All of these specific behaviors were not observed by the language arts teacher; however, it was noted in the observations for all three cases that both students and teachers shared materials with each other, like pens, pencils, paper, notes, calculators, and books.

Consideration for others. Another theme that surfaced in relation to community-building was *consideration for others.* In addition to reaping the benefits of sitting at a table, the language arts students also recognized the responsibilities associated with it, as noted with the phrases "consider other people," "be considerate of others," "don't lay your head down," and "try not to get in their way." The social studies students were found to confirm this need to be considerate of others: "Cooperating with other people at your table is important." Additionally, "cooperation" and "cooperating" were words incorporated into positive statements by the social studies students. Unfortunately, this theme was also established through a lack of consideration for others in relation to table use. The social studies instructor reiterated the need for common consideration for others at a table: "…the kids that put their heads down at a table, they are a dead give-away." A lack of consideration for others was also noted as it related to the movement of chairs. In one language arts participant observation, the entire class of students left at the end of class without returning moved chairs to their proper places. It did not affect the students necessarily, but it did frustrate the teacher and likely the next class of students that would be forced to "clean up" after their predecessors. This issue was also raised by the math instructor: "…the chairs are gonna be in a different spot at the end of each class. They're gonna move them no matter how many times you tell them."

Positive social climate. An additional commonality found between all three cases in relation to community-building was the creation of a *positive social climate*. Teacher statements supported this idea: "There is more interaction," "Every kid puts a word or two in every day," and "It is a social ice breaker." Two of the three administrators indicated that table exclusive classrooms "promote a friendly social climate." Students across the three cases made the following statements related to social climate: "Kids can interact with each other," "I like interacting with the people at my table," "We interact more," and "I can sit with my friends." This finding was also noted in the direct observations for all three cases where students regularly socialized before class and in between academic tasks. Additionally, more specific behaviors contributed to the "positive social climate" for each case. In the language arts classroom, many students responded harmoniously with "bless you" when a classmate sneezed. In the math classroom, two students regularly shared one set of headphones. In the social studies class, several pairs of students shared headphones, and the instructor actually used social interaction, called "Off Task Time," as a reward that was calculated down to the minute.

Academic engagement. Another theme related to community-building that was found across the cases was *academic engagement*. The teachers stated, "They help one another," "The students teach each other," and "Students help each other." The administrators reiterated this premise with statements like "It fosters dialogue," and "They learn from each other." The students themselves identified tables as a source of academic engagement: "We ask each other questions," "Everyone has different strengths," and "You can work out problems together." These ideals were also evidenced through the behaviors of the students in the individual cases. In language arts, students

were seen to work in pairs even when not prompted to do so. One language arts student also stated, "A lot of times when you are working on brief assignments or free work, you can ask other people questions. Like when we are writing essays or something, you can ask people questions about grammar or the way a sentence is written. Yesterday when we were doing our essays, we were sitting at a table as a group and we would pass our papers along and have them peer edited, and we would ask each other questions about how to fix sentences to make them sound better. So I think it helps to sit at tables." Another language arts student said, "With groups, you also have other students that you can have intelligent conversation with." Students in the math case also worked in pairs or groups of three during each observation. Many of the pairs of math students shared one calculator. In one math observation, a student came in late after whole instruction, and two other students proceeded to teach the student the material that was missed. In the social studies case, partner assignments or team activities were used during each of the six observations. All of these examples support the idea that the use of tables promotes academic engagement.

Real world. The last theme that emerged relative to community-building was *real world*. The language arts instructor used phrases like "people in the real world" and "learning how to act socially, ethically, and morally" in connection with the types of activities and interactions experienced by students in the case. This indicated the teacher's view that using tables in a high school classroom functioned as a model for real world experiences. The social studies teacher confirmed that tables "teach you how to be reflective and how to listen, which is a tool needed in life." This was also reiterated by the students in the social studies case. They used phrases like "kinda like real life," "get

along in life," and "outside world" when referring to their experiences at tables. It should be noted that this theme was not evidenced in the math case. While a variety of lesser themes emerged that had a negative association toward the construct of community-building, none were noted across all three cases.

Research Question Five

What physical environmental dynamics are present in a classroom that utilizes tables and chairs instead of traditional desks?

Because physical learning environment has been found to impact achievement (Berg, et al., 2012; Wannarka & Ruhl, 2008), it was important to explore what role tables have in conjunction with this construct. This question led to a better understanding of the physical dynamics in a table exclusive classroom and the impact they have on both affective and psychomotor conditions of students and teachers. All data from each source related to environmental dynamics was coded in green in order to isolate specific findings for this construct.

The following sections provide findings specifically related to environmental dynamics. The interview responses from the participants in each case were drawn from student and teacher responses to all six interview questions from the interview protocols (see Appendices J and K). The perceptions of the classroom participants were used in conjunction with the administrator comments and the other five types of data to establish cross-case themes for this research question. Subject-specific themes are also discussed at the end of this chapter.

Cross-Case Themes Relative to Environmental Dynamics

Many cross-case themes emerged in relation to physical environmental dynamics in the table-exclusive classrooms. Several subjects were identified to positively impact functioning in the cases in terms of physical classroom structure. They included (a) *more space*, (b) *movement*, (c) *closer together*, (d) *strategic lesson planning*, and (e) *pleasing environment*. Two themes also emerged that were deemed detrimental to the classroom environment—*proximity* and *dysfunction of the furniture*.

More space. The first positive theme was *more space*. Students in all three cases indicated that receiving instruction at a table afforded them more space than traditional desk seating (see Appendix Y). The extra space was seen as a benefit for bodily comfort, as noted through comments like "I like being able to stretch my legs out," "It's not cramped," "It's not crowded," "It's more comfortable," "You can sit at different angles," "There is more leg room," and "You can sprawl out at a table." Students also acknowledged that they had more space for their belongings: "You can spread out your stuff," "You don't have to put your stuff on the floor," and "There is more space for your stuff." The additional room of the table top also allowed students more space to work, which was documented in these statements: "A table supports a big project better than a bunch of desks," "It lets us do group activities," "There is more space to work," and "You have more control of the space." This was particularly evident in an observation of the language arts class on a day when students were using laptops for writing workshop. The table tops provided ample space for all students to have computers and other papers on the table during the writing process. A similar observation was noted for the social studies class during a lesson that required the use of laptops. It was also shown that the

classrooms themselves had more space when tables were used instead of desks. Students stated, “It’s easier for the teacher to get around to help students,” “The room is less crowded,” “It’s more open,” “The room is not cramped,” and “There is more room for the teacher and students to walk around.” All three teachers corroborated this finding: “It’s easier to walk around tables,” “It’s easier to get around to students,” and “It is easier to move around tables” (see Appendix Z). An administrator also stated, “You have more room to adapt the classroom environment” (see Appendix S). This was also noted in observations of each case. For example, in the social studies class, the students had ample space to stand, sit, and move between tables during a class activity that involved a game. Likewise, it was observed in all the cases that students had plenty of space to maneuver between tables in order to gain access to classroom materials.

Movement. The second theme that emerged that reflected a positive impact on physical classroom dynamics was *movement*. It was found that it was a benefit to students to have more mobility while seated for instruction or during work. This movement was mostly due to the fact that the chair was not attached to the table the way that it would be to a traditional desk. They used words like “claustrophobic,” “cramped,” “confined,” and “trapped” when they described desk seating. Twelve of the twenty-two students interviewed said it was important that they could “move the chair” at a table. However, leaning back on the rear legs of chairs was noted as a problem in each case.

Closer together. The third commonality across the cases was the benefit of students being physically *closer together*. Fifty-nine percent of the students interviewed indicated, “You are closer together so you can work together more easily.” The teachers in all three classrooms substantiated this ideal with “Students face each other instead of

just the front of the class," "The classroom structure is more student centered," "Students are not isolated at tables," and "The students interact more because they are facing each other." Two administrators agreed with "The layout promotes discussion and collaboration instead of 'sit and get.'"

Strategic lesson planning. The fourth collective and advantageous theme associated with environmental dynamics was related to *strategic lesson planning*. This was documented through the teacher interview comments: "Students can work individually or in groups without moving furniture," "Tables provide a big work surface for projects," "If I'm speaking to one student at a table, technically I'm speaking to all the students at the table," and "Tables promote cooperation." Accordingly, the teacher lesson plans across all three cases relied on the physical aspects of the tables and their configuration in the classroom to accommodate specific activities. These included cooperative learning in pairs and small groups, the creation of large scale group projects, and the reorganization of students or tables as a strategy. For example, in the language arts case, one lesson required students in groups of six to each discuss and then teach an assigned segment of text. Groups did not have to be assigned, nor did any furniture have to be moved to begin the activity because the tables were already configured to accommodate the lesson. In other lessons, students in the language arts class were asked to create large group projects on the tables—collages, poetry flags, timelines, brainstorming boards, and historical maps (see Figure 12). Similar applications of table use were also identified in the math and social studies lesson plans. In many lessons, the math teacher assigned pairs or small groups of students to work out problems together and then teach other groups. In one activity, math students were asked to make large

reference charts for the classroom walls (see Figure 13). Similarly, the students in the social studies class participated in a lesson that required groups of three or four students to brainstorm on large paper, which was then used to create a "brainstorm wall" for the classroom (see Figure 14). It was found that all three teachers regularly used activities like these that involved grouping, student movement, and the creation of projects requiring a large flat work surface.

Pleasing environment. Additionally, students in all three cases described their table furnished classrooms as having a more *pleasing environment.* This theme was noted in the interview responses in the language arts case when students stated that they liked the "atmosphere it create[d]" and that it was "neater." Similarly, the math students indicated that the use of tables created a pleasing environment when they used phrases like "brighter environment," "doesn't look cluttered," and "more organized" to describe the aesthetics of the classroom. This finding was corroborated also through administrator comments: "The non-traditional layout is more inviting" and "It creates a positive environment." Additionally, this more relaxed environment was noted in the participant observations for each case, particularly in relation to the levels of movement and interaction between students throughout most of the class periods.

Proximity. In addition to the positive themes associated with physical environmental dynamics, two themes also emerged that were identified as detrimental. The first was *proximity*. In the same way that socialization was seen as a benefit and a drawback at the same time, so was the case with proximity of students to one another. The nature of students sitting so close together was good for goals such as collaboration and community-building; however, it also created problems like too much talking and the

Figure 12. Student Work Samples from Language Arts. Photograph by author.

Figure 13. Student-Made Teaching Tools in Math. Photograph by author.

Figure 14. Group Brainstorming Activity in Social Studies. Photograph by author.

ability to cheat more easily. Talking and cheating were also found to negatively impact the other three constructs. Specific to the table environment, several students stated, "It's easier for people to talk too much because they are close together" and "When someone is sitting close to you it is easier to cheat." Both of these were repeatedly reinforced as drawbacks by all three instructors. Specifically, the language arts instructor commented "Sometimes it limits though, separating certain students. I can only put them in so many spots," indicating that proximity was an issue for activities that purposefully required students to work apart. Additionally, all three administrators corroborated that cheating was a problem simply because at tables students sit close to one another. Another problem created by proximity is sharing space. While students generally enjoyed what they perceived to be more space, they also indicated that at times it was difficult to share the space physically. Student comments included, "You have to be careful not to bump or kick other people," "You don't get your own space," "Sometimes people shake the table or kick your feet," "Sometimes people crowd you," and "Sometimes people accidentally kick you under the table." While most students graciously accepted this minor hazard of sitting at a table, it was noted as a common concern across all three cases.

Dysfunction of the furniture. The second negative aspect found was *dysfunction of the furniture*. It was observed that the physical structure of the tables and chairs had the potential for adverse effects on both students and teachers. First, if the furniture was not maintained properly, it had an unfavorable effect on student comfort and attitude toward learning. This detriment was noted in the observations for the math case in relation to environmental dynamics. Several chairs were cracked in the seat area, which likely caused discomfort for students. Additionally, one student in the social studies case

indicated that learning at a table was difficult, specifically because the tables were "bumpy," which made the task of writing unpleasant. This problem was also documented in the observations of this case, where many students wrote on folders to avoid the bumpiness of the table.

Subject Specific Themes

Several themes emerged from the data that did not occur across the cases, but were instead specific to individual subject areas. Each of the themes was substantiated through multiple sources of data within the cases. They are presented for language arts, math, and then social studies.

Language Arts

Two themes were identified for the language arts case specifically—*teacher anxiety* and *positioning*. Both are significant in terms of classroom practices. The first theme indicates an important consideration for language arts teachers contemplating the use of tables instead of desks. The second provides useful information for instructors already operating table-exclusive classrooms.

