SUPPORTING LOW SOCIO-ECONOMIC STATUS MINORITY STUDENTS IN INDEPENDENT SCHOOLS THROUGH A PROFESSIONAL DEVELOPMENT LEARNING COMMUNITY ON THE BRAIN TARGETED TEACHING MODEL

by
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Abstract

Many teachers have beliefs about teaching that are derived from their personal experiences, educational experiences, family values, community engagement, observation of peers or colleagues, and professional development. Teacher efficacy is the belief teachers have about their abilities to teach all students. General teaching efficacy is the expected outcome or beliefs that teaching can impact student learning regardless of the action or task in a particular setting (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998).

This study examined the beliefs of teachers in an independent school through a professional development learning community, while focusing on the content of The Brain Targeted Teaching Model (Hardiman, 2012). This study also examined the beliefs and perceptions teachers hold about students, especially low SES minority students.

A mixed-method study was designed to investigate changes in teacher efficacy and teacher-student relationships as a result of the professional development. Action research methods were used to examine teachers’ practices in a systematic and inquiry-based approach. The five participants were teachers from an independent school located in a northwest American state.

The Teacher Efficacy Scale (Gibson & Dembo, 1984), classroom observations, the Brain Targeted Teaching Templates, interviews, and evaluation questions were used to understand teachers’ beliefs and perceptions about the students they teach in their classrooms, especially low SES minority students. Although, the results of this study were not statistically significant in personal teacher efficacy beliefs or general teacher
efficacy beliefs, qualitative evidence does suggest that participating in a professional
development learning community does support teachers in their beliefs about professional
development and the strategies used in The Brain Targeted framework.
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Dedication

This dissertation is dedicated to my best friend and soulmate, my husband, Roderick A. Butler. You are and will always be my inspiration, my reason for being the best that I can be and for believing in me. You have stood by me, pushed me and held my hand. I could not have completed this dissertation without your unwavering love and support. You stood tall with your quiet presence, your faith in God, putting family first and being the best husband and father on this planet. Now, after this long journey you are my angel with wings and my guardian in this life journey.

I also dedicate this dissertation to my daughters, Kaitlin and Nicolle Butler. You have heart and character that is beyond young years, with wisdom and strength beyond measure. I am very blessed to have two beautiful, intelligent, young women as my daughters. Your dedication and support never stopped.

Finally, to my parents Nancelia E. Scott-Jackson, Floyd McGlother Jackson and my two brothers Gary and Larry Jackson who are my role models. I have always looked up to all of you for your love, support, guidance, and strength. In doing so, I achieved all of my dreams because I had you as my family. You instilled in me a love of learning, the desire to understand, and seek knowledge, and to use my talents to help others. To my Mom, Nancelia, you are an inspiration of how to be a strong and determined woman. To my Dad, Floyd you persevered every step in your life meeting challenges head on. To my big brothers Gary and Larry, you are more than the best. You are what every little sister wishes for in two big brothers, you are my heroes.
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vii
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Table of Contents

Table of Contents.............................................................................................................. xi
List of Tables ....................................................................................................................... xvi
Executive Summary ............................................................................................................. xvii

Barriers that Exist in Student Achievement ................................................................. xvii
Underlying Factors in Student’s Academic Success ......................................................... xvii
Theoretical and Empirical Rational .................................................................................. xviii

Context of Study ................................................................................................................ xvi

Purpose of Study ................................................................................................................ xx

Chapter 1 ............................................................................................................................ 1

Introduction ......................................................................................................................... 1

Underlying Causes and Factors Related to the Problem of Practice ......................... 1

Conceptual Framework ...................................................................................................... 5

Social Cognitive Theory ................................................................................................... 5
Self-Efficacy ......................................................................................................................... 6
Teacher Efficacy Theory .................................................................................................... 7
Student Achievement and Teacher Efficacy Theory ......................................................... 9

Variables that Affect Teacher Efficacy and Student Performance 10

Teacher Efficacy and Student Characteristics .............................................................. 12

Statement of the Research Problem Including Project Objectives 14

Chapter 2 ............................................................................................................................ 1

Needs Assessment Methodology and Findings ............................................................... 15

Description of the Context .............................................................................................. 15
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Audience – Stakeholders and Their Information Needs</td>
<td>18</td>
</tr>
<tr>
<td>Needs Assessment Research Questions</td>
<td>18</td>
</tr>
<tr>
<td>Method</td>
<td>19</td>
</tr>
<tr>
<td>Sample and Participant Selection</td>
<td>19</td>
</tr>
<tr>
<td>Instruments</td>
<td>22</td>
</tr>
<tr>
<td>Teacher Beliefs and Perception Survey</td>
<td>22</td>
</tr>
<tr>
<td>Procedure</td>
<td>22</td>
</tr>
<tr>
<td>Needs Assessment Findings</td>
<td>23</td>
</tr>
<tr>
<td>Research Question 1</td>
<td>23</td>
</tr>
<tr>
<td>Research Question 2</td>
<td>23</td>
</tr>
<tr>
<td>Research Question 3</td>
<td>25</td>
</tr>
<tr>
<td>Discussion</td>
<td>25</td>
</tr>
<tr>
<td>Chapter 3</td>
<td>30</td>
</tr>
<tr>
<td>Intervention Literature Review</td>
<td>30</td>
</tr>
<tr>
<td>Teacher Efficacy and Professional Development</td>
<td>30</td>
</tr>
<tr>
<td>Teacher Efficacy Beliefs</td>
<td>30</td>
</tr>
<tr>
<td>Effective Teacher Professional Development</td>
<td>31</td>
</tr>
<tr>
<td>Teacher Efficacy and Professional Development</td>
<td>33</td>
</tr>
<tr>
<td>Professional Development Learning Communities</td>
<td>34</td>
</tr>
<tr>
<td>Classroom Behavior, Cultural Barriers, and Teacher Efficacy</td>
<td>33</td>
</tr>
<tr>
<td>Professional Development on Neuroscience and</td>
<td></td>
</tr>
<tr>
<td>Teacher Efficacy</td>
<td>36</td>
</tr>
<tr>
<td>Proposed Solution</td>
<td>41</td>
</tr>
</tbody>
</table>
Chapter 4........................................................................................................................................43

A Mixed-Method Study ..................................................................................................................43

Intervention Overview ..................................................................................................................43

Professional Development Learning Community on Brain Targeted Teaching .....................43

Methodology ..............................................................................................................................44

Research Design ..........................................................................................................................44

Sample, Participation Selection, and Site Identification .................................................................46

Demographics of the Focus Group Participants .........................................................................47

Instruments and Measures ...........................................................................................................48

Teacher Efficacy Scales ................................................................................................................48

Brain Targeted Teaching Implementation Checklist .................................................................48

Classroom Lesson Plan Templates .............................................................................................49

Brain Targeted Teaching Planning and Preparation Template ....................................................49

Procedure .....................................................................................................................................49

Intervention Procedure ..............................................................................................................49

Science and Literacy Lesson Plans ............................................................................................51

Introduction Session ..................................................................................................................56

Session One ...............................................................................................................................56

Session Two ...............................................................................................................................56

Session Three ............................................................................................................................57

Session Four ...............................................................................................................................57
Data Collection – Quantitative and Qualitative .............................58
Data Collection Procedure ..........................................................58
Survey ..................................................................................59
Interviews .............................................................................59
Reflections .............................................................................59
Data Analysis .........................................................................60
Data Management ..................................................................60
Qualitative Data Coding .........................................................60
Evaluation Questions ..............................................................62
Chapter 5 ................................................................................64
Results and Discussions ..........................................................64
Overview of the Teacher Efficacy Scale and the Research Questions ....65
Themes ..................................................................................65
Research Question 1 ..............................................................67
How to Motivate and Engage Students in Their Learning ..........69
Environmental Influences That Affect Student Learning ..........70
Reinforcing New Knowledge ..................................................72
Cultural Awareness ...............................................................74
Research Question 2 ..............................................................76
Discordance Between Efficacy Beliefs and Behaviors ............77
Discordance Between Beliefs and Classroom Management .......
Behaviors .............................................................................79
Alignments of Beliefs with Instructional Behaviors During ........
Discordance Between Beliefs and Academic Outcomes ...........84
Changes in Instructional Practices During the Professional Development ...........................................85
Increasing Motivation to Learn ........................................86
Understanding Environmental Influences ........................................88
Reinforcing New Knowledge ...............................................91
Individual Conferences with Students to Reinforce Learning .................................................92
Integrating Art, Reflection, and Writing to Reinforce Learning .......................................................94
Using Graphic Organizers to Reinforce Learning .................................................................95
Research Question 3 .............................................................98
Inconsistent and Mixed General Teacher Efficacy Beliefs ........98
Understanding Environmental Influences That Affect Learning in the Classroom .................100
Student Demographics ..........................................................101
Acknowledging Personal Biases ..............................................103
Stress and Emotions in the Learning Environment ..........104
Margaret’s Story .................................................................106
Part 1: Emotional Connections .............................................106
Part 2: Margaret’s Struggle with Her Student’s Emotions ..........107
Mary’s Story ........................................................................110
Part 1: Acknowledging Student’s Emotions ......................110
Part 2: Mary Considers How Her Actions Affect Her Students

Carol’s Story

Changing Practices After Observing Colleagues

Research Question 5

Professional Development

Embedding Professional Development Programs into the Classrooms

Expanding Neuroscience with Teachers and Direct Application to Students

Professional Development and Increasing Teacher Efficacy

Participant’s Engagement in Action Research and Self-Efficacy

Cultural Awareness and Multicultural Education

Summary

Implications for Practice

Limitations

Conclusions

References

Appendix A: Teacher Efficacy Scale

Appendix B: Brain Targeted Teaching Implementation Checklist

Appendix C: Classroom Lesson Plan Templates

Appendix D: Brain Targeted Teaching, Planning and Preparation
List of Tables

Table 1.1 Ecological Framework for Variables Associated with Teacher Efficacy ......................................................... 16

Table 2.2. Demographics of Survey Participants Kindergarten Through 5th Grade .......................................................... 18

Table 2.3. Research Questions, Data, Timeline, and Analysis .......................................................... 25

Table 2.4. Variable, Operational Definition, (s) and Valid Indicator ............................................... 26

Table 3.1. Research Questions, Data, Time, and Analysis .......................................................... 57

Table 4.1. Literacy Lesson Plan 1 ........................................................ 50

Table 4.2. Science Lesson Plan 2 ........................................................ 50

Table 4.3. Research Questions, Data, Timeline, and Analysis .......................................................... 61

Table 5.1. Personal Teaching Efficacy ........................................................ 74

Table 6.1. General Teaching Efficacy ........................................................ 99
List of Figures

Figure 2.1 Demographics of Survey Participants Kindergarten Through ............................

5th Grade .......................................................................................................................... 20

Figure 2.2 Number of Years Survey Participants Have Taught in Independent ......