Teacher anxiety. A subject specific theme that was found in the language arts case was *teacher anxiety*. While the data from administrator interviews, teacher interview, and classroom observations showed the language arts instructor to exhibit a strong sense of confidence in the classroom and in using tables, ironically these results were mirrored with the teacher's sense of "anxiety" over testing and space, which indicated a significantly negative impact on teacher self-efficacy. This finding was also documented in a participant observation on a day when a test was being administered. The teacher's anxiety was noted during a series of strategies used to prevent cheating on

a test: (a) collection of student cell phones, (b) construction paper to cover answers, (c) repeated verbal reminders to cover answers, (d) walking around room during test, (e) individual collection of tests by instructor, and (f) no talking permitted until all students finished. The challenge of testing effectively in a classroom with tables was significantly reinforced in the language arts case. The instructor confirmed this drawback: "Sometimes I feel anxious. I have a lot of anxiety about how am I going to space them for testing…I get anxious about testing." While the subject of cheating on tests was widely acknowledged across the data, anxiety was not documented as an effect in either of the other two cases.

Positioning. *Positioning* was also a significant theme found to be unique to the language arts case. Students pointed out that at times seat position at a table was a drawback to comfort and learning because it had the potential to make seeing the teacher or focal activities difficult. This was evidenced through student comments like "harder to see," "move your head a lot," "stagger your position," and "so you can see." This problem was documented in several of the classroom observations because the table layouts did not appropriately accommodate the lesson activities, making it difficult for some students to position themselves to see the front of the room. It was noted that some students picked up chairs and moved them, some attempted to turn around in their seats, and some even became disengaged during the lesson because they were not positioned properly.

Math

Three themes were identified for the math case only. They included (a) *not doing your own work*, (b) *intentional placement of students*, and (c) *people you don't like*. The

first two revealed logical connections to the subject matter, but the third seemed to create more questions than answers during the analysis of the data. Additional research related to the last theme would be highly beneficial to math instructors considering the use of tables.

Not doing your own work. One theme that emerged from the student participant interviews that was specific to the math classroom was *not doing your own work.* Cheating was related to this theme, as was noted in several other areas of the study, but specific to the math case only was the risk of "getting it wrong." While the math students liked the ability to get help from their classmates, they also pointed out that there are definite risks to receiving learning assistance from peers, primarily that accuracy is not always guaranteed. This occurrence was also noted in a participant observation, where a student repeatedly stated, "I don't know how to do this," even though the student next to her had been helping her for most of the class period.

Intentional placement of students. Another theme noted that was specific to the math case was the teacher's *intentional placement of students* according to ability levels. This was noted in the instructor's interview and corroborated in part by the math students' concern with peer assistance. This procedure was accepted as a standard practice in the math classroom, as observed and recorded in a participant observation for the case. While students could freely move to help each other between tables in the math class, their seats were for the most part assigned. The instructor also indicated that the seat assignments were changed periodically dependent upon the material presented and the level of student performance. This method was not evidenced in the other two cases.

People you don't like. Another theme only identified through the math case was *people you don't like.* Two aspects of this theme emerged through the student responses in the math class. Both were predominantly prefaced with "you HAVE to…," indicating that the students often saw sitting together as a challenge. The first adversity involved simply that—"sitting with people you don't like." This was expressed by several people in the class with phrases like "someone that you don't like," "aren't good at working with other people," "just better alone," "someone you don't get along with," "someone that you don't know," "not always with the same people," and "work with different people." The second challenge identified by the math students was an extension of the first—that it was also hard to "cooperate with people you don't like." They used expressions like "having to adapt," "have to share," and "have to work around it." These perceptions from students were clearly noticeable to the math instructor. While the teacher was a proponent of table use for the sense of community it enhanced, responses like "there are students that don't like working with other people" and "some students are uncomfortable" indicated that a small percentage of the math students really had an unfavorable reaction to learning in a classroom with tables. One administrator commented, "Some kids would rather be by themselves." This problem was not noted in any of the classroom observations for this case, nor identified in any of the data for the other two cases. Ironically, it was actually shown in the social studies case that students were trained by the instructor to positively address this specific issue. Comments from the social studies students referenced "students you don't know" and "cooperation," similar to those identified in the math case, but the experiences were viewed as opportunities instead of challenges. The social studies students used phrases like "know them better," "closer to

people that you might not know," "get to know them a little better," "get to know someone that you might not know," and "opportunity."

Social Studies

Only one theme was unique to the social studies case—*equality between students*. It is likely that this finding was significantly associated with the subject matter because equality is closely tied to many of the objectives outlined for the course. However, it was also substantially reflected through the demeanor of the instructor.

Equality between students. A subject specific theme that only surfaced in the social studies case was *equality between students.* This was shown through the instructor's stated distaste for the traditional hierarchical structure present in most classrooms that use desks: "Maybe that the traditional desk seating lends itself to separation of students not in a good way…like the smart kids sit in the front, the dumb kids sit in the back, etc…Tables get rid of that element totally, because everyone is mixed up together, which creates an even playing field." The instructor indicated that the physical structure of tables in general promotes equality among students instead of a "power struggle" as was perceived through traditional desk/row seating. This theme was closely related to many social studies content standards, which may explain why it was not evidenced in the other two cases. Ironically, within the case, it was shown that a lack of uniformity in student seating detracted from the equality that the instructor hoped to establish, which was found to be a drawback in attitude toward learning for students. Because the tables and chairs were not all the same in the social studies classroom, the competition expressed by the students for "good seats" and "newer tables" was shown to be a detriment to student equality. This problem was also documented as an issue in the

participant observations for the social studies case when several times the teacher had to assign seats because students competed for the "good seats." The teacher did express a desire to replace the classroom furniture with "really comfortable chairs and tables that matched."

Summary

The results of this study were established through a close examination of experiences in the three core classrooms that served as the cases. An elaborate combination of participants, data sources, and analytical techniques allowed for the creation of a thorough depiction of the affective and psychomotor effects of table use on students and teachers in these high school classrooms. Additionally, the five research questions proved useful in not only accommodating the variety of data collected, but also by providing more targeted avenues by which to identify themes and draw conclusions. A myriad of positive and negative themes emerged as a result of using constructs that were significant to both table use and empirical links to student achievement.

Like most other public high school classrooms, each of the three cases used in this study were found to have commonalities and distinctions in terms of how they operated. However, this research sought to identify findings that were specific to table use within the cases. In light of this, it was found that each of the three classrooms was notably different from classrooms that use traditional desks simply because they used tables instead. This was seen in the (a) daily procedures, (b) types of activities undertaken, (c) behaviors of the students and teachers, and (d) through the general atmosphere created in the classrooms. Each room felt unique from the others, mostly indicative of individual teaching styles, but they also shared a novel and somewhat exciting environment that was

easily witnessed by the participants. These distinctions were amply noted by administrators, teachers, and students alike.

In relation to table-exclusive classrooms, the general experiences of administrators, teachers, and students were predominantly favorable, allowing for the identification of many positive thematic findings. However, the participants also identified the drawbacks of using tables in high school classrooms, establishing a few universal negative themes worthy of special consideration. Several lesser themes were also identified as being relevant to the individual constructs, and subject-specific findings were also found for each of the cases. A discussion of implications, limitations, and recommendations for future research in relation to all of the findings is provided in Chapter Five.

CHAPTER FIVE: DISCUSSION

Public education in the United States has changed significantly over the past several decades. There are many reasons for this shift, but advances in technology and globalization have been the most influential. In an attempt to maintain, and in some cases regain, world standing in education, American legislators implemented the No Child Left Behind Act (NCLB) (2001). In addition to specific and stringent mandates for public schools, the law afforded states and districts the ability to educate children in new and non-traditional settings, like charter schools and virtual schools. While the intention of improving education and potential advancement globally was admirable, several issues stagnated the efficacy of NCLB. One of the biggest hurdles for educators was lack of funding. Hit by a recession just a handful of years after the enactment of NCLB, educators were left to figure out how to meet the highest expectations for learning and performance when given the least amount of money in decades. Consequently, the educational climate became ripe for innovation, not only to meet the standards of federal law, but more importantly to engage students in a way that would make them competitive on a global stage. Changes in conventional high school classroom practices in particular have become an integral part of getting kids ready for the new world.

This study explored a simple and cost effective classroom modification that might have implications toward student advancement—the use of tables and chairs instead of traditional desks in high school core classrooms other than science. The use of tables in elementary classrooms is a common practice (Bulunuz & Jarrett, 2010; Peterson & Davis, 2008), and colleges and universities have also transformed classrooms and lecture halls with modifications in seating, layout, and technological functionality (Ogilvie, 2008;

Taylor, 2009; Veltri et al., 2006). However, high schools have lagged behind in these types of innovation and real world practice. The use of traditional rows of desks continues to be a mainstay of public high school classroom instruction, most often attributed to standardized testing procedures, teacher preference, and lack of funding. The problem is that in most core subject classrooms, the use of desks has become restrictive to both students and teachers. Desks are physically uncomfortable for students (Douglas & Gifford, 2001; Khaspuri et al., 2007; Saarni et al., 2007) and provide little work space or opportunities for collaboration (Veltri et al., 2006; Wannarka & Ruhl, 2008) or a sense of community (Yasuda, 2009). The use of desks also hampers a teacher's ability to implement effective and authentic strategies, activities, and assessments that engage students on an emotional or physical level relevant to modern expectations. Classroom environments that utilize rows of desks also make it difficult for educators to incorporate many aspects of technology due to limited space.

Summary of the Findings

This exploratory (Yin, 2009) collective (Stake, 1995, 2006) case study was designed to investigate the effects of using tables in high school classrooms, especially through the eyes of students and teachers. While achievement remains at the forefront of educator goals for students, it was important through this research to first establish what effects the use of tables had on the affective and psychomotor experiences of students and teachers. Four propositional constructs were chosen as lenses through which to view the findings: (a) attitude, (b) self-efficacy, (c) community-building, and (d) environmental dynamics. These paradigms were specifically selected as focal points for the study because they were already empirically linked to achievement and because they provided a

comprehensive connection to table use in a classroom. Attitude was chosen in order to elicit the feelings and preferences of participants in relation to learning at a table. Self-efficacy was important to consider because it addressed how students and teachers viewed their own capabilities when tables were used instead of desks. Community-building was extremely important to examine because tables by their physical nature require students to sit in groups every day. Environmental dynamics were highly relevant as well because the use of tables automatically changes the layout of a classroom as a whole. In this regard, the researcher's prior knowledge of the use of tables in a high school classroom was invaluable to the study because it allowed for an astute awareness of current thinking and discourse about the topic (Yin, 2099, p. 161). This experience also helped the investigator to create an appropriately relative theoretical framework in which to purposefully situate the findings.

Three core classrooms—language arts, math, and social studies—were used as cases for the study. A science case was not included as this subject is traditionally known to use tables as a strategy for experimentation, and ample empirical research already exists that correlates this practice with science achievement (Apedoe et al., 2012; Ibraheem, 2011; Lazarowitz et al., 1988; Parveen & Batool, 2012; Watson, 1991). All three cases were housed within one site, which was significant in maintaining consistency across the cases in terms of data types and collection methodology. Participants included three administrators, three teachers, and 59 students. Triangulation was achieved through six data collection methods: (a) documentation, (b) archival records, (c) interviews, (d) direct observations, (e) participant observations, and (f) physical artifacts (Yin, 2009, Chapter 4). The data was then analyzed using five types of analysis: (a) pattern matching,

(b) explanation building, (c) time-series, (d) logic models, and (e) cross-case synthesis (Yin, 2009, Chapter 5). The findings were then reported in correlation with the general experiences of the participants and in relation to each of the four propositional constructs.

A multitude of themes emerged through an examination of the data. An analysis of the data collected from administrators and teachers revealed four overriding positive commonalities in relation to table use: (a) *collaboration*, (b) *community*, (c) *classroom management*, and (d) *instructional strategies*. Both types of educators viewed table-exclusive high school classrooms as venues where more modern teaching approaches took place. Additionally, they perceived the classroom environment to be conducive to a more pleasing and inclusive atmosphere. The positive themes elicited from students were more significantly linked to the propositional constructs: (a) *comfort* as a predominant theme in relation to attitude, (b) *help from others* for self-efficacy, (c) *acceptance* in relation to community-building, and (d) *increased space* relative to environmental dynamics. In addition to the positive themes associated with table use in high school classrooms, several negative experiences were commonly found. All three types of participants agreed that (a) *tables are not for everyone*, (b) *excessive socialization* was a drawback, and (c) *cheating* was much easier at a table.

Many cross-case themes were also established for the individual constructs. In relation to attitude toward learning, it was found that the teacher participants had a *strong commitment* to using tables and that students indicated a significant *preference for tables over desks*. However, *distractions* as an effect of table use were found to negatively impact these affective responses. For the construct of self-efficacy, *positive student self-efficacy* was a cross-case theme exhibited by the student participants. This was

determined through a variety of lesser themes: (a) *help from others*, (b) *not alone*, (c) *asking and answering questions*, (d) *discussion abilities*, and (e) *independence*. The instructor participants were also found to have a strong sense of *positive teacher self-efficacy*, where (a) *high level of confidence*, (b) *demonstrative teaching style*, and (c) *self-reflection* were all contributing factors. The only common negative theme noted across the cases in accordance with self-efficacy was found in relation to the teacher participants—a perceived *lack of control*. This finding was seen in conjunction with two of the major themes, *excessive socialization* and *cheating*. Akin to community-building, many themes were confirmed in all three cases: (a) *family*, (b) *safety*, (c) *community/sense of belonging*, (d) *consideration for others*, (e) *positive social climate*, (f) *academic engagement*, and (g) *real world*. Many positive cross-case themes were also identified for the construct of environmental dynamics: (a) *more space*, (b) *movement*, (c) *closer together*, (d) *strategic lesson planning*, and (e) *pleasing environment*. Two negative themes emerged for environment—*proximity* and *dysfunction of furniture*.

Several subject-specific themes were also found. For the language arts case, *teacher anxiety* and *positioning* were verified. In math, (a) *not doing your own work*, (b) *intentional placement of students*, and (c) *people you don't like* were the subject-specific themes confirmed. Only one theme was proven for the social studies case exclusively—*equality between students*. A discussion of all of these results follows, to include implications, limitations, recommendations for future research, and a conclusion.

Discussion

The five research questions that were chosen proved to be highly effective in guiding the study. The first addressed the general nature of the topic, which yielded

ample thematic data for universal consideration. The other four research questions specifically focused on the propositional constructs linked to achievement. They were intentionally created to address both affective and psychomotor responses in the participants. Affective response typically involves attitudes, motivation, and values (Miller, 2005). Psychomotor responses involve physical movement (Bloom, 1956), which can also be expanded into the sensorimotor domain, to include the five senses along with balance, spatial relationships, movement, and other physical activity (Dettmer, 2006). The results garnered through these targets helped to isolate findings pertinent to the individual participants, cognitively linked constructs, and subject areas. Overall, the affective and psychomotor responses were significantly affected by the use of tables. Eleven themes were established for the general experiences of the participants; 20 cross-case themes were found in relation to the constructs; six subject-specific themes were discovered for the individual cases. Implications for the results associated with each research question are addressed. Rival explanations are also presented for each construct.

Research Question One

The first research question asked, "What are the experiences of high school students and teachers when tables and chairs are used in a classroom instead of traditional desks?" Overall, the students, teachers, and administrators had favorable experiences in relation to the use of tables in high school classrooms. Administrators and teachers were found to be particularly compatible in their views concerning table exclusive classrooms. Both identified (a) *collaboration*, (b) *community*, (c) *classroom management*, and (d) *instructional strategies* as benefits, all of which are educational ideals for any classroom. For the administrators, these themes were described as factors that they assumed were

being carried out within the classrooms using tables, but it was shown that they had few first-hand experiences in these rooms. This suggested a strong sense of trust between administration and the instructors, a necessary component for considering the switch to tables. For the teachers, the themes that emerged were based in large part on their own preferences, aspirations, and self-reflection. While the instructors from the cases used tables exclusively in their classrooms, they each had a different justification for using tables and a different way of using them on a daily basis. The lack of uniformity of table use between the teachers suggests that some of the results from the study would have been duplicated for these instructors even if they were in classrooms with desks. The students, however, expressed their experiences in table exclusive classrooms as being significantly different from rooms with desks. This indicated that potential differences in learning may exist between these two types of classrooms, at least for students. Overall, the students were also predominantly aligned in their preference for tables in accordance with the four constructs.

The predominant findings related to students' attitudes when receiving instruction at tables involved their *comfort* levels, both emotionally and physically. This was not surprising, given that adolescents place great emphasis on peer relations (Huang, 2010) and physical comfort at school (Douglas & Gifford, 2001; Khaspuri et al., 2007; Saarni et al., 2007). During interviews, the majority of students stated that they preferred tables, but they also indicated that it was awkward at the beginning. This discomfort was somewhat alleviated for students that had friends in class to sit with (Englehart, 2011). However, Gest and Rodkin (2011) found that seats assigned by a teacher, either to promote friendships or to prevent behavior problems, had an unexpectedly negative effect

on classroom dynamics. In contrast, Reilly and Mitchell (2010) determined that when left to select their own seats for cooperative tasks, low-track students experienced greater feelings of alienation, lower self-esteem, and a reduced willingness to work with their peers. This was somewhat substantiated in the math case where the instructor intentionally assigned seats according to ability levels. Consequently, the decision to assign seats or to let students select their own seats should be a consideration, at least during the onset of the term. This adjustment period is important in establishing the procedures and environment that is foreign to most high school students. In terms of affective response, student comfort levels tended to increase over time as students became more adjusted to their surroundings and the others sitting with them. This result has significant implications for teacher decision-making in terms of what specific types of activities an instructor might use in the classroom. Timing could also be considered pertinent, whereas some partner or group activities may be more successful if developed with students slowly over the course of the term. It was determined that after the adjustment period, students expressed a definitive preference for tables over desks, in part for the "fun" activities involved. An instructor looking to use tables would benefit from "easing" into the group format with ice breakers and simple strategies that foster collective performance. In relation to psychomotor response, student comfort levels were significantly greater when tables were used. More space and the ability to move more freely were definite benefits to using tables with older children.

Students also revered tables because they afforded them the ability to automatically *get help from others* whenever needed. This was an important contributing factor in relation to student self-efficacy. Part of this benefit was designed as an

intentional strategy used by the teachers, but it was also discovered to be a natural byproduct of students sitting close to one another on a regular basis. This was a finding that was corroborated across cases and from a wide range of students with different ability levels. The language arts honors students appreciated assistance from their peers when writing; the remedial math students relied on help from their classmates to solve problems; and the standard level social studies students enjoyed the convenience of sharing instructional tools and checking their work with others. Tables provided students with the resource of each other on a daily basis and without prompting from the instructor. The implications of this are twofold—one, student engagement and performance can be ongoing if the teacher is occupied, and two, the exchange of ideas between students will likely contribute to some reinforcement of content. However, a few students did express that receiving help from others involved a certain amount of risk, supporting the idea that not everything modeled should automatically be accepted (Bandura, 1977, p. 54). This idea reinforces the need for instructors to closely monitor student interaction when tables are used.

It was also shown in all three cases that students felt a stronger sense of *acceptance* from their peers in table-exclusive classrooms. As stated earlier, students in general were somewhat uneasy about sitting together at first, but actually grew to prefer it over time. In examining their affective responses in relation to community-building, the students indicated a sense of belonging that seemed to stem from the simple act of being part of a "unit" that was the table setting. For teenagers, fitting in and gaining the approval of their peers are integral parts of feeling accepted. Throughout the study, the data supported the idea that students viewed themselves as belonging to a smaller

community within the classroom, one that was merely established through group seating. They expressed feelings of not being alone and that making friends was easier when sitting at a table. This has profound implications for student well-being, particularly at a time when so many students seem to be suffering from mental illness, feelings of exclusion, and family structures that are broken.

Students were also overwhelmingly in favor of the additional space afforded by tables. O'Hare (1998) suggested that classrooms should include certain furniture or processes that accommodate group interaction, to include physical space for comfort, work space for materials, and seating that is conducive to clusters of students. In relation to sitting at tables, students liked *more space* for themselves, their belongings, and their school work. This is significant in that it suggests that tables are an appropriate vehicle in not only accommodating the physical size of high school students, but also the larger books, binders, and supplies they carry from class to class. Student participants definitively stated that they preferred to put their "stuff" on the table instead of on the floor as is often the case with desks. Having extra space was also found to be a benefit because large projects could be created in the classroom without students having to work on the floor or go to an outside hallway. The effect of this for a teacher becomes a controlled environment where all students can be monitored and assisted when necessary, as well as being able to encourage the creation of large, purposeful projects. While desks can be pushed together to mimic a larger work area, too often they do not line up flush, and students are forced to work around the "cracks." This method also requires time and organizational effort to set up the desks, which detracts from a lesson.

While the affective and psychomotor experiences of the participants were generally positive, collectively they also identified three negative themes associated with table-exclusive classrooms. The first was simply that *tables are not for everyone*. For the most part, the decision regarding whether or not to use tables instead of desks was found to be based primarily on teacher preference. One teacher chose to use tables to accommodate student physical comfort and furniture flexibility. Another placed great emphasis on collaboration as a strategy. The third decided to use tables to enhance student social skills. Administrators did not question the motives of the teachers because the instructors had already proven their adeptness in classrooms with desks, and each exhibited strong classroom management styles and a penchant for performance strategies. The teachers in each of the cases had clear-cut reasoning behind their decisions to use tables instead of desks in their high school classrooms, most of which focused on bringing students together. Consequently, instructors that rely heavily on a teacher-centered approach would likely not serve students well by using tables. Additionally, teachers with little experience or weak classroom management skills would find tables extremely challenging because of the likelihood of extra talking and student movement. It was also found that using tables instead of desks may not be suitable to every subject. Students gave several different responses in relation to this: "Tables are better for social studies and English," "Desks are better for Spanish and English," "I would not like a table in math," "Desks are better for math and science," and "Tables are better for all classes." It is reasonable to conclude that the combination of teacher and activities has more to do with the effective use of tables in a core subject classroom; however, these conflicting views certainly suggest a need for additional research on this topic for

individual disciplines. Another commonly acknowledged drawback to tables was their propensity to promote *excessive socialization*. Beavers (2011) found that while students tended to remain on task during group work, the type and quality of talk varied. Similarly, the teacher and student participants in this study identified "too much talking" as a periodic detriment to the effective functioning of the classroom. If students profess a disdain for something that gets in the way of instruction, then it is clearly a problem. Again, instructors need to self-reflect on their teaching styles and classroom management abilities prior to the implementation of tables for their classes. It would also be prudent to consider the student populations that one is likely to encounter, even for years to come. Certain groups of students may have specific needs that would not be appropriately met in a table-exclusive classroom. Most high school students exhibit a certain level of maturity that is conducive to group work, but exceptions surely exist. The last universally recognized downside to using tables was *cheating*. All the participants in the study agreed that it was easier to cheat when sitting at a table. This has profound implications in an educational setting where assessments are a regular practice. Teachers that use standardized testing frequently would not benefit from table-exclusive classrooms. Likewise, instructors whose rooms are often utilized for state and national testing would present a myriad of issues for administrators on test days. Additional moderate areas of concern related to the use of tables arose throughout the study and are discussed in more depth in the following sections for research questions two through five.

Research Question Two

The second research question that was used to guide the study was "How does the use of tables and chairs instead of traditional desks affect student and teacher attitudes

toward the educational process?" It was found that student and teacher attitudes in all three cases were positively influenced through the use of tables as evidenced by three lesser themes. First, the teachers from each case exhibited a *strong commitment* to the use of tables. It was noted that, like the students, they also became more comfortable teaching with tables over time. This was likely due to a period of trial and error, a concept that seasoned instructors are familiar with when implementing any new strategy or activity (Bandura, 1977). The teachers in the study were already adept as using a variety of instructional strategies, so the transition to tables was an effective change for them. The instructors were specifically passionate about continuing to use tables as long as it was an option for them. Even in light of drawbacks like "too much talking" and "cheating," the teacher participants were overwhelmingly optimistic that the benefits for students outweighed any drawbacks. Ironically, none of the teachers had any empirical evidence to support their claims, making this research viable. Secondly, students also indicated a significant dedication to sitting at a table in class. It is likely that the teachers had a key role in influencing the development of these student attitudes (Sarwar et al., 2010). More than 86% of the student participants confirmed their *preference for tables over desks* for at least some of their classes. Students were especially positive when discussing the types of activities they experienced in a class with tables: "We do activities instead of busy work," "It's not boring," and "It's more fun." When the teachers used instructional strategies tailored to the tables, student attitudes were positively affected. Meyer et al. (2009) also found that the use of specific instructional strategies positively affected student attitude. This level of student satisfaction was similarly found in relation to demanding instructional strategies (Adkins-Coleman, 2010), with open-ended

instructional activities (Harlow et al., 2011) and with the use of fun activities in science (Keiler, 2011). In this study, the combination of tables and engaging activities was observed to have a significantly positive affective reaction in students and teachers alike. Instructors that already use these types of activities successfully in classrooms with desks should be encouraged to try tables.