Schools .............................................................................................................................. 21

Figure 2.3 Number of Years Survey Participants Have Taught.................................

in Public Schools .............................................................................................................. 21

Figure 4.1. Action Research Framework ......................................................................... 42
Executive Summary

Barriers that Exist in Student Achievement

Within the context of Smith Academy, barriers exist that prevent students from low socioeconomic families from achieving academic success. These students continue to struggle academically despite social and emotional counseling and academic intervention. Research indicates that many students’ academic performance is affected negatively by their socio-economic status, which may be related to a child’s experiences in their home environment, the community they live in, and their lack of early exposure to educational resources (Noble, Norman, & Farah, 2005). Many children from low SES families are often at risk because they have not had exposure to develop academic skills in a positive learning environment (Burger, 2009). Smith Academy provides families from diverse backgrounds learning opportunities and experiences in an excellent educational environment. Yet, for some low SES students the academic gap continues to widen and these students fall further behind compared to their peers. Smith’s Academy current graduation rate is approximately 95% for those who will attend four-year colleges or universities. However, the retention rate of low SES students continues to decline. This intervention is designed to provide professional development for teachers to increase their awareness, efficacy beliefs, and skills in teaching all students, in particular students from low socio-economic background.

Underlying Factors in Student’s Academic Success

According to the U.S. Department of Education (2013) the achievement gap is defined as the difference in student performances between different racial, ethnic, and
socio-economic groups. However, the achievement gap is a problem that is multidimensional and can be examined through numerous perspectives. The association between poverty and student achievement has been documented and clearly points to discrepancies that African Americans, Hispanics, and other racial groups experience in a school setting. Poverty is not the only reason why a child’s academic achievement declines or is affected by their school performance. These include family background, quality of education, school resources, and teacher effectiveness. The quality of education and the duration of their classroom experiences is critically important in the cumulative effect in educating children. Among the factors that impact teacher effectiveness, teacher efficacy is one variable that may account for the differences among students in a classroom.

Theoretical and Empirical Rationale

Context of the Study

The context of this study focuses on kindergarten through 5th grade students and teachers in a K-12 independent private school. The goal of this study is to examine the effects of professional development for teachers using The Brain Targeted Teaching Model (Hardiman, 2012) to enhance teaching pedagogy by providing teachers with research strategies that support the development and academic growth of students. Focusing this study on professional development, collaboration, and reflection for the faculty may increase the effectiveness of teachers to promote learning. The objective of using the Teacher Efficacy Scale (Gibson, S., & Dembo, M. H. 1984) is to investigate whether the influence of teachers’ beliefs and perceptions affect the outcomes of students.
in their classrooms, especially low SES students.

The theoretical rationale for this study is based on research in teacher self-efficacy and social cognitive theory, specifically the relationship between teacher self-efficacy and student achievement. Tschannen-Moran, Woolfolk Hoy and Hoy (1998) defined teacher efficacy as a teacher’s judgment of his or her capabilities to bring about desired outcomes of student engagement and learning, even among those students who may be struggle academically or are unmotivated. A teacher’s sense of efficacy and their judgments about their own abilities to encourage a student’s learning is one of a few teacher characteristics that were examined by the RAND study, and indicated as an underlying factor in student outcomes (Hoy & Spero, 2005). Research suggests teachers with a higher sense of self-efficacy are more likely to provide skills and strategies and create a more positive classroom environment to students who are struggling academically. A problem exists with teacher efficacy beliefs, especially when working with low SES and minority students.

The empirical rationale for this study is based upon the results from the needs assessment at Smith Academy. Teachers reported that they believe they are making positive impacts with their students in the classroom. They believe they are encouraging and supportive to their students while creating an atmosphere of trust and respect. However, teachers indicated some students lack motivation, are disinterested in learning, and lack internal motivation in the classroom. Many teachers indicated that they grappled with making connections with some students from different cultural backgrounds or different socio-economic levels they struggled to make. Conversely, teachers indicated a student’s cultural differences and motivation are not barriers nor do they affect academic
success. Yet, teachers revealed a student’s ability to self-regulate or self-manage their behavior along with a student’s attentional issues were viewed as barriers that affect their academic success in the classroom. These findings point to the need to examine the beliefs and perceptions of teachers, how they engage all students in their learning, and how they teach students from diverse backgrounds as a result of this intervention.

**Purpose of the Study**

The purpose of this study is to explore whether changes occur in teacher efficacy beliefs and instructional practices as a result of implementing the Brain Targeted Teaching framework to enhance teacher instruction. The potential solution is to investigate the belief efficacy of teachers whose educational and professional background is varied along with their teaching experience. Introducing the Brain Targeted Teaching framework is based on effective research instruction that helps teachers understand how brain development occurs in learning and what external factors affect student learning in the classroom.

The process of implementation involves conducting a professional development for the faculty at Smith Academy over the course of six weeks. Teachers collaborated with each other in a focus group study after the presentation of four of the six Brain Targets. This study engaged teachers in a professional development learning community using action research methodology as researchers in which teachers designed lesson plans within the focus group, by using the Brain Targeted Teaching framework. Teachers engaged with each other on the Brain Targets and reflected with their peers while creating instructional lessons that better support diverse learners. Teachers collaborated
with each other in how to develop meaningful ways to build relationships with their students through positive feedback during instruction and individual conferencing with students and understanding students’ socio-economic and cultural differences that have an impact on learning in the classroom. The objective is for teachers to participate as researchers, investigate specific classroom problems or academic and social issues with students, share ideas and support from colleagues, and develop knowledge that supports all students, in particular low SES minority students. The professional development learning community on the Brain Targeted Teaching framework used a mixed-method study designed to explore changes in teacher efficacy and teacher-student relationships as a result of the professional development. Teacher efficacy beliefs will be assessed using The Teacher Efficacy Scale to measure personal teaching efficacy and general teaching efficacy. Qualitative data were collected through evaluation responses, collaborative meetings with the focus group participants, classroom observations, lesson plans, Brain Target lesson templates, note taking, and interviews.

The mixed-method study through a professional development learning community offered an opportunity for teachers to collaborate with each other while engaging in action research methodology to develop new learning strategies to support low SES minority students, and increase teachers’ awareness of students with diverse backgrounds and learning needs.
Chapter 1

This dissertation study is organized into five chapters. In the first chapter, literature is reviewed concerning the belief and perception a teacher has in their capabilities to teach all students in their classrooms, especially students from low socioeconomic backgrounds in the United States. As a about their students and their ability to learn and how they teach those students in their classrooms. The second chapter, describes the needs assessment study which examined the teachers’ beliefs in one independent school in a northwest American state. In the third chapter, research literature related to interventions on teacher efficacy and professional development to enrich teaching practices which support student learning is reviewed and evaluated. Finally, the fifth chapter presents the findings, results, and discussion.

Introduction

This literature review discusses the concepts of teacher efficacy beliefs and the relevant research investigating the relationship between teacher efficacy beliefs and the growing concern of low socioeconomic status (SES) minority students’ underachievement in the United States. This chapter will explain the framework of literature in social cognitive theory, self-efficacy theory, and teacher efficacy theory in order to identify and define variables that affect student performance in the classrooms, especially regarding low SES students and minority students.

Underlying Causes and Factors Related to the Problem of Practice

Students from a variety of socioeconomic backgrounds attend independent schools, but student achievement and outcomes vary based upon their different socioeconomic levels. Recent research indicates that children living in high-poverty
communities, as compared with their counterparts living in lower rates of poverty are
disadvantaged by their access to high quality public and private services, such as child
care, schools, health care and community resources (APA, 2016). The American
Psychological Association (2016) indicates that socioeconomic status (SES) includes an
individual’s education, income, and occupation, and SES can be determined by limited
access to resources, such as quality health care, education, or employment opportunities.
Low SES status can be associated with factors such as poverty, inequities in educational
resources, poor health, and low income (APA, 2016). Children from poverty areas often
struggle academically, and household wealth has been associated with school
achievement (Willingham, 2012). According to Milne and Plourde (2006), however,
many students from low SES backgrounds achieve academic success; their findings
suggest that children from low SES homes can succeed given the right support to both
parents and students. The Council for American Private Education (CAPE), indicate
private schools are typically more academically challenging than public schools in terms
of curriculum, and standardized assessments (Alt & Peter, 2002 September 14). While
private schools strive towards improving low-SES student achievement compared to their
public school counterparts, there are still students from lower SES households who fall
below grade level and struggle academically. While many factors influence achievement
and academic outcomes, a student’s economic status can play a significant role in their
academic achievement.

In addition to the stunted progress of lower SES students in public schools,
minority students’ achievement in private schools also suffers. According to the National
Association of Independent Schools [NAIS], 2012-2013 states, 27.5% of students
attending independent schools in the United States are students of color; compared to 67.3% which were European American students. Many parents consider private schools for their children because of the perception that the quality of education is better than public schools (Anonymous Parent, Smith Academy, September, 2014). While this may be an accurate assumption, gaining admissions into private schools is very competitive and expensive. Higher SES parents have more academic resources that their children are exposed to before they enter schools. Parents who have access to economic opportunities can enhance their child’s learning through opportunities outside of the school environment, which may increase their academic development (Lareau, 2011). Low SES minority students, however, may struggle even before they enter independent schools because of lack of exposure to developmental opportunities for example, quality daycare, or equitable access to educational materials. While many students enter private schools, low SES minority students comprise a small number of students who enter private schools compared to the number of European American students. According to the National Center for Educational Statistics NCES (2013), 10 percent of all students that entered private schools were African American students, compared to 70 percent of all private school students were White, non-Hispanic.

For some families from lower SES households, it is challenging to provide the academic support needed for their children. Lack of access to educational resources, technology, and financial resources makes it difficult for parents to give their children the foundation they need to be successful in their early educational school years. Beatty (2013) suggests the achievement gap between higher SES students and lower SES students develops even before children enter kindergarten. Many kindergarten students
from higher SES backgrounds have cognitive scores 60% higher than their lower SES counterparts. Research indicates that children from low SES environments may struggle in reading, writing and mathematics and they can often lag behind their higher SES peers in standardized assessments (Noble, Norman, & Farah, 2005).

Among the inequities in educational resources for low SES students, variables within the school environment that affect student achievement include teacher expectations or beliefs, academic curriculum, insensitivity to various cultural backgrounds of students, lack of multi-cultural education for teachers (Desimone & Long, 2010; Hoy & Spero, 2005; Sleeter, 2001).

Factors related to the quality of teachers can have a profound effect on the academic outcome of students from low SES environments. In fact, problems with the quality of teachers and teacher’s sense of self-efficacy impact student achievement greatly (Ashton & Webb, 1986; Coleman, 1966). Recent studies have shown that a positive relationship between a teacher’s efficacy beliefs and student achievement can lead to greater chances of student success (Midgley, Feldlaufer, Eccles, 1989). Teacher self-efficacy is an important link in teaching, and learning and can contribute to the academic achievement of students (Gibson & Dembo, 1984). Low teaching efficacy, conversely, can also contribute to the failure of low SES and minority students (Ashton & Webb, 1986).