The last minor theme established in relation to attitude toward learning was *distractions*. Even though teachers and students had a preference for tables, it was evidenced that student and teacher attitudes were ill-effected by what was repeatedly referred to as "distractions." Not surprisingly, this aspect bled throughout the data collection process and consequently should hold much weight in the decision to use tables. In relation to attitude, distractions were identified as talking and noise that was bothersome to students and teachers alike. While students enjoyed the camaraderie and fun activities of tables, they did not like the excessive socializing that often accompanied it. Surprisingly, a definitive lack of serious discipline issues was noted across the cases. Teacher participants relished this fact and were deemed capable classroom managers by their administrators, but the annoyance of social chatter was a concern yielded by all three instructors. This reinforces the premise that not all teachers would enjoy using tables in their classrooms, if for no other reason than it simply enhances the potential for social exchanges.

Research Question Three

The third research question asked, "How does the use of tables and chairs instead of traditional desks affect student and teacher performance self-efficacy?" Bandura (1986) found that four factors contribute to a child's sense of self-efficacy: (a) past

performance accomplishments, (b) exposure to and identification with efficacious models, (c) access to verbal persuasion and support from others, and (d) experience of emotional or physiological arousal in the context of task performance. These aspects were also found to be contributing factors in this study, where student self-efficacy was noted as being positively influenced by *help from others* and *not* [being] *alone*. Adolescents who feel valued and respected by their classmates are known to exhibit increased self-efficacy (Nelson & DeBacker, 2008). Alivernini and Lucidi (2011) also found that students who perceived their social context as supportive had higher perceived competence and self-regulation, measured in terms of academic self-efficacy. These ideals were reinforced in this study and documented as a direct result of table use. Additionally, as previously mentioned, the students affinity for fun activities also increased their skills in *asking and answering questions* as well as their *discussion abilities*. These findings also bolster a significant link between using tables and student self-efficacy. An additional theme that emerged for students in the study was *independence*. Students' belief in their own abilities and power to self-regulate has been found to influence scholastic achievement (Bandura et al., 1996). For this research, this finding was more evident toward the end of the school year, seemingly a cumulative result of the impact of the other four, mirroring Bandura's (1986) conclusion concerning past accomplishments. It is somewhat ironic that working together helped to promote individual skill and independence in students, but this effect was definitively attributed to the specific dynamics associated with group learning at a table. The successful accomplishments of different students tended to increase the self-efficacy of individual students (Bandura, 1977, p. 82).

Teacher self-efficacy was also an integral component in examining the effects of tables in a classroom. When teachers are confident and expect their students to do well, they interact with them in ways that lead to their expectations being fulfilled (Rubie-Davies et al., 2010). This type of self-concept in teachers can also influence the self-efficacy of students (Corkett et al., 2011; Hardre & Sullivan, 2009). Additionally, an instructor's ability and competence in teaching can play a key role in promoting student self-efficacy (Bagakas, 2010). When using tables, *positive teacher self-efficacy* was found in the language arts, math, and social studies cases. The attributes that contributed to this theme were (a) *high level of confidence*, (b) *demonstrative teaching style*, and (c) *self-reflection*. This suggests that teachers who successfully use tables in high school classrooms have a sense of confidence going in, strong abilities in classroom management, and the ability and willingness to self-reflect. This depiction was reinforced through an administrator's view: "I knew that if they were confident enough to ask for them, they would use them to the benefit of our students." While teacher self-efficacy was high overall, it was not clear if the use of tables had significant impact on this construct or if the reverse was true. A teacher's past achievements can foster a sense of confidence that leads to the creation of opportunities that afford success (Bagakas, 2011; Caprara et al., 2006). Conversely, it was shown that teacher self-efficacy was negatively impacted by the instructors' concern for a possible *lack of control*, specifically in relation to *excessive socialization* and *cheating*. This was found to be a problem overall, clearly indicating that the ease in which students can talk and cheat at tables is a definitive byproduct of the structure itself. These findings confirm that teachers considering the use of tables need a strong sense of buy-in and sufficient experience in classroom

management. The third attribute, *self-reflection*, was significant in that it signaled the common level of experience needed to successfully run a table-exclusive classroom. This ability to self-regulate (Bandura, 1977), showed that the teachers in each of the three cases were "seasoned," a popular term used to portray effective instructors with ample experience. These types of teachers continually identify what works and what does not, a necessary process in conjunction with using tables in a high school classroom.

Research Question Four

Research question four was particularly effective in guiding this study: "What are the possible community-building implications of using tables and chairs instead of traditional desks?" Within each of the bounded systems, tables were shown to be functional communities (Yasuda, 2009) situated within the larger classroom communities. Additionally, Psychological Sense of Community (PSOC) was significant for each case, where interdependence and membership to the larger dependable and stable structure were both observed (Sarason, 1974). This "sense of community" has substantial implications for achievement (Lee et al., 2011; Wighting et al., 2011), although a definitive link is still debated by many researchers (Booker, 2007; DiCamillo & Pace, 2010; Kumnuanta, 2011; Skudrzyk et al., 2009). Related to community-building, Ediger (2009) found that cooperative learning, like that promoted within this study through the use of tables, was one of the seven criteria necessary for an effective classroom, suggesting that it improves engagement, politeness, and consideration for others. The themes of *acceptance* and *consideration for others* signified that tables indeed created mini communities within the surrounding community that was the classroom as a whole, where students became integral members of a group with common

interests (Bandura, 1977) and respect for one another. Taken a step further, it was also shown that these smaller communities had a significant impact on the affective responses of students. It has been shown that peers have a significant impact on a student's sense of community (Beck, 2009; Booker, 2008). Overwhelmingly, participants experienced a *sense of belonging* within the table communities, often referring to the creation of a *family*. Teachers tended to also include themselves as members of the community by using "we" and "us" to describe functions within the classroom. This "we feeling" was developed for both students and teachers through common sharing, communication, and the community itself (Dewey, 1916/2011). Another emotional benefit to being a member of a table community was the sense of *safety* that it provided (McMillan, 1996). Students expressed both an emotional and physical sense of feeling safe because they were sitting in a group with other students. These favorable conditions for students and teachers alike are strong motivators in the consideration to use tables in a high school classroom.

The table community was also found to have outward implications for students, where themes such as *positive social climate*, *academic engagement*, and *real world* surfaced as indicators that using tables contributes to an atmosphere that is transferable to conditions outside of the classroom. Beavers (2011) found that students enjoy the social and motivational aspects of cooperative learning methods in general. May and Doob (1937) established that when working in cooperation, people were more successful in reaching a common goal. This type of interaction created by the cooperative structure of tables tended to create a positive interdependence between its participants (Kagan, 1994; Slavin, 1990). These seemingly positive themes were also at times ironically tainted with negative ones like *sitting by someone you don't like* and *having to work with someone*

you don't like. These findings imply that a duality exists in relation to the social structure of a table that is comparable to larger structures such as the workplace or society in general (Powell & Lines, 2010). It is certain that sitting at a table will not guarantee that all students will suddenly adore one another, but both students and teachers do prefer seating that allows for this type of interaction (Douglas & Gifford, 2001; Veltri et al., 2006). It was also notable through each of the teacher participants that an emphasis on this type of *real world* interaction between students was a viable way to socially prepare students for post-secondary experiences. Learning that incorporates these ideals often includes movement and trial and error (Dewey, 1916/2011, p. 176), which might require significant classroom changes for some instructors. Ultimately, community-building was found to be the most obvious and significant effect of using tables. Teachers that are interested in creating this type of working atmosphere in their classrooms would substantially benefit from a table-exclusive setting. However, it should also be noted that as a result of the classroom observations, questions arose concerning student body language, gender, and peer group affiliation. These may have significant influence on the functioning of a group and should be considerations for further study.

Research Question Five

The last research question that guided the study was "What physical environmental dynamics are present in a classroom that utilizes tables and chairs instead of traditional desks?" In a school, a classroom becomes an environment where a reciprocal relationship exists between students and their surroundings (Bandura, 1977; Dewey 1916/2011). A change in this environment, like using tables instead of desks, certainly has implications on the emotional and physical responses of students and

teachers. Affectively, the use of tables was found to create a *pleasing environment*, one that was perceived by students as "neater," "more relaxed," and "more organized." An important goal in designing a classroom is to create a space that students and teachers like (Douglas & Gifford, 2001, p. 296). Accordingly, the students receiving instruction in table-exclusive classrooms seemed drawn to the aesthetics of the environment in a way that made them more receptive to learning. This attraction could be for the functionality of a room with tables, but it could also simply be a reaction to something new and different. The teacher in one case felt that the use of tables created "equality" for students by eliminating the linear hierarchy of traditional rows of desks. The configurative dynamics of the tables allowed individual participation from within a mix of students instead of from the front or back of the room. In this way, using tables eliminated the traditional stereotypes of "the smart kid in the front" and "the dumb kid in the back." Because seating arrangements have an impact on students and their participation levels in a classroom (Fernandes & Huang, 2012), this "equality" becomes an important aspect when considering the use of tables.

Classroom environmental dynamics were found to be most affected by the physical structure of the tables and what they could afford students. Gibson (1979) identified these *affordances* of a surface in the environment according to what they offer, provide, or furnish. For the student participants in this study, the use of tables afforded *more space*, *more movement*, and an opportunity for them to be physically *closer together*. Research indicates that open space has a positive effect on student perceptions of the classroom environment (Taylor, 2009; Veltri et al., 2006). The additional space and the ability to move more freely provided students with a comfortable and functional

work environment, one that they had more control over. Similarly, Hargis and Schroeder (2010) found that movable chairs and roominess in a college classroom allowed professors to get around better, which improved their interactions with students. These behaviors were noted for the instructors in the math and social studies cases specifically. Gibson (1979) found that the ability for one to lift and carry an object affords a variety of possibilities. This type of behavior was noted specifically in the students' opportunity to move the chairs. Also, the capability of students to work in closer proximity of one another provided them *mutual affordances* (Gibson, 1979), which in this research was shown to consist mostly of the ability to help each other with learning tasks. In this regard, the use of tables was shown to strengthen cooperation between students and the level of engagement in cooperative activities, both of which have positive implications in a high school classroom. The teachers in all three cases were also afforded *strategic lesson planning* options because of the tables. One benefit was that the tables automatically grouped students for cooperative activities. Another plus was that the surfaces of the tables furnished a large flat work space to accommodate materials for project work. Additionally, the ability to move the tables into a myriad of configurations to specifically adapt seating to lessons afforded a more tailored learning environment for students. The variety of layouts afforded different behaviors from students (Gibson, 1979), allowing for a breadth of experiences that would otherwise be challenging in a room with rows of desks. As stated earlier, tables are a great option for instructors who rely heavily on cooperative learning or project activities.

In some ways, the classroom environment was adversely affected by the use of tables. This was evidenced through two themes. The first concerned problems related to

proximity. Several issues emerged related to a lack of distance between students. *Excessive socialization* was found to be a drawback of using tables. Because students sit closer to one another at a table than they would at individual desks, talking is just easier to do. When the talking does not pertain to classroom activities, it can be counterproductive to the learner and distracting to others (Beavers, 2011). *Cheating* was also overwhelmingly noted by all participants and should be a serious consideration. Table use is definitely not conducive to traditional assessment practices like standardized testing. *Sharing space* was also found to pose potential difficulties for students. While most participants agreed that students went out of their way to accommodate one another, figuring out personal and work space was a common topic that emerged in relation to environmental dynamics and is worthy of attention. The second area of concern in relation to the classroom environment involved the physical characteristics of the furniture itself. *Dysfunction of the furniture* was an issue for students; they pointed out that "bumpy" tables were difficult to write on and some seats were uncomfortable to sit in. The teachers agreed that quality, uniform tables and chairs would alleviate physical discomfort for students, but also any need to compete for seat selection. Students definitely prefer rooms that have comfortable seating (Douglas & Gifford, 2001; Kahaspuri et al., 2007; Saarni et al., 2007). Kennedy (2006) suggested that the use of appropriate tables and chairs in a classroom could actually improve the educational environment and help students maintain focus. Another problem with the physical structure of the chairs, specifically, was the affordance of being able to lean back in them. This safety concern is not an issue with traditional desks where the seat is attached. While cost will certainly be a factor in the selection of classroom furnishings, educators should

take into account these physical aspects of how the furniture affects students. The last matter to emerge involved the positioning of tables and students which was also found to negatively impact the classroom environment. Fernandes and Huang (2012) suggested that students should choose a seat that is comfortable and provides a beneficial position to enhance their learning experience. This recommendation was relevant to table use because several observations within the language arts case revealed that at times students had a difficult time seeing during direct instruction due to the *positioning* of their seats. The layout of tables and placement of students is important for engagement, but it is also relative to student affective comfort. A seating arrangement can invoke feelings of unease in students if it does not accommodate their needs (Burgess & Kaya, 2007). In considering the use of tables, teachers must take on the additional responsibility of either selecting a seating plan that works on a daily basis or making the commitment to move the furniture frequently to complement specific lessons. Otherwise, switching to table use becomes no more effective than relying on standard rows of desks, found to be the least favorable condition to on-task behavior (Rosenfield et al., 1985). Overall, the use of tables was found to significantly impact the interaction between the environment and the students, causing both physical and psychical reactions (Bandura, 1977; Dewey, 1916/2011; Gibson, 1979).

Limitations

There are several limitations to this research. First, the findings are restricted by the type of site used in the study. Only one high school was used to collect data, which limits the transferability of the results. The suburban school has a small population with a relatively low number of discipline issues and high rates of student achievement. This

combination likely also reduces transferability to larger high schools set in an urban environment. Additionally, the site is located in the southeastern United States, so some of the results may have different implications in other parts of the country.

Some aspects of this study's methodology also contributed to the limitation of the results. First, participants had to rely on memory because interviews were conducted at the end of the school year. This may have reduced specificity or accuracy of the data collected. Additionally, the research relied on a small number of participants through which to collect data. A larger sample of students, teachers, and administrators would help to strengthen the transferability of the findings. Triangulation was achieved by using three cases and provided solid general findings for high school classrooms, but because each class was a different subject area, the transference of results was limited for the individual disciplines. While the number of cases and participants was manageable, utilizing four propositional constructs was challenging. In many instances, it became difficult to definitively assign data to a specific construct, and a significant amount of overlap occurred. This reinforced the findings themselves but made linking to effect problematic. For example, did the "bumpy" surface of the table have more of an impact on a student's attitude or on the physical environmental dynamics of the classroom? Did "preference to be alone" have more to do with student self-efficacy or community-building? The exploratory nature of the study was effective in bringing concepts to light, but additional research is warranted that targets the individual constructs.

My employment at the site was also a possible limitation to the study. While it did provide me more efficient access to the site and sample, it also allowed for potential bias. Yin (2009) suggests that a researcher rely on prior, expert knowledge in order to ensure

high quality analysis (p. 161). In this regard, my position at the school was invaluable in conducting an organized study and avoiding pitfalls. However, my role as a teacher at the site may have had an influence on the participation or interview responses of students and teachers. Bracketing out (Merriam, 1988) my own experiences with tables during the interviews, avoiding my own students as participants, and the use of critical colleagues (Yin, 2009) helped to lessen this potential for bias.

Recommendations for Future Research

This research was useful in establishing definitive connections between the use of tables and the constructs linked with achievement, therefore providing a foundation upon which educators can make informed decisions about using tables and chairs instead of desks in high school core classrooms. However, there are several recommendations for future research that would embolden the findings. First, a replication of this study on a larger scale using a variety of high schools and an increased sample size would help to establish more transferable results. Additionally, the collection of data throughout the course of a school year instead of collectively at the culmination of the year might help to improve the accuracy of the data, especially during interviews. It is also recommended that follow up studies use fewer variables through which to garner results. Examining one construct at a time in relation to tables would be useful for future qualitative designs by eliminating the crossover of data in more than one effect area. Quantitative designs would need to place great emphasis on controlling for the constructs used in this study, particularly if testing for links between tables and achievement. This would also be true in order to investigate connections between subject area or teaching style in correlation

with tables and achievement. For instance, limiting the cases to only math would produce more specific results for instructors interested in using tables in math.

As an exploratory (Yin, 2009) case study, this research also yielded several interesting questions that have potential for future investigations. For example, can the same sense of community established in this study be replicated in a classroom using permanent groups of desks instead of tables? Or, what factors help to diminish discipline issues when tables are used instead of desks in high school classrooms? How might gender play a role in the emotional or physical dynamics of a table community? What effect does peer group affiliation have on the table community? While this study certainly gave insight into the use of tables in high school core classrooms, it also opened the door for an extensive line of additional research.

Conclusion

The purpose of this study was to explore the use of tables in core high school classrooms in relation to several constructs linked with achievement. It was important to discover what role tables might have in connection with various aspects related to student cognitive achievement. The findings were significant in that they provided pertinent and specific information for educators who are already using or are considering the use of tables in their high school classrooms. The decision about whether or not to implement the use of tables is one that should be given ample deliberation. Administrators and teachers should spend a great deal of time discussing the goals for both teachers and students in this consideration. These conversations should delve into many factors associated with table exclusive classrooms.

First, instructors should be encouraged to self-reflect on their teaching strengths and weaknesses. Through this research, it was found that the social environment became definitively heightened when tables were used. Teachers with weak classroom management abilities should be reticent to use tables in their classrooms. Additionally, it was shown that the teachers in the study experienced high levels of success in relation to student engagement, due in large part to the types of strategies they used. Instructors that rely on traditional teaching methods like lecture and standardized assessment practices would likely not benefit from using tables in place of desks. Standardized testing procedures were found to be generally challenging for the table environment.

It is also imperative for educators to closely examine the needs of their students when considering the use of tables. It was found that the use of tables enhanced opportunities for discussion and group interaction, but that these same prospects also gave way to potential problems like too much talking and decreased individualized instruction for struggling learners. Educators should take into account the behavioral tendencies and academic ability levels of students before using tables. Once the decision to use tables is made, it is also suggested that students' physical needs be a consideration in the selection of furnishings. Tables and chairs should be durable, comfortable, and conducive to the specific activities that they will accommodate.

While this study discovered links between the use of tables in high school classrooms and the constructs associated with cognitive development, it also uncovered a multitude of areas worthy of additional research. Hopefully, this case study will serve as a foundation upon which future studies involving the use of tables in high school classrooms can be built.

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APPENDICES

Appendix A: Consent form for Child Participants

CONSENT FORM
Child Participants

Title of the Study
Teaching with Tables: A Case Study Investigating Affective and Psychomotor Responses in Students and Teachers

Researcher
Johanna Herndon
Liberty University
Department of Education

Your child is invited to be in a research study involving the use of tables instead of desks in core content classrooms. Your child was selected as a possible participant because he/she is a student that receives instruction in a classroom with tables. I ask that you read this form and ask any questions you may have before agreeing to your child's participation in the study.

This study is being conducted by Johanna Herndon, Department of Education.

Background Information:

The purpose of this study is to explore the emotional and physical experiences of students and teachers in classrooms where tables are used exclusively in place of traditional desks. This research will specifically address the role that tables may have in relation to student attitudes, student and teacher confidence, aspects of community-building, and classroom dynamics, which all have connections to achievement.

Procedures:

If you agree to allow your child to participate in this study, he/she may be asked to do the following things:

(a) Participate in three direct 50-minute classroom observations by the researcher,
(b) Participate in three videotaped 50-minute classroom observations,
(c) Possibly participate in a 30-minute audio-recorded one-on-one interview with the researcher, and
(d) Allow for an examination of his/her classroom work samples.

Risks and Benefits of Being in the Study:

The risks of participating in this study are minimal. However, because your child may share personal experiences, there is the risk that he/she may remember something unpleasant. You should also know that any information given to the researcher that indicates child abuse, child neglect, elder abuse, or intent to harm self or others requires

mandatory reporting to the appropriate authorities. Your child can decide to withdraw from the study at any time if he/she feels uncomfortable with his/her participation.

There are significant benefits of participating in this study. Your child will help to provide important information that may improve the quality of classroom experiences for other students and teachers. This information will also help to establish a line of research involving the use of tables in high school classrooms.

Compensation:

Neither you nor your child will receive compensation for participation in this study.

Confidentiality:

The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a participant or the study site. Research data and records will be stored securely, and only I will have access to them. All data and records will be destroyed three years after the study is completed.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to allow your child to participate will not affect any current or future relations with Liberty University, District "omitted," or High School "omitted." If you decide to allow your child's participation, he/she is free to not answer any question or withdraw at any time without affecting those relationships.

How to Withdraw from the Study:

Your child may withdraw from the study at any time. If at any time your child no longer wishes to participate in the study, simply notify the researcher. Any data already collected related to your child will immediately be destroyed.

Contacts and Questions:

The researcher conducting this study is Johanna Herndon. You may ask any questions you have now. If you have questions later, you are encouraged to contact the researcher at (phone) "omitted" or (email) "omitted." The university advisor for this project is "omitted" and can be contacted at (phone) "omitted" or (email) "omitted."

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher or advisor, you are encouraged to contact the Institutional Review Board, 1971 University Blvd, Suite 1837, Lynchburg, VA 24502, or (email) irb@liberty.edu.

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

Statement of Consent:

I have read and understood the above information. I have asked questions and have received answers. I give consent for my child to participate in the study.

___ I give permission for my child to be videotaped during classroom observations.

___ I give permission for my child to be audio-recorded during interviews.

Signature of Participant _____ Date _____

Signature of Parent or Guardian_____ Date _____

Signature of Investigator _____Date _____

IRB Code Numbers: 1607.051313
IRB Expiration Date: May 13, 2014

Appendix B: Assent Form for Child Participants

ASSENT FORM
Child Participants

Assent of Child to Participate in a Research Study

What is the name of the study and who is doing the study?
This study is titled Teaching with Tables: A Case Study Investigating the Affective and Psychomotor Responses in Students and Teachers. The person conducting the research is Johanna Herndon.

Why are we doing this study?
We are interested in studying what effects are created for students and teachers when tables are used in a classroom instead of desks. Feedback from students is a really important part of this study.

Why are we asking you to be in this study?
You are being asked to be in this research study because students should be considered first when educators make decisions about what happens in a classroom. Your feedback is vital in establishing how using tables affects students. Your experiences and opinions are necessary to draw accurate conclusions about the topic.

If you agree, what will happen?
If you are in this study, you will be observed in class by the researcher in person or through the use of videotape. You may also be selected to participate in a one-on-one interview with the researcher. Interviews will be scheduled and last about 30 minutes.

Do you have to be in this study?
No, you do not have to be in this study. If you want to be in this study, then tell the researcher. If you don't want to, it's OK to say no. The researcher will not be angry. You can say yes now and change your mind later. It's up to you.

Do you have any questions?
You can ask questions any time. You can ask now. You can ask later. You can talk to the researcher. If you do not understand something, please ask the researcher to explain it to you again.

Signing your name below means that you want to be in the study.

_____ _____
Signature of Child Date

Primary Researcher: Johanna Herndon, (email) "omitted"
Research Advisor: "omitted"
Liberty University Institutional Review Board,
1971 University Blvd, Suite 1837, Lynchburg, VA 24502
or email at irb@liberty.edu.

Appendix C: Consent Form for Teacher Participants

CONSENT FORM
Teacher Participants

Title of the Study
Teaching with Tables: A Case Study Investigating Affective and Psychomotor Responses in Students and Teachers

Researcher
Johanna Herndon
Liberty University
Department of Education

You are invited to be in a research study involving the use of tables instead of desks in core content classrooms. You were selected as a possible participant because you are a faculty member with experience in these types of classrooms. I ask that you read this form and ask any questions you may have before agreeing to be in the study.

This study is being conducted by Johanna Herndon, Department of Education.

Background Information:

The purpose of this study is to explore the emotional and physical experiences of students and teachers in classrooms where tables are used exclusively in place of traditional desks. This research will specifically address the role that tables may have in relation to student attitudes, student and teacher confidence, aspects of community-building, and classroom dynamics, which all have connections to achievement.

Procedures:

If you agree to be a teacher participant in this study, I would ask you to do the following things:

(a) Participate in three 50-minute direct classroom observations by the researcher,
(b) Participate in three 50-minute videotaped classroom observations,
(c) Participate in a 30-minute audio-recorded one-on-one interview with the researcher,
(d) Allow for an examination of classroom documents related to administrative correspondence, classroom strategies (lesson plans), classroom management (seating charts, behavior logs), and
(e) Allow for an examination of classroom artifacts (student work samples).

Risks and Benefits of Being in the Study:

The risks of participating in this study are minimal. However, because you may be sharing your personal experiences, there is the risk that you may remember something unpleasant. You should also know that any information given to the researcher that indicates child abuse, child neglect, elder abuse, or intent to harm self or others requires mandatory reporting to the appropriate authorities. You can decide to withdraw from the study at any time if you feel uncomfortable with your participation.

There are significant benefits of participating in this study. You will help to provide important information that may improve the quality of classroom experiences for other students and teachers. This information will also help to establish a line of research involving the use of tables in high school classrooms.

Compensation:

You will not receive compensation for participation in this study.

Confidentiality:

The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a participant or the study site. Research data and records will be stored securely, and only I will have access to them. All data and records will be destroyed three years after the study is completed.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University, District "omitted," or High School "omitted." If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

How to Withdraw from the Study:

You may withdraw from the study at any time. If at any time you no longer wish to participate in the study, simply notify the researcher. Any data already collected related to you will immediately be destroyed.