Within the independent school setting, low socio-economic status minority students face similar and unique barriers that prevent them from achieving academically. Not only does this problem exist among most independent schools, but this problem has also surfaced at Smith Academy, an independent school located in a major city in a
northwest American state. There are a number of high SES minority students who are achieving academically at Smith Academy. These students typically graduate and attend college. However, this research will only focus on low SES minority students who are struggling to succeed academically at Smith Academy. Thus, this dissertation focuses on examining barriers to student academic success that exist within the school structure and are related to the quality of teachers and teachers’ sense of self-efficacy.

**Conceptual Framework**

The conceptual framework for this study is based upon Bandura’s (1977) work on learning, and behavior in a social context. The social context is the classroom environment in which learning occurs for children and is shaped by the instructional methods of a teacher, their personal beliefs about learning, and a teacher’s expectations of learning for the students. Self-efficacy is defined as one’s belief in their abilities to achieve a positive outcome or task. Teacher efficacy is a concept expanded from self-efficacy that addresses teachers’ ability to feel confident that they can produce change in learning outcomes for students (Ashton & Webb, 1986).

**Social Cognitive Theory**

Social cognitive theory describes the relationship between the individual, the behavior of the individual, and the environment. Bandura (1977) claimed that an individual’s behavior and their environment affect each other and the environment influences the behavior. The relationship between these factors is viewed as reciprocal rather than one directional (Bandura, 1977). From this theoretical perspective, cognition, an individual’s behavior, and environmental influences interact with each other and create a triadic reciprocity (Bandura, 1986). While social cognitive theory includes
several constructs, the theoretical framework for this study will include the two most relevant to teacher beliefs: self-efficacy and outcome expectancy.

Bandura’s (1977) view of learning is based upon a key aspect of life development that is acquired through observational learning. Observational learning occurs, while observing how others perform a task or imitating the actions of others. Bandura (1977) suggests the process of observational learning may be viewed in the classroom when teachers are working to improve students’ cognitive abilities through learning, changing habits of thinking and behaving to improve their academic skills while changing or regulating behavior all within the dynamics of a classroom structure. This process is referred to as the triadic reciprocal determinism in which the individual, environment and the individual interact with each other. Bandura (1977) claims personal factors and an individual’s self-belief allows a person to have control over their thoughts, feelings and actions. This in turn affects how individuals think, behave, perceive, and feel about their experiences within their environment.

**Self-Efficacy**

Self-efficacy is the belief in one’s abilities to organize and accomplish a task or goal (Bandura, 1986). Within the development of self-efficacy, Bandura (1977) suggests four major influences on or sources of efficacy expectations: mastery of experiences, physiological and emotional states, vicarious experiences, and encouragement from experienced teachers (Hoy & Spero, 2005). Self-efficacy is built through mastery of experiences and gaining confidence in performance of skills. Mastery experiences are directly related to successful engagement in behavior that can bring about change or desired outcomes (Bandura, 1977).
An individual can relate their experiences to the success and the outcomes of an activity or task and thus, increase their self-efficacy. Secondly, self-efficacy is built through a task or activity that is attainable and by observing others achieving a similar goal, reinforces the success or the ability to accomplish the same goal. Self-efficacy is also influenced by verbal persuasion and social interactions that are received from others. Those messages can be positive or negative and can affect an individual’s belief system. Physiological factors such as stress, anxiety or happiness can enhance or hinder self-efficacy. Bandura (1977) asserts that the most important personal factor in changing behavior is self-efficacy.

**Teacher Efficacy Theory**

Researchers have applied Bandura’s social cognitive learning theory to education through the construct of teacher efficacy. Bandura (1977) suggests that motivation is affected by outcome expectations and efficacy expectations, both of which are interrelated. An outcome expectancy is an individual’s assessment that a particular behavior will produce a subsequent outcome. How individuals respond to an outcome depends mostly on their own judgments of how well they will perform. Woolfolk, Rosoff, and Hoy, (1990) suggest the two elements of teaching efficacy (Ashton & Webb, 1986) and Bandura’s (1977) outcome and efficacy expectations are in agreement; however, Bandura suggests outcome expectations arise from an individual’s judgments of their actions and efficacy expectation is based on an individual’s judgment with regard to capabilities. Teacher efficacy research grew from the results of the RAND (Armor et al., 1976) study, which indicated strong variations in reading achievement scores in minority students. They also found a strong correlation between a teacher’s sense of efficacy and
student achievement after two efficacy items were added to a broad questionnaire, which then initiated an interest in teacher efficacy research. Gibson and Dembo (1984) state in their research that a teacher’s belief in their ability to instruct students may explain the individual differences in teaching effectiveness. Thus, teacher efficacy theory grew out of social cognitive theory in an effort to examine the positive relationship of teacher self-efficacy, student’s academic performance, and individual differences in teaching effectiveness to promote student success.

The theory of teacher efficacy is a two-part belief that includes personal teaching efficacy and general teaching efficacy (Ashton & Webb, 1986). When these two constructs are put in the context of teaching and applied in the classroom it is possible to understand the dynamics of the relationship between teachers and student achievement. Many teachers have beliefs about teaching that are derived from their personal experiences, educational experiences, family values, community engagement, observations of observing peers or colleagues, and professional development. Bandura’s (1977) seminal work on self-efficacy that describes four main sources of efficacy information for individuals, is traditionally gained through teachers’ credential programs. Student teaching experiences provide most of the sources for novice teachers, however those experiences do not account for the wide range of experiences that teachers will be presented within their own individual classrooms.

Teacher efficacy, in general, is a teacher’s belief or perception in his or her own abilities to complete a task or duty (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998). Personal teaching efficacy (Ashton & Webb, 1984) is the belief that teachers have the confidence or skills to influence the performance of students. Within a class room it is the
teacher’s belief that they can influence the outcomes of student achievement in a positive way. General teaching efficacy is the expected outcome or belief that teaching can impact student learning in general regardless of the action or task in a particular setting (Tschannen-Moran, et al., 1998). The research indicates that teacher efficacy is an important variable that can promote or hinder academic gains in the classroom.

**Student Achievement and Teacher Efficacy Theory**

Empirical studies have recognized teacher efficacy as a predictor of student outcomes, (Bandura, 1993; Goddard, Hoy, & Woolfolk, 2000), teacher retention in the workforce (Hoy & Spero, 2005), and quality of classroom instruction (Midgley, Feldlaufer, & Eccles, 1989). Furthermore, they also state that teachers in high achieving schools spend more time on instructional lessons and engaging in students’ achievements, which produce positive outcomes in the school climate and academic achievement. By referring to Bandura’s theory of self-efficacy and applying the concept to teaching efficacy, the outcome expectancy for teachers with high self-efficacy and high personal efficacy would likely result in the persistence in their coping strategies when students may not produce the desired outcomes (Gibson & Dembo, 1984). Teachers who are successful in their ability to help students achieve academic success are able to create a more focused environment for their students in the classroom (Gibson & Dembo, 1984). In contrast, teachers who have low expectations of their students and their students’ ability to learn may fall short in their abilities to be persistent with a child through difficult academic times (Mangiante, 2010). As a result, those students may begin to fall behind academically or are referred to counseling and other means of academic support. The hope is that these students will make more progress with one-to-one tutorial support.
In Midgley, Feldlaufer, and Eccles’ (1989) longitudinal study, they examined math teachers’ sense of efficacy with students transitioning from junior high school. The results showed a significant relationship between teacher efficacy and the expectations of students and the performance in students’ first year of junior high school. Teachers who displayed a positive sense of efficacy for teaching mathematics believed that students exhibited positive performance and expected students to perform better in the future. Students whose teachers were more efficacious rated math less difficult than students whose teachers were less efficacious. Research indicates that there is a correlation to a teacher’s personal efficacy, student’s perception about their own performance, and the subject matter and the nature of the subject matter. This particular study indicates the critical relationship between teacher efficacy with their students before entering junior high school and after their spring year in junior high. How teachers’ beliefs and perceptions are communicated, and their expectations of students, is influenced through their instructional practices and influenced by their motivational strategies with students (Midgley, et al. 1989).

Variables that Affect Teacher Efficacy and Student Performance

A teacher’s sense of efficacy is influenced by the context in which the teacher works. Factors that influence teacher efficacy are constructed on Bandura’s (1977) four sources of efficacy as examined by Ashton and Webb (1986) that classify variables that influence teacher efficacy. These factors are identified and established within the educational environment.
Table 1.1.

*Ecological Framework for Variables Associated with Teacher Efficacy*

<table>
<thead>
<tr>
<th>System Level</th>
<th>Influential Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsystem</td>
<td>Student Characteristics</td>
</tr>
<tr>
<td></td>
<td>Teacher Characteristics</td>
</tr>
<tr>
<td></td>
<td>Teacher ideology</td>
</tr>
<tr>
<td></td>
<td>Role definitions</td>
</tr>
<tr>
<td></td>
<td>Class size</td>
</tr>
<tr>
<td></td>
<td>Activity structure</td>
</tr>
<tr>
<td>Mesosystem</td>
<td>School size and demographic characteristics</td>
</tr>
<tr>
<td></td>
<td>School norms</td>
</tr>
<tr>
<td></td>
<td>Collegial relations</td>
</tr>
<tr>
<td></td>
<td>Principal-teacher relations</td>
</tr>
<tr>
<td></td>
<td>Decision-making structures</td>
</tr>
<tr>
<td></td>
<td>Home-school relations</td>
</tr>
<tr>
<td>Exosystem</td>
<td>Nature of the school district</td>
</tr>
<tr>
<td></td>
<td>Legislative and judicial mandates</td>
</tr>
<tr>
<td>Macrosystem</td>
<td>Conceptions of the learner</td>
</tr>
<tr>
<td></td>
<td>Conceptions of the role of education</td>
</tr>
</tbody>
</table>


Ashton and Webb (1986) followed Bandura’s (1977) theory that emphasized self-efficacy is specific to the circumstances of a teacher’s context. Not all of these factors that affect teacher efficacy will be addressed in this research, however the microsystem and macro system will provide an important role in emphasizing contextual influences of a teacher’s sense of efficacy. Within these two system levels that influence teacher efficacy, this study will focus on student characteristics, teachers’ characteristics, and teachers’ conceptions of the learner.
Teacher Efficacy and Student Characteristics

Teachers’ beliefs about student characteristics, specifically minority students and students from low SES backgrounds, may be affected by the teacher’s abilities to teach children from various cultural backgrounds. As stated by Sleeter (2001), diverse populations in a classroom contribute to the different multicultural perspectives of the students, which helps students make connections to their learning and develop awareness of their peers. However, it is challenging when teachers are not aware of students’ cultures or background. This can lead some teachers to worry about being unable to make connections with students of backgrounds that are dissimilar to their own. They may not have the knowledge or cultural awareness to address students’ needs. In order for teachers to be effective in their teaching strategies, they must have an understanding of their students’ cultural background to support scaffolding learning within the classroom (Harlin, S. B., 2009; Knoblauch & Woolfolk Hoy, 2008; Mangiate, 201).