Contacts and Questions:

The researcher conducting this study is Johanna Herndon. You may ask any questions you have now. If you have questions later, you are encouraged to contact the researcher at (phone) "omitted" or (email) "omitted." The university advisor for this project is "omitted" and can be contacted at (phone) "omitted" or (email) "omitted."

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher or advisor, you are encouraged to contact the Institutional Review Board, 1971 University Blvd, Suite 1837, Lynchburg, VA 24502, or (email) irb@liberty.edu.

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

Statement of Consent:

I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

___ I agree to be videotaped during classroom observations.

___ I agree to be audio-recorded during interviews.

Signature of Participant _____Date _____

Signature of Investigator _____Date _____

IRB Code Numbers: 1607.051313
IRB Expiration Date: May 13, 2014

Appendix D: Consent Form for Administrator Participants

CONSENT FORM
Administrator Participants

Title of the Study
Teaching with Tables: A Case Study Investigating Affective and Psychomotor Responses in Students and Teachers

Researcher
Johanna Herndon
Liberty University
Department of Education

You are invited to be in a research study involving the use of tables instead of desks in core content classrooms. You were selected as a possible participant because you are a faculty member with experience in these types of classrooms. I ask that you read this form and ask any questions you may have before agreeing to be in the study.

This study is being conducted by Johanna Herndon, Department of Education.

Background Information:

The purpose of this study is to explore the emotional and physical experiences of students and teachers in classrooms where tables are used exclusively in place of traditional desks. This research will specifically address the role that tables may have in relation to student attitudes, student and teacher confidence, aspects of community-building, and classroom dynamics, which all have connections to achievement.

Procedures:

If you agree to be an administrator participant in this study, I would ask you to do the following things:

(a) Participate in a 30-minute audio-recorded one-on-one interview with the researcher, and
(b) Allow for an examination of documents related to teacher correspondence, scheduling, student performance, and student behavior.

Risks and Benefits of Being in the Study:

The risks of participating in this study are minimal. However, because you may be sharing your personal experiences, there is the risk that you may remember something unpleasant. You should also know that any information given to the researcher that indicates child abuse, child neglect, elder abuse, or intent to harm self or others requires mandatory reporting to the appropriate authorities. You can decide to withdraw from the study at any time if you feel uncomfortable with your participation.

There are significant benefits of participating in this study. You will help to provide important information that may improve the quality of classroom experiences for other students and teachers. This information will also help to establish a line of research involving the use of tables in high school classrooms.

Compensation:

You will not receive compensation for participation in this study.

Confidentiality:

The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a participant or the study site. Research data and records will be stored securely, and only I will have access to them. All data and records will be destroyed three years after the study is completed.

Voluntary Nature of the Study:

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with Liberty University, District "omitted," or High School "omitted." If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

How to Withdraw from the Study:

You may withdraw from the study at any time. If at any time you no longer wish to participate in the study, simply notify the researcher. Any data already collected related to you will immediately be destroyed.

Contacts and Questions:

The researcher conducting this study is Johanna Herndon. You may ask any questions you have now. If you have questions later, you are encouraged to contact the researcher at (phone) "omitted" or (email) "omitted." The university advisor for this project is "omitted" and can be contacted at (phone) "omitted" or (email) "omitted."

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher or advisor, you are encouraged to contact the Institutional Review Board, 1971 University Blvd, Suite 1837, Lynchburg, VA 24502, or (email) irb@liberty.edu.

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

Statement of Consent:

I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

___ I agree to be audio-recorded during interviews.

Signature of Participant _____Date _____

Signature of Investigator _____Date _____

IRB Code Numbers: 1607.051313
IRB Expiration Date: May 13, 2014

Appendix E: District and Site Administration Approval Letter

Date

District/School Address
District/School Address
District/School Address

Dear _____:

As a graduate student in the Education Department at Liberty University, I am conducting research as part of the requirements for an Ed.D in Curriculum and Instruction, and I am writing to request permission to conduct research at _____ High School.

The exploratory case study that I have developed will investigate the use of tables and chairs instead of traditional desks in core high school classrooms other than science. I have identified three classrooms (language arts, math, and social studies) at _____ High School that all meet the criteria established for the study. The research will include classroom observations, interviews with students, teachers, and administrators, and examination of student records and work samples. All data collected will be coded and reported anonymously. Pseudonyms will be used for the site and for all participants during the study and in the final publication of results.

The purpose of the study is to investigate what affective and psychomotor effects are associated with the exclusive use of tables in classrooms, specifically in relation to constructs that are linked with achievement—attitude, self-efficacy, community-building, and environmental dynamics. The results of the study will establish a foundation for research on this topic, as little exists at present. It will also provide educators with empirical evidence upon which to make decisions concerning the future use of tables instead of desks in high school classrooms.

I appreciate your support in this academic endeavor. Your signature below will indicate your permission for me to conduct research and collect data at the site mentioned above. I welcome any questions you may have concerning the study. Thank you.

Sincerely,

Johanna Herndon
(email) “omitted”
(phone) “omitted”

_____	_____
Principal, (Site)	Date
_____	_____
Superintendent, (School District)	Date

Appendix F: IRB Approval Letter

LIBERTY
UNIVERSITY

The Graduate School at Liberty University

May 13, 2013

Johanna Herndon
IRB Approval 1607.051313: Teaching with Tables: A Case Study Investigating Affective and Psychomotor Responses in High School Students and Teachers

Dear Johanna,

We are pleased to inform you that your above study has been approved by the Liberty IRB. This approval is extended to you for one year. If data collection proceeds past one year, or if you make changes in the methodology as it pertains to human subjects, you must submit an appropriate update form to the IRB. The forms for these cases were attached to your approval email.

Please retain this letter for your records. Also, if you are conducting research as part of the requirements for a master's thesis or doctoral dissertation, this approval letter should be included as an appendix to your completed thesis or dissertation.

Thank you for your cooperation with the IRB, and we wish you well with your research project.

Sincerely,

(signature) "omitted"

(phone) "omitted"

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Appendix G: Email to Potential Administrator and Teacher Participants

Dear_____:

I am currently preparing for the research phase of my doctoral program through Liberty University. You are invited to participate in a research study which involves the use of tables instead of desks in core content classrooms. I have selected you as a possible participant because you are a faculty member with experience in these types of classrooms.

I would like to meet with you briefly to discuss your potential participation in this study. Please let me know when this would be convenient for you.

Thank you,

Johanna Herndon
(email) “omitted”
(phone) “omitted”

Appendix H: Email to Teacher Participants

Dear_____:

Thank you for your willingness to participate in my research study. I have identified your _____ period class as potentially viable for student participation. I would like to come to this class at your convenience to speak with your students regarding their participation. I will need approximately 25 minutes to explain the study, distribute consent forms to the students, and answer any questions they may have.

Please let me know what date is most convenient for me to come to your class.

Thank you,

Johanna Herndon
(email) "omitted"
(phone) "omitted"

Appendix I: Parent Email for Child Consent

PARENT EMAIL
(Consent and Assent forms were attached)

Dear Parent:

I am a teacher at High School "omitted" and a graduate student in the Education Department at Liberty University. I am conducting research as part of the requirements for an Ed.D in Curriculum and Instruction, and I am writing to request permission for your child's participation in a study at school.

The purpose of the study is to explore the effects of using tables instead of desks in high school core subject classrooms.

Today, your child was given Consent and Assent forms for participation in the study. These forms are also attached to this email. Please read both forms and discuss them with your child. In order for your child to participate, you will need to sign the Consent form and your child will need to sign the Assent form. Please return both to the participating teacher or me at school.

Thank you so much for your consideration.

Primary Researcher: Johanna Herndon, (email) "omitted"

Research Advisor: "omitted," (email) "omitted"
Liberty University Institutional Review Board,
1971 University Blvd, Suite 1837, Lynchburg, VA 24502
or email at irb@liberty.edu.

Appendix J: Interview Questions for Students

Teaching with Tables: A Case Study Investigating Affective and Psychomotor Responses in Students and Teachers

Time of interview:

Date:

Place:

Interviewer:

Interviewee:

The purpose of this study is to explore the responses of students who receive core instruction in a classroom that uses tables exclusively.

Questions:

1. How do you feel (emotionally) when you are seated at a table in _____ (language arts/math/social studies) class?

2. How do you feel (physically) when you are seated at a table in _____ (language arts/math/social studies) class?

3. What do you think are the benefits of sitting at a table in _____ (language arts/math/social studies) class?

4. What do you think are the drawbacks of sitting at a table in _____ (language arts/math/social studies) class?

5. What is your preferred type of seating in a classroom?

6. (Using photographs) What are your impressions about the two classrooms shown in these photographs?

Thank you for participating in this interview. All information gained in this interview is confidential and will be used for research purposes only.

(Creswell, 2007)

Appendix K: Interview Questions for Teachers

Teaching with Tables: A Case Study Investigating Affective and Psychomotor Responses in Students and Teachers

Time of interview:

Date:

Place:

Interviewer:

Interviewee:

The purpose of this study is to explore the responses of teachers who offer core instruction in a classroom that uses tables exclusively.

Questions:

1. Describe how you feel (emotionally) about teaching in a classroom with tables.

2. Describe how you feel (physically) about teaching in a classroom with tables.

3. What do you think are the benefits of teaching with tables?

4. What do you think are the drawbacks of teaching with tables?

5. What is your preferred type of seating in a classroom?

6. (Using photographs) What are your impressions about the two classrooms shown in these photographs?

Thank you for participating in this interview. All information gained in this interview is confidential and will be used for research purposes only.

(Creswell, 2007)

Appendix L: Interview Questions for Administrators

Teaching with Tables: A Case Study Investigating Affective and Psychomotor Responses in Students and Teachers

Time of interview:

Date:

Place:

Interviewer:

Interviewee:

The purpose of this study is to explore the responses of administrators who supervise teachers and students in core instruction classrooms that use tables exclusively.

Questions:

1. Describe your experiences in relation to the core teachers at your school who use tables exclusively in their classrooms.

2. Describe your experiences in relation to the students at your school who receive instruction from core teachers who use tables exclusively in their classrooms.

3. What do you think are the benefits of teaching with tables?

4. What do you think are the drawbacks of teaching with tables?

5. What is your preferred type of seating for a classroom?

6. (Using photographs) What are your impressions about the two classrooms shown in these photographs?

Thank you for participating in this interview. All information gained in this interview is confidential and will be used for research purposes only.

(Creswell, 2007)

Appendix M: Data Observation/Analysis Form

<table>
<tr><td colspan="2">Type of Data: Date:</td></tr>
<tr><td>Descriptive Notes</td><td>Reflective Notes</td></tr>
<tr><td>Attitude</td><td>Attitude</td></tr>
<tr><td>Self-efficacy</td><td>Self-efficacy</td></tr>
<tr><td>Community</td><td>Community</td></tr>
<tr><td>Environment</td><td>Environment</td></tr>
<tr><td>Description of Data</td><td rowspan="3">SKETCH OF CLASSROOM</td></tr>
<tr><td>Follow Up</td></tr>
<tr><td>Misc.</td></tr>
</table>

(Creswell, 2007)

Appendix N: Bracketing Out Checklist

1. Did I influence the collection of the data because of my position or experience? (Affirmative response requires data be stricken prior to analysis).

2. Did I interpret the data based solely on my experience? (Affirmative response requires that data be re-examined).

3. Did I negate or neglect any data because of my experience? (Affirmative response requires that data be reinstated and/or re-examined).

4. Did I present the data based solely on my experience? (Affirmative response requires new presentation of the data).

5. Did I agree/comply with the judgments of my critical colleagues? (Affirmative response reinforces bracketing out).

Appendix O: Calendar of Data Collection

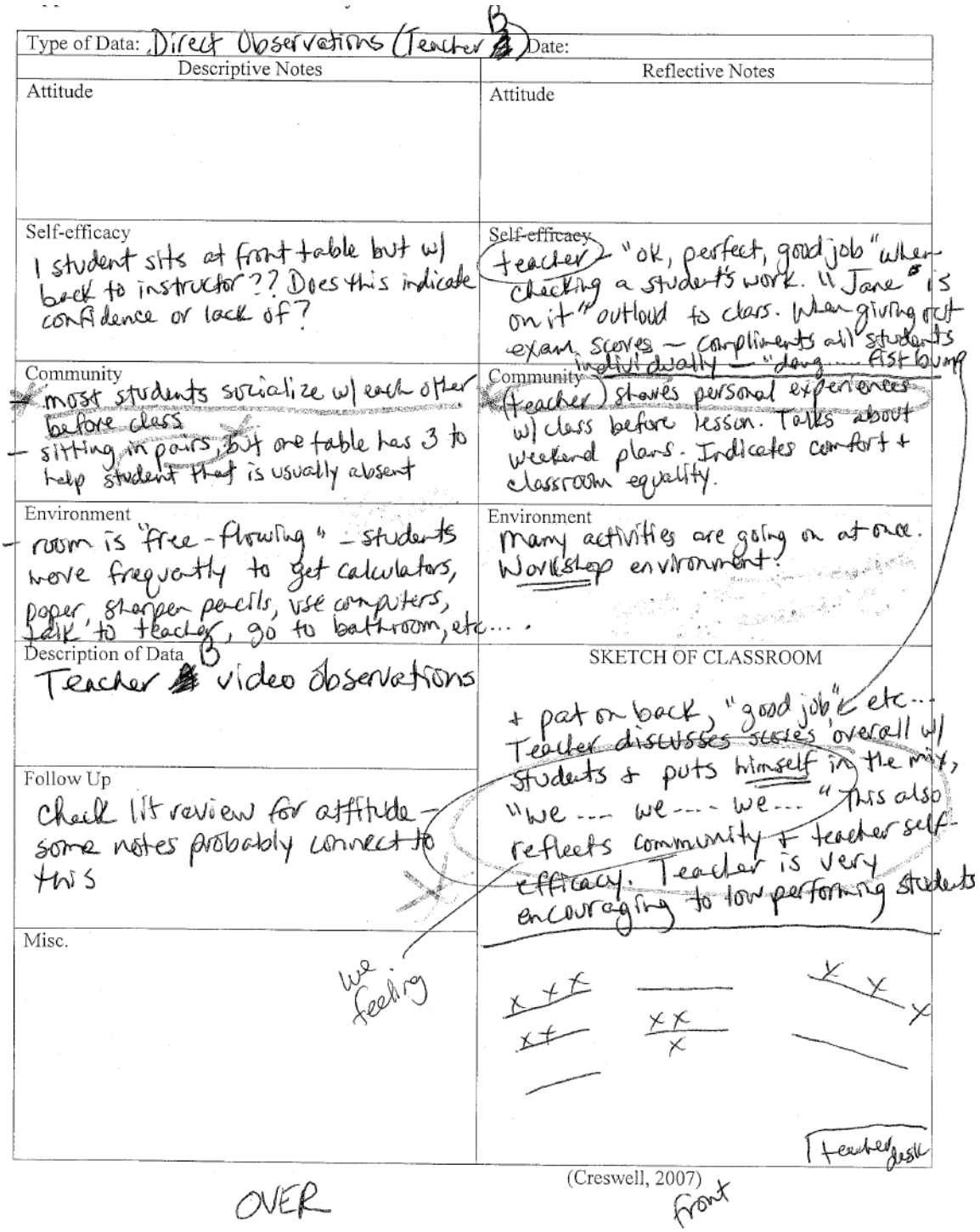
May 2013

12	13 IRB APPROVAL	14 Mtg. with L.A. teacher (documents) Mtg. with Math teacher (documents)	15 Mtg. with site bookkeeper (documents)	16 L.A. Part Observ. Math Part. Observ. S.S. Part. Observ.	17 L.A. Part Observ. Math Part. Observ. S.S. Part. Observ.	18
19	20 L.A. Part Observ. Math Part. Observ. S.S. Part. Observ.	21 Mtg. with site administration (documents)	22	23 Mtg. with site administration (documents) (2) L.A. artifacts examination & photos	24 L.A. students interviews (2) S.S. student interviews (3) S.S. artifacts examination & photos	25
26	27 Site closed - Memorial Day	28 L.A. Direct Observ. Math Direct Observ. S.S. Direct Observ. L.A. student interviews (4)	29 L.A. Direct Observ. Math Direct Observ. S.S. Direct Observ. L.A. student interviews (2) Math student interview (1)	30 L.A. Direct Observ. Math Direct Observ. S.S. Direct Observ. S.S. student interviews (2)	31 Math teacher interview S.S. teacher interview Math student interviews (5)	

June 2013

2	3 L.A. teacher interview Math artifacts examination & photos	4	5 Mtg. with S.S. teacher (documents)	6	7	8
9	10	11	12	13	14	15
16	17	18	19 Administrator interviews (3)	20	21	22

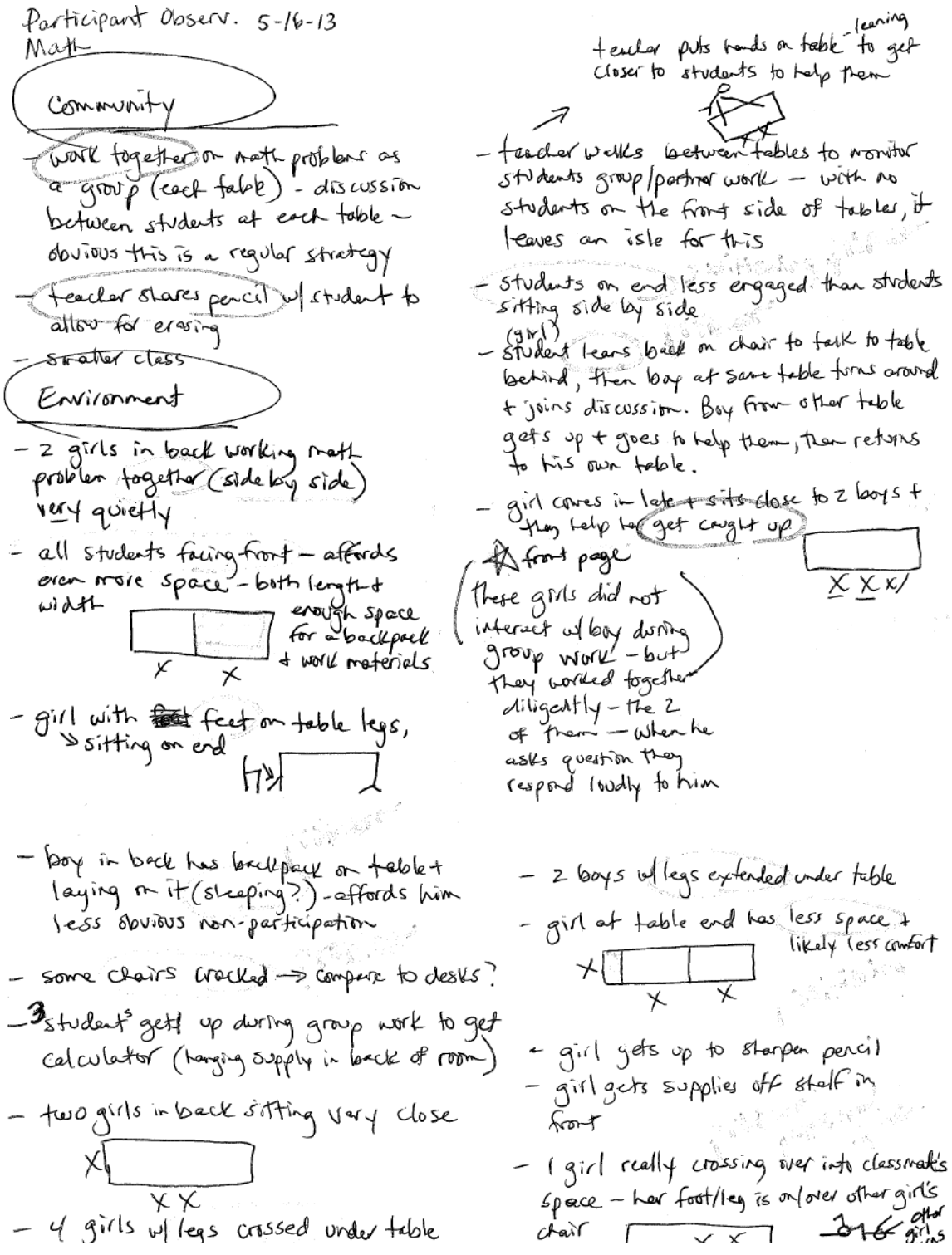
Appendix P: Direct Observation Research Notes Sample



(Creswell, 2007)

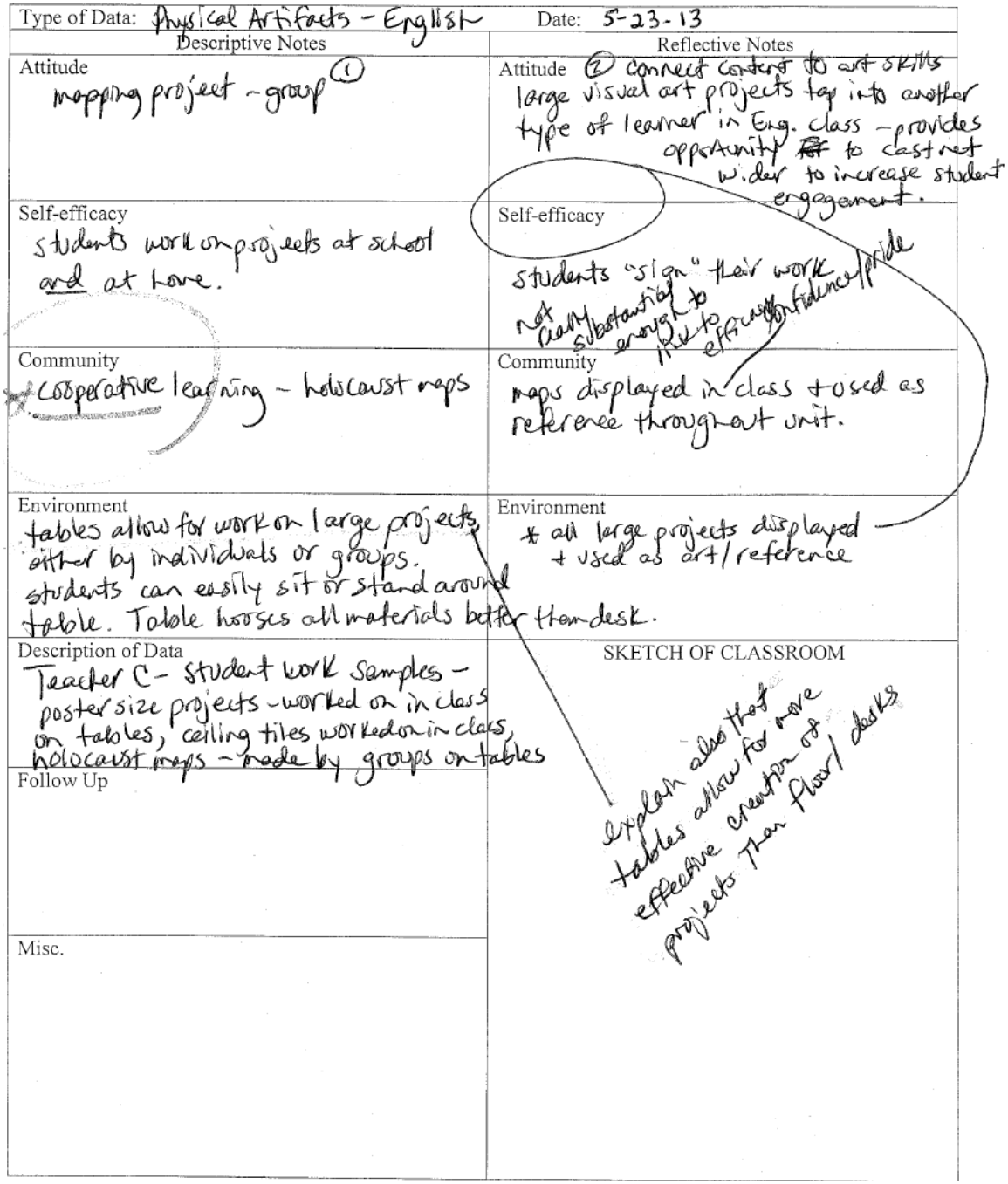
Note. Copy is not in color. Original research notes were color-coded according to construct and written on top of the observational field notes. In this sample, areas for all four constructs were highlighted and notations added.

Appendix Q: Participant Observation Research Notes Sample



Note. Copy is not in color. Original research notes were color-coded according to construct and written on top of the observational field notes. In this sample, areas for all four constructs were highlighted and notations added.

Appendix R: Physical Artifacts Research Notes Sample



Note. Copy is not in color. Original research notes were color-coded according to construct and written on top of the observational field notes. In this sample, areas for all four constructs were highlighted and notations added.