Pang and Sablan (1998) investigated how pre-service and in-service teachers’ sense of teaching efficacy changed in teaching African-American students in their classrooms. The study included 100 pre-service and 75 in-service teachers enrolled in multicultural studies at a large university in the United States. The study revealed pre-service teachers generally had higher efficacy beliefs for working with African-American students than in-service teachers, however, the beliefs of pre-service teachers diminished once they entered into the profession and were confronted with the realities and challenges of teaching. When asked, “even a teacher with good teaching abilities may not reach many African-American students”, sixty-five percent of pre-service and in-service teachers agreed with that statement. Thus, the decline in pre-service teachers’
personal teaching efficacy may be due in part to the vicarious experiences of in-service teachers and the in-service teachers’ lack of experience and success with African-American students in their classrooms.

There are four important implications as a result of this study. First, racial attitudes from the sample of pre-service and in-service teachers does affect the beliefs that teachers hold about students, especially African-American students. Second, the majority of White American teachers that were sampled, had very few, if any, educational courses in multicultural education, and very little or no formal training or exposure to African-American cultures. Third, pre-service teachers felt more positive about their abilities to teach African-American students than in-service teachers. Some in-service teachers may be affected by negative experiences from other teachers that they then internalized. Although teachers in general feel effective in teaching students, there are still those students they believe are not teachable. Recent studies have suggested African-American teachers are successful when it comes to teaching African-American students, and these studies suggest the key element in achievement of minority students is the teacher-student relationship and supportive environment teachers create (Dilworth, 1998). Fourth, Ladson-Billings, (1994) suggest teachers “should empower students intellectually, socially and emotionally and politically by using referents to impart knowledge, skills and attitudes” (p. 18).

Again, the theoretical construct from self-efficacy that emerges from the social cognitive theory of Bandura (1986) is a critical component in understanding how teacher efficacy connects with the quality of teachers and their effectiveness in teaching students from various backgrounds. Teacher efficacy is the belief teachers’ embrace about their
own abilities to teach children from diverse cultures or backgrounds. This literature review found that teacher efficacy is an important concept that impacts student achievement and the evidence suggests that teacher efficacy is a characteristic that is relevant to the success of all students, especially minority and low SES students. Thus, general efficacy and personal efficacy are two beliefs that this study will explore in understanding how teachers feel about their abilities to teach low SES minority students.

Statement of the Research Problem Including Project Objectives

As a result of this literature review, problems have been identified among low-SES populations concerning achievement and student outcomes. Low-achievement is also evident in independent schools among low-SES populations. Within these settings, teacher efficacy beliefs, which are predictive of student outcomes (Midgley et al., 1989), are also problematic, which suggests that student achievement is suffering. Thus, in order to determine the extent to which these problems exist in the researcher’s professional context, a needs assessment study was conducted.
Chapter 2

Needs Assessment Methodology and Findings

The literature review suggests that teachers embrace beliefs about teaching through their own personal experiences, educational experiences, and observations during their professional training. Teachers’ efficacy beliefs and perceptions can shape their professional practice and mold their instructional habits with their students (Ashton & Webb, 1986; Bandura, 1977; Gibson & Dembo, 1984; Tschannen-Moran, Hoy, & Hoy, 2014). In this chapter, a needs assessment study is discussed that examined the teacher beliefs within one independent school in a northwest American state. First, the context of the study is described, followed by the method, needs assessment findings, discussion, and the alignment between research questions, data, time, and analysis.

To understand the underlying barriers that contribute to low student achievement, a needs assessment was designed to explore the factors that teachers believe can impact student success.

Description of the Context

Smith Academy is an independent school located in a major city in a northwest American state. The current student population is approximately 600 with 32 percent ethnic diversity. While the school is located in a urban setting, many students come from a variety of socio-economic backgrounds; the majority of families are from higher economic statuses. While the larger community incorporates lower and middle class statuses; many students come from a variety of socio-economic backgrounds; the majority of families being from higher economic statuses. The school’s mission is to “educate all children from diverse backgrounds to be creative thinkers through a sense of
enjoyment for learning and instill the ability to think critically and independently, while taking risks to increase their understanding of different perspectives and the backgrounds of others in a learning environment” (Smith Academy, 2016).

Smith Academy students may enter at each grade level as new students. Three to 5 students are accepted each year through a selective application process. Some students from lower socio-economic backgrounds have struggled during their academic careers and have demonstrated lower levels of academic achievement than their higher SES peers. Although Smith Academy is a successful progressive and experiential school dedicated to all students receiving an excellent education, low SES minority students have lagged behind, particularly in reading, writing, and standardized assessments. In spite of working to support low SES minority students and their families through outside resources such as social emotional counseling, and individualized academic support, many continue to struggle within this program.

As an independent institution, Smith Academy does not receive state or public funding which would qualify students who meet the criteria for Title I assistance. At Smith Academy, low socio-economic status is defined as students who receive financial assistance awards for tuition at or above 75%. Students who are ethnically, racially, and culturally diverse are students and/or parents who have self-identified by choice on their admissions applications and on their standardized assessments. Smith Academy services approximately 600 students’ kindergarten through 12th grades. The student body consists of 32% students of color, which includes, multi-racial, African-American, Latino/Hispanic, Somali, and Native American populations. Of the total student body 600 students, 19% receive financial assistance. Financial aid is awarded on the basis of
demonstrated financial need.

Smith Academy provides all students with educational resources or access to services, which can assist students with their academic learning needs. Examples of these services may include individualized tutoring and/or social emotional counseling. Both of these services are provided within the school structure as well as additional outside resources.

In spite of the additional support that many low SES minority students receive in individualized tutoring and social emotional counseling, they continue to fall behind their peers academically. Data collected from standardized assessments administered every year indicate on average 3-4 students each year fall below grade level or below 50% in reading and math comprehension. Although these students make slow progress towards the academic benchmarks at each grade level, the gap continues to widen as students move respectively up in grades. The challenge for the school’s administration is to address the barriers that many low SES minority students struggle with academically and make changes that will support students. Ultimately, if students do not make significant gains, it becomes difficult for those students to the necessary benchmarks for achieving success within the program. According to the data from the Council for American Private Education (CAPE), 2012 students that graduate from a private high school significantly increase their chances of being academically prepared for college verses high school students who graduate from other schools. Students from low SES that graduate from private institutions are four times more likely to graduate from college than their public-school counter parts (National Associate of Independent Schools, 2001). However, the number of students from low SES environments that successfully graduate
from Smith Academy continue to decline, and those that fall behind their peers struggle socially as well.

**Target Audience Stakeholders and Their Information Needs**

The audience stakeholders, for which this needs assessment is intended, is Smith Academy’s immediate administration, which is comprised of the Lower School Director and Head of School. There is a need to investigate why some low SES minority students are not succeeding academically, and how to better support them within the Smith Academy community. Students who struggle academically receive assistance from contracted tutors or tutoring agencies outside of the school. Social and emotional counseling is provided within the school, but is limited to short term intervention counseling. Additional counseling, if needed, is referred on a case-by-case basis to outside agencies. Low SES minority students who struggle with the academic program are monitored for progress, however many do not make substantial gains over the course of the school year. The concern is the attrition of low SES minority students, who are not succeeding academically. Currently, there is no additional support for students struggling academically, and eventually the students and their families are recommended to seek other schools. In order to understand the contextual problem more thoroughly, several research questions guided this needs assessment study.

**Needs Assessment Research Questions**

-RQ1: What do teachers perceive to be the academic, social/emotional, and cultural barriers to student learning?

-RQ2: What strategies do teachers report using to support students of lower socio-economic status in the classroom?
RQ3: What support (or professional development needs) do teachers perceive as important for maximizing student success in the classroom?

Method

A mixed-methods research design was used to inform the needs assessment study and support the understanding of a convergent design (Creswell & Clark, 2012). In developing the needs assessment survey, quantitative and qualitative data were used to develop this instrument and explore teachers’ beliefs and perceptions of students and variables that may be identified as barriers that affect student outcomes. The quantitative and qualitative data were used to inform the research questions and provide an overall understanding of teachers’ sense of self-efficacy and barriers that prevent student achievement.

Sample and Participant Selection

The participants for the needs assessment study included a total of 27 teachers, staff, assistants, special subject teachers, librarians, a learning coordinator, and school administrators; of this total one respondent did not complete the survey in its entirety. The survey was completed by 96.43% of the respondents. The demographics of survey participants included: 78% are credential teachers, 60% have earned master degrees, 30% have taught 5-10 years in a classroom, 31% have taught 5-10 years in an independent school, 63% have taught in public schools, 45% are between the ages of 26-35 years of age, 26% are between the ages of 46-55 years, 93% are Caucasian, 74% are female participants, and 30% are male participants.
Table 2.2.

Demographics of Survey Participants Kindergarten Through 5th Grade.

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Gender</th>
<th>Age</th>
<th>Teaching Credentials</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 (93%) Caucasian</td>
<td>20 Female</td>
<td>1 (37%) 0-25yrs.</td>
<td>21 (78%) Teacher Certification</td>
</tr>
<tr>
<td>1 (3.7%) Asian/Pacific Islander</td>
<td>7 Male (26%)</td>
<td>12 (45%) 26-45yrs.</td>
<td>16 (60%) Master’s Degree</td>
</tr>
<tr>
<td>1 (3.7%) African American</td>
<td></td>
<td>7 (25.9) 46-55+yrs.</td>
<td>6 (22%) Graduate Study</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7 (25.9%) 56+ over</td>
<td></td>
</tr>
</tbody>
</table>
Figure 2.2.

Number of Years Survey Participants Have Taught in Independent Schools

![Graph showing the number of years survey participants have taught in independent schools.]

Figure 2.2.

Number of Years’ Survey Participants Have Taught in Public Schools.

![Graph showing the number of years survey participants have taught in public schools.]

21
Instruments

Teacher Beliefs and Perceptions Survey

The 30 item Teacher Beliefs and Perceptions Survey (Appendix A) was designed to capture the extent to which teachers hold beliefs about their teaching practices, barriers teachers believe impact student achievement, professional development, and their comfort level when engaging students from diverse backgrounds. This survey was developed by the researcher for the purpose of this study. This assessment contained 25 survey questions that included demographics, number of years of teaching experience, and teaching effectiveness in the classroom. The scale measurements, using a 5-point Likert Scale, had a range from 1 through 5, with 5 being the highest response.

Procedure

The anonymous online survey was sent to 32 lower school faculty members, support staff, special subject teachers, the learning coordinator, librarians, Head of School, and Division Directors at Smith Academy. The online survey was administered through Survey Monkey on May 2, 2014 and completed on or before May 15, 2014.

The online survey instruments used were given to participants via email with a link to the anonymous survey over the course of 13 days. The respondents completed survey scale with an average completion time of 15-20 minutes. The online survey administered was accessible to the teachers, administrators, and specialist subject teachers. The participants had access to their school computer or personal computer to participate in the online survey. A one-item qualitative question was included in the self-report Likert Scale survey, which asked participants to read statements and indicate a number that best reflected their personal views about teaching.
The Likert Scale survey also included responses from a five-point nominal scale with responses ranging from strongly disagree to strongly agree. Classroom teachers, administrators, special subject teachers, the learning coordinator, librarians, Head of School, and Division Directors, were provided letters from the researcher that solicited volunteers to participate in the research study.

Needs Assessment Findings

This section reports the results from the needs assessments survey in response to the research questions.

Research Question 1

What do teachers perceive to be the academic, social/emotional, and cultural barriers to student learning?

Participants were asked to rate the barriers indicated in the statement, “rate the barriers you believe as a classroom teacher affect academic success in your classroom,” on a scale of 1 to 5 with 5 being the highest. Forty-four percent of the participants indicated they do not believe cultural differences is a barrier that affects academic success. Forty-one percent of the respondents believe student motivation and family beliefs do not affect academic success. In addition, the barriers the respondents believe have an effect on academic success include behavioral differences (e.g. ODC, anxiety, impulsivity) and attentional issues (e.g. active listening, following directions, listening to the teacher).

Research Question 2

What strategies do teachers report using to support students of lower socio-economic status in the classroom?
When asked what strategies teachers report using to meet the needs of all learners in their classroom, 77% of the respondents rated creating a climate of trust as a strategy frequently used to support all learners. Sixty-three percent also indicated providing feedback to all learners in written and oral form was a strategy frequently used to support the needs of learners. However, only 41% of the respondents display diverse cultural materials in their classrooms that represent cultural diversity, such as multicultural textbooks, literature, or posters. Thirty-seven percent of the respondents reported using strategies to connect material to students’ lives. Finally, only 34% of the respondents use culturally relevant resources and strategies to promote different viewpoints of students.

Teachers were asked to rate how often they have conversations with students in the following categories: cultural differences, responsibility to ethical differences, socio-economic differences, global differences, community differences, religious differences, and diverse family structures. Sixty-three percent of respondents indicated they occasionally have conversations regarding cultural differences as well as socio-economic differences. In contrast, 40% of the respondents indicated they almost never have conversations with their students regarding religious differences.

Teachers were asked to rank their experience in adapting teaching instructions to different groups of students; only 20% of the respondents ranked having experience adapting to diverse cultural backgrounds. Also, 25% of respondents reported having very little experience in adapting their teaching instruction to lower SES students; 75% of the respondents did not have experience working with diverse cultural backgrounds. Lastly, 68% of the respondents reported they were comfortable with adapting to middle/upper income students and less comfortable with lower income students.
Research Question 3

What support (or professional development needs) do teachers perceive as important for maximizing student success in the classroom?

In the area of professional development, 36% of respondents reported reading educational material, journals, and teaching materials, related to their subject area, 5-6 times per year, while 68% of the respondents rarely attended professional development conferences, associations, or meetings in their subject area.

Discussion

The needs assessment study provided an opportunity to explore teachers’ beliefs and perceptions about their work with students in the classrooms, their strategies to support all learners, and their level of effectiveness as a classroom teacher. The responses from the survey indicated that 49% of teachers believe they have a positive impact on students. Sixty-three percent of the teachers also believed they are effective in managing student behavior in the classrooms. In contrast, teachers said, to a lesser degree, that they occasionally have conversations about socio-economic differences and cultural differences with their students. In addition, teachers believe barriers such as cultural differences, motivation, and parent-teacher communication have little to no effect on academic success in the classroom.

While teachers have opportunities for professional development during the school year only half of the respondents attend workshops or online courses 2-3 times per year. The study also indicated a high number of respondents rarely attend professional development related to their subject matter. However, half of the teachers rely on or seek support from their colleagues to improve their lesson plans and teaching practices.
There were several limitations to this needs assessment study, including my role as the researcher; the participants know me and my beliefs about teaching students from diverse backgrounds, and my passion for advocating for low SES minority students to succeed in an independent school. While teacher beliefs and perceptions of students vary among novice teachers to experienced teachers, their experiences, exposure to diverse learners, and students from diverse cultures certainly adds to the complexity of investigating potential barriers that impact achievement for low SES minority students.

As demonstrated in the needs assessment, teachers’ responses and statements for support in professional development are substantial. Furthermore, the disconnection between the achievement of minority and low SES students and teachers’ perceptions of the barriers that impact academic success, suggests a need to explore potential solutions for why this group of students struggles academically, given that Smith Academy is a strong academic and competitive school with amply academic resources that are available to teachers and students. Teacher efficacy is the belief teachers have about their abilities to teach all students. Teachers with a strong sense of efficacy will persevere with struggling students to help them succeed. Based on the research in teacher efficacy perseverance has been recognized as a strong predictor in the academic achievement of students. (Ashton & Webb, 1986; Sleeter, 2001; Tschannen-Moran, Hoy, & Hoy, 1998a; Tschannen-Moran, Hoy, & Hoy, 1998b; Tschannen-Moran & Hoy, 2001). The need to explore a teacher’s sense of self-efficacy and their relationship with students is evident in the participants’ responses. It is important to explore teacher efficacy in this study in order to help understand the connection between efficacy, beliefs, expectations, and teaching practices as they relate to the academic output of students. Chapter 4 explores
the literature for the design of the intervention that will best support teachers in their professional development as they work with all students, especially minority and low SES minority students in their classrooms.

**Summary matrix**

Table 2.3.

*Research Questions, Data, Timeline, and Analysis*

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Data</th>
<th>Collection Timeline</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>What do teachers perceive to be the academic, social/emotional, and cultural barriers to student learning?</td>
<td>Teacher Efficacy Scale (Gibson &amp; Dembo) survey data</td>
<td>April 2016 and June 2016</td>
<td>Inductive thematic coding T-Tests</td>
</tr>
<tr>
<td>How does teachers’ sense of personal teaching efficacy change during and following an intervention?</td>
<td>Teacher Efficacy Scale (Gibson &amp; Dembo) Face-to-face sessions Survey questions</td>
<td>April 2016 and June 2016</td>
<td>Inductive thematic coding</td>
</tr>
<tr>
<td>How does general sense of teacher efficacy change during and following an intervention?</td>
<td>Teacher Efficacy Scale (Gibson &amp; Dembo) Face-to-face sessions Survey questions</td>
<td>April 2016-June 2016</td>
<td>Deductive thematic coding</td>
</tr>
<tr>
<td>What strategies do teachers report using to support students of lower socio-economic status in the classroom during and following an intervention</td>
<td>Interviews Survey questions</td>
<td>April 2016-June 2016</td>
<td>Deductive thematic coding</td>
</tr>
</tbody>
</table>
What support (or professional development needs) do teachers perceive as important for maximizing student success in the classroom during and following an intervention?

Table 2.4.

Variable, Operational Definition (s) and Valid Indicator

<table>
<thead>
<tr>
<th>Variable</th>
<th>Operational Definition (s)</th>
<th>Valid Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Current age of a teacher.</td>
<td>Self-reported item</td>
</tr>
<tr>
<td>Educational level</td>
<td>The highest level of education attained by a teacher.</td>
<td>Self-reported item</td>
</tr>
<tr>
<td>Years spent teaching in public school</td>
<td>The number of years a teacher has taught in a public school setting.</td>
<td>Self-reported item</td>
</tr>
<tr>
<td>Years spent teaching in private/independent school</td>
<td>The number of years a teacher has taught in a public school setting.</td>
<td>Self-reported item</td>
</tr>
<tr>
<td>Grade level taught</td>
<td>Grade levels a teacher has taught or is currently teaching.</td>
<td>Self-reported item</td>
</tr>
<tr>
<td>Subject areas taught</td>
<td>Subject areas a teacher has taught or is currently teaching.</td>
<td>Self-reported item</td>
</tr>
<tr>
<td>General teaching efficacy</td>
<td>General teaching efficacy is the belief and perception that a teacher will have influence over student learning despite their economic background.</td>
<td>Teacher Survey (Likert scale)</td>
</tr>
<tr>
<td>Low socio-economic status of students</td>
<td>Students who receive more than 50% financial assistance. The level of knowledge a teacher has in neuroscience education or the science of learning as it relates to student outcomes.</td>
<td>Self-report item</td>
</tr>
<tr>
<td>Knowledge about the science of learning.</td>
<td></td>
<td>Self-report item Likert scale</td>
</tr>
<tr>
<td>A teacher’s knowledge of Brain Targeted Teaching Model, Hardiman (2006)</td>
<td>A teacher’s ability to implement strategies from BTT to increase student achievement.</td>
<td>Curriculum study group Observation Reflection and feedback Survey</td>
</tr>
</tbody>
</table>
Chapter 3

Intervention Literature Review

Low SES students in independent schools often face unique barriers that make it more difficult for them to succeed academically (Arrington & Stevenson, 2003; Ascher, 1986; Cooper, & Datnow, 2000; Proweller, 1999; Garder & Miranda, 2001). Student learning is directly connected to the beliefs teachers have about their effectiveness in teaching and the amount of effort a teacher will apply with students when students are struggling academically (Gibson & Dembo, 1984; Ashton & Webb, 1986). Current research in professional development suggests teachers would benefit from opportunities to collaborate with their colleagues on subject matter and opportunities to learn and share ideas, which would support students academically in their classrooms. Research by DuFour and Mattos (2013) indicate successful learning communities for teachers focus on providing opportunities to enrich teaching practices while addressing self-efficacy in teachers.

Teacher Efficacy and Professional Development

Teacher Efficacy Beliefs

Teacher efficacy is recognized in the literature as a variable that accounts for individual differences in teaching (Gibson & Dembo, 1984). The roots of teacher efficacy come from the theoretical framework of self-efficacy (Bandura, 1977). Bandura postulated that individuals have the belief they can establish and bring about change in behavior or a change in a desired outcome. Self-efficacy is focused more on the implementation of actions that affect a desired behavior. For example, teachers who are confident exhibit high self-efficacy in their teaching abilities and increase the learning
outcomes for students. Teachers who exhibit low self-efficacy lack the skill to respond to students who are having academic difficulty and they lack the belief that they bring about change to influence a student’s behavior (Gibson & Dembo, 1984).

The methodology research from Gibson and Dembo (1984) examined the relationship of the itemized Teacher Efficacy Scale to correspond with Bandura’s theoretical model of self-efficacy. The responses from a large population of elementary school teachers indicated a strong sense of self-efficacy and further inclination to take risks in using new learning strategies to support their students. When teachers are confident in their teaching abilities they can focus additional attention on direct instructional time with students and less time on managing classroom behavior.

Through the needs assessment survey, teachers felt they were effective in managing students’ behaviors in their classrooms. However, many teachers indicated they rely on the school counselors to resolve behavioral issues with students because they lack alternative strategies to manage classroom behavior. Teachers also indicated that there is less instructional time when they have to redirect students and repeat the instructions for students who have been removed from the classroom for their behavior. Effective professional development provides teachers with tools to manage classroom behavior and increase the overall learning environment.