Appendix S: Administrator Perception of Teacher Efficacy, Community-Building, and Environmental Dynamics

	Teacher Efficacy	Community-Building	Environmental Dynamics
Positive Perception	Teachers that use tables are more collaborative in nature (2) They are strong disciplinarians (2) They are skilled instructors that use a high level of questioning (2) Their students are more emotionally secure (2) More varied instructional strategies are being used They are facilitators that encourage ownership of learning They collaborate more with other faculty members Teachers are more flexible and open to new things They are good classroom managers They do big activities Their classrooms are inviting	It fosters dialogue (2) It promotes a friendly social climate (2) Students don't feel left out/sense of belonging (2) The kids work together They learn from each other They learn to get along with each other They build friendships It allows the students the opportunity to share that community feeling It allows students to express themselves more freely It's like sitting down to dinner with your family They have the same feeling as when they're in the lunch room with their buddies	The layout promotes discussion and collaboration instead of "sit and get" (2) The non-traditional layout is more inviting Tables are more compatible to the use of technology We have more discipline problems when students are sitting behind one another than when they are sitting side by side It is easier and faster for the custodians to clean the rooms that have tables Student centered More space to create projects It creates a positive environment You have room to adapt the classroom environment
Negative Perception	Teachers with poor classroom management should not use tables Some teachers would not be able to adjust to using tables Teachers that mostly lecture would probably not like tables It takes time to get good at using tables	Some kids would rather be by themselves	Cheating is easier because students are sitting closer together (3) Table classrooms cannot be used for state standardized testing (3)

Note: Numbers in parenthesis next to a response indicate how many participants gave that response.

Appendix T: Student Perception of Self-Efficacy

	Language Arts Students	Math Students	Social Studies Students
Positive Impact on Self-efficacy	You can ask others for help (5)* I'm not alone (2)* It helps you discuss in class (2)* I feel confident (2)* I feel more outgoing with other students (2) It helps to sit at tables (1) It's easier to answer questions because there are other people around you (1) It makes you feel less awkward than if you're sitting by yourself (1) It helps you understand more (1)* I feel like I can ask questions without feeling "on the spot" (1) It's easier working in a group (1)	You can ask others for help (5)* I'm not alone (2)* When you're together, it helps you understand more (2)* It's easier to learn (2)* I can think more (1) I try to sit near the front of the class (1) It's okay to be wrong/not know what the answer is (1) The people at your table don't make you feel stupid (1) It's easier to communicate (1)* It's easier to make friends (1)	You can ask others for help (6)* I'm not alone (2)* It helps you in the real world (2) I don't feel drowsy and lazy (1) I learn better at tables (1) Learning is easier at tables (1)* It's easier to communicate (1)* It's good for discussion (1)* I feel confident (1)* I feel motivated (1) I feel open (1) I get to interact better (1) I don't have to ask the teacher for help (1)
Negative Impact on Self-efficacy	I feel exposed (1) At the beginning of the year with tables, "Who should I sit with?" (1)	On the first day, sitting at a desk is better because you can sit by yourself and not have to pick who to sit with (2) Sometimes if you rely on someone else, you get the answer wrong (1) I get distracted (1)	I feel overwhelmed (1) It brings my grades down when I get distracted (1) Sometimes I get too comfortable and I fall asleep (1) You can't learn as well when someone just tells you the answer (1) I don't always get my work done (1) Sometimes I don't pay attention (1)

Note: Numbers in parenthesis next to a response indicate how many participants gave that response. Asterisks indicate similar responses occurred in at least one other case.

Appendix U: Student Attitudes Toward Table Use

	Language Arts Students	Math Students	Social Studies Students
Positive Attitude	I like tables (7)*	I like tables (5)*	I prefer tables (5)*
	It's more laid back/relaxed/not stressful (6)*	I prefer tables (3)*	I feel positive (4)*
	I prefer tables (5)*	I feel positive (2)*	It is not boring/more fun (4)*
	I feel more comfortable (4)	It is not boring/more fun (2)*	I feel good (3)*
	We do activities instead of busy work (3)	It's more relaxed (1)*	I feel more relaxed (3)*
	I feel happy (3)*	Tables are better for Math (1)	Tables are better for all classes (3)*
	It's not boring (2)*	Tables would be good in all classrooms (1)*	I like tables (2)*
	I feel good (2)*	It's more helpful (1)	I don't like desks (1)
	It's not as strict (1)	It's more comfortable (1)	I am happy about it (1)*
			It's a better learning environment (1)
			Tables are better for Social Studies and English (1)
Negative Attitude	It is distracting (3)*	It is distracting (1)*	It is distracting (3)*
	It is noisy sometimes (1)*	Some people don't do their own work (1)	It can get loud (2)*
	It's harder to focus (1)*	Some students cheat (1)*	Sometimes I want to be alone (2)
	I feel uncomfortable (1)	Desks are better for Spanish and English (1)	It is easier for people to cheat (2)*
	I like desks better (1)*	I like desks better (1)*	I feel claustrophobic (1)
	Students don't pay attention to the teacher (1)		Too much talking (1)
			A desk helps with focus (1)*
			I would not like a table in Math (1)
			Desks are better for Math and Science (1)

Note: Numbers in parenthesis next to a response indicate how many participants gave that response. Asterisks indicate similar responses occurred in at least one other case.

Appendix V: Teacher Perception of Self-Efficacy

	Language Arts Teacher	Math Teacher	Social Studies Teacher
Positive Teacher Self-efficacy	I feel it is more conducive to collaboration* My classroom activities are more effective because of the tables* I feel more productive* I feel good that my students learn to work together* My classroom is student centered I feel good about being able to do independent and cooperative activities with my students For me, the tables are also a tool for learning I don't have behavior issues in my classes My students are more comfortable at tables My students feel safe My students are willing to take risks	There is more collaboration in my room now* I've discovered activities that are absolute gold* I plan differently now* I have more time to help individual students* My students work well together* I can get around the room better* I am less stressed teaching with tables I implement better strategies with tables The positives outweigh the negatives	My students collaborate more* I modify the curriculum so that students can work together* It is easier to manage my classroom* My students know how to get along with each other* I can move around really well* I have more eye contact with students at tables I feel more connected to my students I can see what's going on in the classroom better I think my students interpersonal and academic skills have improved I teach my kids about accountability to one another
Negative Teacher Self-efficacy	Sometimes the socializing is distracting* I worry about testing at tables* I'm very OCD so I struggle with the looseness sometimes* Sometimes I feel anxious about spacing	Learning to control the socialization was the hardest part* I am concerned about cheating on assessments* I get irritated by the background noise* I had to let go of strict organization* I've had activities blow up in my face It took me a while to adjust	Sometimes the students are too social*

Note: Asterisks indicate similar responses occurred for at least one other teacher.

Appendix W: Teacher Perception of Community-Building

	Language Arts Teacher	Math Teacher	Social Studies Teacher
Positive Perception of Community-Building	It feels like a family* They feel a sense of community* There is more interaction* They help one another* They are learning how to act socially, ethically, and morally They feel safe They are kind to one another Emotionally it is like having a support group They stand up for one another The kids have been good about maintaining personal space	They feel at home* There is a community atmosphere* They are a little community among the bigger community* Every kid puts a word or two in every day* The students teach each other* We're a team We all have the same goals We are going to do this together Everybody is accepted They leave their differences at the door	It's like a family around a dinner table* Tables act as a unit* It forces engagement* Students help each other* It is a social ice breaker You can't isolate yourself It teaches you how to reflect and listen to others Students contribute to a higher level of accountability Everyone is mixed together which creates an even playing field
Negative Perception of Community-Building	The kids that have grown up together are hard to separate	Some students don't like to work with others	

Note: Asterisks indicate similar responses occurred for at least one other teacher.

Appendix X: Student Perception of Community-Building

	Language Arts Students	Math Students	Social Studies Students
Positive Impact on Classroom Community	I am comfortable with my group (2)* You have to be considerate of other people (2)* Sitting with other people is a benefit (1)* We ask each other questions (1) We help each other (1)* Kids can interact with each other (1)* We do activities that include everyone (1) You feel like you have back up or support from those around you (1)* We can sit with our friends (1)* I get along with everybody (1)* There is more of a connection at a table (1)* Having other people at the table makes me feel protected (1)* I feel safe (1)* You don't lay your head down on a table (1) I like to talk to the people at my table (1) The class is more together (1)* We're all at ease with each other (1) We know each other pretty well by now (1)* Sitting at tables makes us come together (1)*	We help each other (4)* I like interacting with the people at my table (2)* I feel comfortable with the people at my table (1)* Everyone has different strengths (1) Wherever you sit, you're with someone (1)* It's like a family (1) You can depend on other people (1)* We get to know other people (1)* We work together (1)*	We interact more (4)* I can sit with my friends (3)* You can work out problems together (3)* Being close to people makes you feel more open (2) It helps me get to know people better (2)* The biggest benefit is being in a group (1)* It's better to have a group in case you need help (1)* You can depend on the people at your table (1)* There's always someone available to you (1)* It makes us feel closer (1) I feel connected (1)* It strengthens the bond with people in the classroom as well as in the classroom itself (1)* It helps with "getting along skills" (1)* It's more like the real world (1) We know when it's time to work and when we can talk (1) I feel good in a group (1) I feel safe in a group (1)* Cooperation is important (1)*
Negative Impact on Classroom Community		Sometimes you have to sit by someone that you don't like (3) You have to share your space (2) Sitting close to someone you don't know is awkward (1) You have to learn to adapt to having someone else's work with yours (1) Some people aren't good at working with others (1) Sometimes people are not considerate (1) Sometimes I would like to work with different people (1)	Some kids are hyped up and act crazy (1)

Note: Numbers in parenthesis next to a response indicate how many participants gave that response. Asterisks indicate similar responses occurred in at least one other case.

Appendix Y: Student Perception of Environmental Dynamics

	Language Arts Students	Math Students	Social Studies Students
Positive Environmental Dynamics	You are closer together so you can work together more easily (7)* There's more space/room (4)* You can move around more (3)* You can move the chair (3)* It lets us do group activities automatically (3)* I like being able to stretch my legs out (2)* It's easier for the teacher to get around to help students (2)* I like the atmosphere it creates (1) It's not cramped/crowded (2)* It's more open (1)* It's comfortable (1)* It's neater (1)* It feels like the lunch room (1) It feels like a computer class (1) It feels like an art class (1) A table supports a big project better than a bunch of desks (1)*	There is more space/room (4)* You can move around more (4)* It's more comfortable (4)* I like being able to stretch out my legs (3)* You can spread out your stuff (3)* You can move the chair (3)* It's not crowded (2)* The room is less crowded (1)* You are closer together so you can work together more easily (1)* You can sit at different angles (1)* It's a brighter environment (1) It's more open (1)* It is more organized (1)* You don't have to put your stuff on the floor (1)*	You can move around more (7)* You can move the chair (6)* You are closer together so you can work together more easily (5)* It is more comfortable (5)* There is more space/room (5)* There is more leg room (4)* There is more space to work (4) The room is not cramped (4)* It's more open (3)* There is more room for the teacher and students to walk around (3)* It lets us do group activities automatically (3)* There is more space for your stuff (2)* You don't have to put your stuff on the floor (1)* You can sprawl out at a table (1) A table supports a big project better than a bunch of desks (1)* It's harder to cheat at a table (1) The environment is definitely different (1) You can face all directions (1)* You have more control of the space (1)
Negative Environmental Dynamics	You have to be careful not to bump/kick other people (3)* You have to compete for space at the table (3)* When someone is sitting close to you it is easier to cheat (2)* Sometimes it's harder to see the front of the room (1) I am more comfortable when the chair is attached (1)	You don't get your own space (2)* Sometimes people shake the table or kick your feet (2)* You have to be careful that your stuff doesn't get mixed up with other people's (1) Sometimes people crowd you (1) It's easier for people to talk too much because they are close together (1)*	Sometimes it is hard to share the space at the table (3)* Sometimes people accidentally kick you under the table (3)* It's easier for people to talk too much because they are close together (2)* It would be better if all the tables were the same (1) The table is bumpy and hard to write on (1) It's easier to cheat at a table (1)*

Note: Numbers in parenthesis next to a response indicate how many participants gave that response. Asterisks indicate similar responses occurred in at least one other case.

Appendix Z: Teacher Perception of Environmental Dynamics

	Language Arts Teacher	Math Teacher	Social Studies Teacher
Positive Perception of Environmental Dynamics	It's easier to walk around tables* Students face each other instead of just the front of the class* Tables are more comfortable for taller or larger students It's easier to move a chair than an entire desk Students can work individually or in groups without moving furniture Tables provide a big work surface for projects Tables and chairs are more maneuverable The classroom structure is more student centered	It's easier to get around to students* Students are not isolated at tables* If I'm speaking to one student at a table, technically I'm speaking to all the Students at the table	It is easier to move around tables* Tables are inclusive by nature* The students interact more because they are facing each other* Tables promote cooperation instead of competition Tables foster unity
Negative Perception of Environmental Dynamics	It is hard to separate students when you need to* You have to share foot space under a table	Next time I would get better quality chairs* The students lean back in their chairs Students don't put chairs back where they go	You don't have any separation so kids talk too much sometimes* Because all the chairs are not the same, some are more comfortable than others* I would like all my chairs and tables to be uniform so everyone would feel the same

Note: Asterisks indicate similar responses occurred for at least one other teacher.