**Effective Teacher Professional Development**

In order for professional development to lead to improvements in teacher effectiveness, scholars should implement more precise design in the initial stages of developing professional development programs (Hill, Beisiegel, & Jacob 2014). For example, professional development programs should emphasize teachers actively
learning assessments, classroom observation of colleagues, and time for reflection. A national survey studied by Garet, Porter, Desimone, et al. (2001) suggest teachers are more skilled after receiving professional development training that involved active learning and participation. When identifying the structure of professional development programs, Borko (2004) suggest that teachers, facilitators, and the program context are key elements that are closely related to improving the quality of professional development programs. One feature Borko’s (2004) study finds important addresses professional development from the aspect of a situated perspective. This incorporates the idea that “learning should be viewed as both a process of active individual construction and a process of enculturation into the … practices of wider society” (Borko, 2000, p. 4). From this perspective, teachers can develop an understanding that the process of learning takes place in various contexts and professional development programs should follow suit and focus on teachers as learners within that process. Professional development that focuses on teaching efficacy, where teachers can place themselves in an active learning environment and integrate new skills, can increase their ability to work with struggling students in their classrooms.

A review of the literature on teachers’ professional development practices from Opfer and Pedder (2011) suggest that teachers, the school and the learning activity interact in a triadic reciprocal process. In order for learning to occur with teachers, learning must be viewed as a complex process and not a simple one-time event. The focus of professional development should emphasize providing teachers with time to develop and practice new knowledge, being supportive of their colleagues, and engaging
in the material over a sustained period of time, rather than in a brief workshop (Opfer & Pedder, 2014).

**Teacher Efficacy and Professional Development**

JohnBull, Hardiman, and Rinne’s (2013) study in professional development analyzed a control group and comparison group of teachers that received training in neuroscience and cognitive sciences utilizing the Brain Targeted Teaching framework. The comparison group completed the Teacher Efficacy Survey (Gibson & Dembo, 1984) without receiving the training. The results from this study showed that teachers trained in neurocognitive development increased the teachers’ personal and general teacher efficacy. This suggests that professional development, specifically targeted towards increasing awareness of neurocognitive development, improves the teachers’ instructional methods and connections between their students. Ross and Bruce’s (1994) study supports the concept that teacher efficacy is situational and affects the improvement of student learning. In a randomized study, Ross and Bruce (1994) researched professional development designed to provide participants in the controlled group with professional development during the fall and another sample group received professional development at the end of the study for one full day with a follow up two-hour session. Four sources of efficacy were addressed in this professional development study that are identified in the social cognitive theory (Bandura, 1977): mastery experiences, vicarious experience, verbal persuasion, and emotional state. These sources of efficacy are ways in which teachers, through professional development, can increase teacher efficacy.

Crowther and Cannon’s (2002) study focused on two groups of science teachers from K-8th grades in a public school district. The participants were given a pre-test and
post-test survey with either two-weeks intensive workshop model, or a three-weekend workshop over a three-month time frame. The result of this study indicated professional development should emphasize strong training in content and education. In addition, continuous and collaborative support from colleagues to utilize new ideas and strategies, strategies in conjunction with professional development would motivate teachers to explore different teaching practices. However, the study suggests little if any difference was noted in changing teacher efficacy in the two intensive week workshops, which is typical of common professional development models.

**Professional Development Learning Communities**

Chong and Kong’s (2012) exploratory study examined professional development learning communities. The professional development study supported teachers in an ongoing process over seven weeks; ten teachers participated from the mathematics, humanities, and science departments of a high school. The participants focused on designing lesson plans by working together, sharing ideas and concepts, creating a positive atmosphere in a structured collaborative learning environment, and working towards a common goal while overseeing the design of their lesson plans. Teachers used end of the lesson quizzes, observations of students staying on task during a lesson, anecdotal note taking on individual students, and individual conference with students based on their understanding of the tasks. The collaboration provided opportunities for teams to share what they had observed in designing the lessons, methodologies, and strategies that were used to enhance their progress. The design of this study provided qualitative findings that used a social cognitive theory framework as a means to identify teacher practices and motivational beliefs. The findings suggest that professional
development learning communities facilitate motivation that is aimed towards specific content knowledge. Further, this process and community helped develop a sense of collegiality among peers, which in turn can influence student achievement. This methodology did not explore the degree to which teacher efficacy increased or decreased in the instructional lessons but provided accounts through qualitative data of how teachers worked collaboratively. This data was collected through my direct observations as a researcher, interviews with teachers and studying how teachers engaged in collaborative group discussions.

Similarly, this dissertation study used a social cognitive theory as the framework for understanding efficacy and used The Teacher Efficacy Scale (Gibson & Dembo, 1984) as it relates to student success. The theoretical framework for the Chong and Kong (2012) intervention could also be used for professional development with teachers in the study of this dissertation intervention. A variation to this process will include teachers working across grade levels, which would give teachers more opportunity to engage with colleagues and share ideas.

Teachers develop their beliefs about teaching through their experiences of teaching in the classroom. Those beliefs can affect how teachers educate students in their classrooms including those students from different socio-economic backgrounds. Gusky (2002) reports the desired outcome of professional development is to help teachers develop changes in their classroom, explore their beliefs and attitudes regarding student success, and improve the academic outcomes for all of their students.
Classroom Behavior, Cultural Barriers, and Teacher Efficacy

Negative classroom behavior in Smith Academy is not a widespread issue, but can certainly become one when teachers take valuable time instructional time to manage their classroom. When teachers have to redirect students or persuade them to focus their attention, learning time is lost, and as a result, a student’s learning decreases. One particular area in the literature of teacher efficacy that has sparked some attention is the relationship between individual teacher beliefs with regard to classroom behavior and whether teacher beliefs are linked to actions which cause the teacher to have the student removed from class (Morris-Rothschild & Brassard, 2006; Woolfolk, Rosoff, & Hoy, 1989). One question from my needs assessment revealed 59% percent of the faculty agreed they effectively manage students’ behaviors in the classroom, and 63% also agreed they are effective in addressing behavioral issues with students in their classrooms. Yet, teachers rely on the school counselors to work with students regarding their behavior as a result of being removed from the classroom environment. Often, when students are removed from the classroom they miss the instruction or the activity and when they re-enter they do not know where to begin catching up with the lesson; or, they have to rely on another student for assistance while the teacher continues with the lesson. In these instances, there is a disconnect between the student and teacher, which then leads to a lack of communication and/or feelings of confusion for the student trying to finish the assignment. Teachers hold strong beliefs about who they are as a teacher, what they value in teaching students, and how they view themselves in the classroom with students. If a student is disruptive in class, this can lead to more energy spent focused on one student’s behavior and how to get that student to focus, than on teaching the other
students in the classroom. Teachers that rely on the same ineffective strategy of sending a disruptive student out of the classroom, may believe that is the only strategy because they have not developed other successful tools that will work with students to change or manage their behavior.

Gibbs and Powell (2012) agree with the current research that indicates teacher efficacy impacts student learning, and through their own study they further researched the complex association between teachers’ beliefs and managing children’s behavior. Their study found a correlation between teachers’ beliefs and perceptions about students, their classroom behavior, and associated disciplinary actions. Their study of 197 participants examined the participants’ their efficacy beliefs and classroom management. The results suggest a need for teachers to seek professional development, in particular classroom management, to rely less on excluding students from the classroom, and more on developing effective skills for managing disruptive behavior. The negative behavior exhibited by students were attributed to possible external influences such as negative circumstances in a student’s home environment, exposure to adverse influences within the community, family stress, social emotional factors (Becker & Luthar, 2002; Noble, Tottenham, & Casey, 2005), and cultural factors (Jensen, 2013). Gibbs and Powell’s (2012) study suggests the need for understanding teaching efficacy and strategies to assist teachers in their ability to cope with students’ behaviors in a positive manner.

There is a need for teachers to develop a sense of efficacy with respect to their students by using Culturally Responsive Teaching practices that build on teacher relationships with students in order to develop positive relationships and build trust within the classroom. The research in this article suggests using Culturally Responsive
Teaching practices to train teachers to be culturally responsive and deliver practices associated with teaching culturally diverse students (Zhou & Fischer, 2013). This article also identifies the need for teachers to actively demonstrate cultural sensitivity and to be aware of their diverse student body. Although Smith Academy recognizes the need for teachers to be aware of how learning may be affected by a student’s cultural differences, there is a disconnect between teachers’ awareness of cultural differences in students and how teachers can authentically use Culturally Responsive Teaching in their daily practices to include a student’s culture in their learning and new knowledge (Ladson-Billings, 1984).

Learning experiences that include a student’s own personal experiences reinforces the learning in the classroom and teachers who apply neuroscience and cognitive knowledge in teaching can provide further understanding of how learning occurs and the way students process information. The relevancy of neuroscience education and the intricate connection between cultural diversity and cognitive research may have the potential to increase a teacher’s ability to teach diverse students in their classrooms with strategies that not only benefit all students, but especially benefit students from low SES backgrounds (Tucker, et al., 2005). Findings from Tucker et al. (2005), suggest teachers who believe learning can be influenced by effective teaching will persevere in their teaching efforts, provide different types of feedback to support students, and will display confidence in their capacity to teach students. Tucker et al. (2005) claim research indicates African-American children and students from low SES backgrounds experience negative learning environments to a large degree, but teachers with high teaching efficacy can facilitate positive learning environments for African-American students.
It is important to note that focusing the proposed intervention with a cultural perspective will be key in finding solutions that address this issue in the professional development learning community. Much of the research for supporting the proposed intervention centers on bridging neuroscience (Dubinsky, Roehrig, & Varma, 2013), culturally responsive experience (Zhou & Fischer, 2013; Tucker et al., 2005), and teacher efficacy (Dembo et al., 1985; Gibbs et al., 2012; Tschannen-Moran, et al., 1998).

There are many professional development models for teachers that focus on new instructional practices for teachers, Culturally Responsive Teaching, or efficacy beliefs. Other professional development models concentrate on collaboration and reflection and vary widely in their format or content matter. Very few professional development models, however, address teacher efficacy beliefs, Culturally Responsive Teaching and the best practices from neuroscience and cognitive sciences, such as the Brain Targeted Teaching framework.

**Professional Development on Neuroscience and Teacher Efficacy**

The proposed intervention component that bridges neuroscience into teaching pedagogy is The Brain-Target Teaching Model (Hardiman, 2012). According to Hardiman (2012), instructional context of research about the brain development and learning through a neuro-cognition lens will assist teachers in creating lesson plans or add to their existing lesson plans. A study conducted by JohnBull, Hardiman, and Rinne (2013), compared two professional development groups over the course of two weeks. The controlled group received training in neuro- and cognitive sciences on teacher efficacy in a pre-post design. The comparison group completed the Teacher Efficacy Survey (Gibson & Dembo, 1984) and did not receive professional development
coursework. The results of this study suggest teachers who have knowledge in neuro-and cognitive science, and when given the opportunity to apply this knowledge in the classroom, show an increase in personal and general efficacy. One factor pertinent to this study is that professional development training is offered multiple times per year. Participants in the trained group had increased levels of personal teaching efficacy and higher general teaching efficacy than the control sample group. Thus, teachers applied more effective strategies in instructional methods, while improving the connections between their students. As indicated in the research, teacher efficacy is a reliable measure that reflects the beliefs teachers have. These strategies enriched the classroom instruction for all students. The collaborative model approach gave teachers the opportunity to work in partnership with other teachers to increase their knowledge about aspects in learning and brain development.

An ideal professional development workshop model incorporates teacher efficacy and addressing teacher’s perception of students who struggle academically in the school program. Key findings in the needs assessment identified barriers that teachers believe impact student outcomes. However, through indications in the research the barriers that many students struggle with, especially low SES minority students, are barriers that also tend to influence students’ learning experiences (Laureau, 2011; Tyack & Cuban; 1995; Bransford & Cocking, 2000). Thus, the professional development should address teacher efficacy and the perspectives teachers have about differences (e.g. culture, socio-economic, social, and emotional barriers) and how these differences impact the academic success of low SES minority students.
Proposed Solution

According to the literature reviewed, teacher efficacy is affected by professional development programs that are challenging and include active participation, and that is planned learning in a community with other teachers that hold shared values and vision for students. (Opfer & Pedder, 2014). Individual and collective learning through professional development improves mastery of experiences to increase teachers’ confidence in their teaching capacity and increase teachers’ efficacy (Carleton, Krockover, 2007; Cantrell & Hughes, 2008). Training over a specific amount of time increases the opportunity for the application of new knowledge and skills for teachers. Professional development models which rely on traditional methods such as one-time workshops are less effective and lack opportunities for teachers to remain committed to changes or sustain new skills. However, this Professional Development Learning Community model incorporated professional growth and collaboration with colleagues, and are embedded within the classroom to increase student learning. Within the Professional Development Learning Community, teachers followed the BTT model (Hardiman, 2012) in designing lessons and engaging in conversations with other teachers. The components of the BTT model are founded on neuroscience and cognitive science research and addressed the problems identified in the needs assessment. Further, teachers identified cultural barriers they believed affected student learning at Smith Academy. While it is not explicit, the BTT model incorporates research on low SES students and concepts such as neuromyths, neuroplasticity, and executive functioning skills, which can elicit conversations about cultural barriers.

The following research questions will be used for this intervention study:
RQ1: What do teachers perceive to be the academic, social/emotional, and cultural barriers to student learning?

RQ2: How does teachers’ sense of personal and teaching efficacy change during and following an intervention?

RQ 3: How does a general sense of teacher efficacy change during and following an intervention?

RQ 4: What strategies do teachers report using to support students of lower socio-economic status in the classroom?

RQ5: What support (or professional development needs) do teachers perceive as important for maximizing student success in the classroom during and following an intervention?
Chapter 4

Mixed-Method Study

In response to the needs assessment findings, a teacher’s belief about their ability to promote learning was identified as a variable that potentially affects student achievement. A literature review undertaken revealed many interventions exist that aim to change teacher beliefs. Among the professional development studies reviewed, evidence was presented that supports a professional development intervention aimed at influencing teaching efficacy through a Professional Development Learning Community (Chong & Kong, 2012; Carleton & Fitch, 2008) focused on the content of the Brain Targeted Teaching framework (Hardiman, 2012). The purpose of this chapter is to describe: a) an overview of this proposed intervention, b) the methodology, c) participant selection, and d) data collection and data analysis.

Intervention Overview

Professional Development Learning Community on Brain Targeted Teaching

The purpose of the Professional Development Learning Community on Brain Targeted Teaching was to enhance the work teachers do in their classrooms to support students’ academic success by impacting teachers’ efficacy beliefs. The intervention was facilitated through bi-weekly collaborative meetings with teachers to discuss the Brain Targeted Teaching framework as a curriculum study book. These meetings included opportunities for teachers to (a) discuss students of concern, (b) develop class lesson plans using the Brain Targeted Teaching framework templates as guidelines that include key concepts and strategies to emphasize each brain target, (c) collaborate with teaching partners in designing a science and literacy lesson, (d) introduce the lesson plan to the
students, (e) classroom observations, and (f) engage in personal reflections through journal and partner discussion. The study examined how self-efficacy influences teachers’ ability and confidence in their professional capacity to teach all students no matter what the challenges are for the students.

This study also sought to understand the extent to which the participants’ experiences using the Brain Targeted Teaching framework built or extended teachers knowledge in neuro-education and how the use of this knowledge informed teaching and learning.

The hypothesis is that teachers participating in the Professional Development Learning Community on Brain Targeted Teaching will report positive feelings of self-efficacy and develop stronger teaching strategies based on the Brain Targeted Teaching framework to support students’ academic success.

Methodology

Research Design

The Professional Development Learning Community on Brain Targeted Teaching intervention utilized a mixed-method study, designed to investigate changes in teacher efficacy and teacher-student relationships as a result of the professional development. Action research is identified as a tool for improving a problem involving people, tasks and procedures that require a resolution (Adelman, 1993; Cabaroglu, 2014; Adomaitiene, Zubrickiene, & Tereseviciene, 2008). This methodology employs active engagement from participants as the researchers in examining a problem collectively and while working with a researcher in finding solutions. The illustration in (Figure 4.1) describes this process of action research:
a. Identify the problem.

b. Gather data.

c. Interpret data.

d. Act on evidence.

e. Evaluate the results.

f. Revise the process to achieve results.

Figure 4.1. Action Research Framework. Adapted from McNiff, Taylor and Francis, (2013).

Action research methodology was used to examine teachers’ practices in a systematic and inquiry-based approach with a positive emphasis on changing those
practices based on the results of the research (Hine, 2013). Action research was an approach used to understand, improve, and transform teaching practices (Cohen, Manion, & Morrison, 2013). The action research methodology employed collaboration and reflection to understand the learning needs of students. Using action research and qualitative data analysis for this study emphasized what happened during the intervention process but how it happened over the cycle of the intervention (Merriam & Tisdale, 2016). Action research is designed to connect the gap between research and practice (Osterman & Sernak, 2013; West, 2011). The methodology’s focus was not just on solving the problem but also improving teacher skills, and adopted an integrated approach in understanding learning and student development. The aim was to bring about changes in the skills and roles of teachers and increased feelings of satisfaction and confidence. Action research methodology improves teachers’ ability to broaden their views on teaching and perceived learning in students. Action research was a participatory process, in which the teachers worked towards improving their own practices as researchers.

In this mixed-methods research design, both quantitative and qualitative data were collected. Data collection for this study were collected from (a) surveys, (b) individual interviews, (c) group conversations, (d) exit interviews (e) a checklist, and (f) lesson plans.

Sample, Participant Selection, Site Identification

The lower school faculty and staff of Smith Academy were invited to participate in this study. The invitation was extended to the current kindergarten through 5th grade faculty, special subject teachers, librarians, and the learning coordinator. Volunteers for
the Professional Development Learning Community on Brain Target Teaching included experienced classroom teachers with 5-20+ years of teaching in both public and private schools and one novice teacher with 1-5 years of experience in both school environment settings. Each classroom teacher has approximately 13-16 students per class. The Professional Development Learning Community on Brain Target Teaching consisted of five participants that formed the focus group for this intervention.

**Demographics of the Focus Group Participants**

The quantitative and qualitative component of this study utilized the instrument, Teacher Efficacy Scale (Gibson & Dembo, 1984), and was completed by 5 voluntary participants in the Professional Development Learning Community at Smith Academy. The focus group component of this study was comprised of five participants that participated in the Professional Development Learning Community on the Brain Targeted Teaching framework. The demographics of the participants who responded to the Teacher Efficacy Survey are as follows:

- Participants in the pre-survey and post survey are experienced teachers with the exception of one teacher who has teaching experience within the range of 1-5 years and is considered a novice teacher.
- Four of the participants have taught in grades Kindergarten-12, with the exception of one teacher who has experience in only Kindergarten-5th grades.
- Two of the participants are age 51+ years of age, one teacher in the range of 41-50 years of age, one teacher in the range of 31-40 years of age, and one teacher in the range of 20-30 years of age.
- Four of the participants are females and one male.
All participants are Caucasian.

Three participants have MA degrees, one has some post graduate education, and one has a Doctorate degree.

Only one participant does not have a teaching certification.

**Instruments and Measures**

The instruments and measures were described in this section of the paper. They included the Teacher Efficacy scales (Gibson & Dembo, 1984), the Brain Targeted Teaching implementation checklist (Hardiman, 2012), classroom lesson plan templates, and the Brain Targeted Teaching plan and preparation template (Hardiman, 2012).

**Teacher Efficacy Scales**

The instrument used in this study was the Teacher Efficacy Scale (Gibson & Dembo, 1984), which can be found in Appendix A. The Teacher Efficacy Scale is a 14-item survey that measures personal teaching efficacy and general teaching efficacy. This survey asked teachers to identify expectations about teaching and influence over students and whether teachers believe in their own abilities to produce change with students.

**Brain Targeted Teaching Implementation Checklist**

The BTT implementation checklist found in Appendix B provided a guideline for participants to self-assess during instruction (Hardiman, 2012, p. 190). This provided additional information captured for each target area during the delivery of the lesson plan. These implementation checklists were used to collect observational data by the researcher for classroom observations. This data included in the qualitative data were analyzed, read, and recorded using a Livescribe/Echo pen. The Livescribe pens were used during the collaborative meetings, classroom observations of lessons, and reflection sessions.
Classroom Lesson Plans Template

The lesson plan template found in Appendix C provided teacher notes for observations while delivering the lesson plan. This also included teacher reflections for discussion during the bi-weekly collaborative. Collaborative discussions included in the qualitative data were recorded using a Livescribe/Echo pen.

Brain Targeted Teaching Planning and Preparation Template

The template in Appendix D was adapted from the Brain Targeted Teaching framework (Hardiman, 2012, p.185) as a rubric for the research and teachers to follow on meeting targeted goals based on the literacy and science lessons developed by teachers. The teachers used this template during their collaborative discussions as they designed the lesson plan. These templates served as another source for the qualitative data analyses.

Procedure

This section discusses the steps of intervention, data collection, and data analysis for the Professional Development Learning Community on Brain Targeted Teaching intervention.

Intervention Procedure

Participant teachers in the curriculum study group took part in the activities of the Professional Development Learning Community and used the Brain Targeted Teaching framework (Hardiman, 2012). Each presentation given by the researcher included the foundation for understanding brain development, neuromyths, and four of the six brain targets: (a) developing the emotional climate in the classroom, (b) the physical environment and, (c) the learning design, and (d) teaching for mastery. The remaining
two brain targets were not included in this study due to the limitation of time. The participants involved in a Professional Development Learning Community read and discussed each chapter in a face-to-face group and explored how to use the Brain Targeted Teaching framework in conjunction with classroom instructions.

As the researcher, I gathered evaluation responses that were included with the qualitative data. The descriptive statistics provided a snapshot of the focus group participants in this intervention and their responses were reflected in each research question. The quantitative data provided an analysis of the survey questions that were then compared with the focus group data, which was provided by their pre-survey and post-survey responses. While the sample size was small, it provided valuable research on teacher efficacy and on how neuroscience can be implemented as part of the academic structure that enhances and improves student learning. The quantitative data research was highlighted for trends, and descriptive analyses were used to describe the participant’s experiences using the Brain Targeted Teaching framework. I analyzed the results of this study, the themes that emerged from the participants, and the descriptive analyses in providing the results.

During each session, teachers developed lesson plans to include neuro-education based research strategies and implemented them into the classroom instruction. The qualitative questions that were added on to the Teacher Efficacy Survey asked participants to describe the ways in which they planned classroom instruction to capitalize on their students’ cultures and experiences and described the ways they planned for cultural differences in their classrooms. Teachers created lesson plans for primary and secondary grades that incorporated research-based strategies suggested for
designing a positive emotional climate in the classroom for students. Teachers had the opportunity to analyze lesson plans and strategies from the Brain Targeted Teaching framework through collaborative meetings within each grade. In addition, participants were asked to include cooperative groups of students for small group instruction and/or pairing of students for the science and literature lessons and assignments. Teachers used the current model of collaborative faculty/staff meetings to provide academic and behavior updates on students in the classroom. The collaborative meetings served to bring together grade level teachers during biweekly meetings to discuss student updates.

In addition to the collaborative meetings, teachers in the focus group designed their lesson plans using the Action Research methodology to support and enhance students’ ability to learn. The teachers met bi-weekly with the researcher for 45-minute sessions. The researcher took notes using a Livescribe/Echo pen, recorded responses and discussion points, including brainstorming ideas and topics of discussion.

The researcher collected classroom observations of students and teachers. This data was collected for the purposes of gaining understanding of how the teachers interacted with students and how the students participated with each other during the instruction of the lesson. The researcher included classroom observations as part of the data collection process. The classroom teachers took notes on the students’ progress and noted any changes in student learning.

An exit interview was administered to teachers using the interview questions and their responses recorded using a Livescribe/Echo smart pen technology.

**Science and Literacy Lesson Plans**
Science and literacy lesson plans were used for the Brain Targeted Teaching during the collaborative session. These two content areas were used as lesson plan models because of their commonality structure and simplicity that could be applied to primary grades to increase the skill level for secondary grades. The lesson plans were structured by the teachers during their initial collaboration. The description of the science and literacy lesson plans are described in Table 7 and Table 8. The strategies within each Brain Target One, Two and Three and Four guided teachers on instructional strategies to incorporate into the literacy and science lesson plans. Teachers utilized the Brain Targets to connect more with students, create a more inclusive learning environment, engage students in the lesson plan, and offer more academic support for students by breaking down the lesson into manageable parts for students who were struggling with the concepts. The Brain Targeted Teaching and Planning template served as a rubric for teachers to adapt the lesson plans for students.

Together the teachers designed the lesson plans in literacy and science instruction. The teachers brainstormed ideas for the lesson plans. This activity was a pair and share with the researcher taking notes on the collaboration. Teachers wrote up their lesson plans with the opportunity to introduce it to their respective students the following week. Once the lesson plan templates were established the participants were led through the sessions and corresponding Brain Targets. Table 7 depicts the literacy lesson introduced to students for the purpose of this intervention, keeping in mind suggestions, strategies, and applied exercises from the Brain Targets.
Table 4.1.

**Literacy Lesson 1**

<table>
<thead>
<tr>
<th>Lesson Objective:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The unit begins by connecting students’ prior knowledge to today’s lesson. This provides students with context to help introduce the new learning goals. Students learn a song with the spelling of the students’ name to build awareness of sounds and how to manipulate sounds. The songs often feature repetitive tunes to help students remember the songs and the spelling of each student’s name.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Challenges:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Meeting the individual learning needs of kindergarten students.</td>
</tr>
<tr>
<td>• Recognizing their differences.</td>
</tr>
<tr>
<td>• Physically active students require multiple breaks in between lessons.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Target Areas:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The classroom builds community relationships and early reading strategies.</td>
</tr>
<tr>
<td>• Students learn to recognize peer’s names and the peers themselves.</td>
</tr>
<tr>
<td>• Name celebrations link drawings of familiar people and places to words.</td>
</tr>
<tr>
<td>• Students practice drawing representational pictures of their peers and write the student’s name.</td>
</tr>
<tr>
<td>• These foundational print concepts prepare students to later sound out words and phrases on their own.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Brain Target Areas and Lesson Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Using the BTT 1 model to create a safe environment for learning, teachers recognize the connection between emotions and learning and what contributes to optimal student learning.</td>
</tr>
<tr>
<td>• Teachers establish a safe environment by meeting individually with students, getting to know them and establishing a routine of classroom activities.</td>
</tr>
<tr>
<td>• Students begin to take ownership in their learning by introducing stamina and independence.</td>
</tr>
<tr>
<td>• Students learn about their peer’s differences and teachers acknowledge those differences as uniqueness of each student.</td>
</tr>
<tr>
<td>• Shared differences are seen in stories during reading, peer names, and students re-telling of personal experiences.</td>
</tr>
</tbody>
</table>
Evidence of Success Using the Brain Targeted Teaching Method to Increase Student Learning:
- Teachers connected more with students individually.
- Increase in student participation.
- Increase student engagement and motivation.
- Demonstrate understanding of the organization and basic features of print. Develop printing concepts.
- Recognizing spoken words that are represented in specific sequences of letters.

Table 4.2 Represents the science lesson introduced to students for the purpose of this intervention, keeping in mind suggestions, strategies, and applied exercises from the Brain Targets.

Table 4.2.

Science Lesson 2

Lesson Objective:
- Use the BTT 3 model to design the learning lesson for students using visual, graphic organizers and graphic maps for the unit of study.
- The BTT 3 emphasizes the use of establishing the “big picture” for students and increase a deeper understanding of the science unit and further encourage students learning connections to other concepts
- Using BTT 4 methodology promotes mastery of this unit. The teacher has designed this unit keeping in mind the strategies for long term memory and short term memory.
- This lesson uses a variety of strategies such as mnemonics, chunking and interleaving as memory aides.
- Art is included in this lesson to give students an opportunity to use other means of retaining knowledge from this lesson and employ creativity with their own analogies of black boxes.

Challenges:
- Meeting the individual learning needs of 4th and 5th grade students.
- Recognizing their different socio-economic backgrounds, blended families, same-sex parents and divorced parents.
- Five students struggling academically who are below grade level achievement.
- Two students who are bi-lingual.

Target Areas:
- In fourth and fifth grade, students expand their scientific understanding of systems to explore how parts within a system connect and work together.
- Students study the hierarchy of systems to find connections between these systems and subsystems.
- Students learn how the parts within a system work together to make a whole using a black box model.
- Students will collect, present, and interpret data to summarize their results.
- Students collaborate in groups and communicate their ideas to arrive at a consensus.
- These skills prepare students for planning and implementing investigations later in middle school. Building a conceptual model will challenge students to discover what the inside of the black box looks like without looking inside.
- Prepares students to build a physical representation of their black box later in the unit.

### Brain Target Area and Lesson Objectives
- The BTT 3 model is designed to facilitate the lesson for students using visual, graphic organizers and graphic maps for the unit of study.
- BTT 3 emphasizes the use of establishing the “big picture” for students and increase a deeper understanding of the science unit and further encourage students learning connections to other concepts.
- BTT 3 encourages retention and comprehension of learned concepts.
- The BTT 4 methodology promotes mastery of this unit.
- This unit models strategies for long term memory and short term memory.
- This lesson uses a variety of strategies such as mnemonics, chunking and interleaving as memory aides and repetition
- Art is included in this lesson to give students an opportunity to use other means of retaining knowledge from this lesson and creativity with their own analogies of black boxes.

### Evidence of Success Using the Brain Targeted Teaching Method to Increase Student Learning:
- Using concrete tools and working in pairs helps scaffold student learning.
- Students become more confident and independent in their investigation and exhibit more divergent thinking strategies.
- Use of multi-sensory activities to promote learning.
- Utilizing visual organizers increases comprehension and provides the big picture of what students are learning.
- Writing in science notebooks offers students a chance to think more deeply about their scientific process, which reinforces learning goals and supports students’ voice.
Introduction Session:

The researcher introduced The Brain Targeted Teaching Model to the Curriculum Study Group of teachers who volunteered for this study. The researcher presented: “Separating Neuromyth from Neuroscience,” from the Brain Targeted Teaching Model, Hardiman (2012). This introduction session focused on: Neuromyths in education, themes from neuro-cognitive sciences, and brain structure and function. This introduction session lasted 45 minutes, participants took notes, asked clarifying questions, and discussed their knowledge of neuroscience. After the Introduction Session, the teachers read pages 1-32 of The Brain Targeted Teaching Model provided by the researcher.

Session One:

The researcher introduced Brain Target One: Establishing the Emotional Climate for Learning to the teachers the first week after the introduction. The session lasted 45 minutes. The researcher presented a Power Point presentation on the Brain Target- One: Establishing the Emotional Climate for learning. Teachers collaborated in the focus group to design a science and literacy lessons based on Target One that highlighted research based strategies. The participants discussed students to pay particular attention to as those students were identified as struggling academically in their classroom. After the Session One, the teachers read pages 33-58 from The Brain Targeted Teaching Model, (Hardiman, 2012) which was presented by the researcher.

Session Two:

The following week the researcher introduced Brain Target Two: The Physical Environment. The session lasted 45 minutes. The researcher presented a Power Point presentation on Brain Target Two: Creating the Physical Learning Environment. The
teachers discussed with their partner how the environmental features of a classroom affected attention and learning. Teachers paid particular attention to the structure and layout of their own classroom, kept in mind the lighting, classroom order of materials, access to learning materials, and the overall appearance of the classroom. After Session Two, the teachers read pages 58-78 from *The Brain Targeted Teaching Model*, (Hardiman, 2012) which was presented by the researcher.

**Session Three:**

The researcher introduced Brain Targeted Three: Designing the Learning Experience. The session lasted 45 minutes. The researcher presented a PowerPoint presentation on the Brain Target Three: Designing the Learning Experience. The teachers began discussions on the literacy and science assignment from the first session and made changes that were discussed during this chapter. The focus on the lesson plans included using tools to help students focus and organize their thoughts. This unit paid particular attention to learning goals, objectives and graphic organizers to help students understand the big picture ideas for the literacy and science lesson plan. After the Session Three, the teachers read pages 78-94 from *The Brain Targeted Teaching Model*, (Hardiman, 2012) which was presented by the researcher.

**Session Four:**

The researcher introduced Brain Targeted Four: Teaching for Mastery of Content, Skills and Concepts. The session lasted 45 minutes. The researcher presented a Power Point presentation on the Brain Target Four: Teaching for Mastery of Content, Skills and Concepts. The teachers discussed incorporating an art medium into the science and literacy lesson plans. Teachers shared ideas of incorporating different types of memory
strategies, developing ways to include pictorial representations for students, and strategies for reinforcing more challenging concepts by using elaboration to enhance memory. After the Session Four, teachers read pages 95-124 from *The Brain Targeted Teaching Model*, (Hardiman, 2006) which was presented by the researcher.

**Data Collection – Quantitative and Qualitative**

Throughout this intervention, it was important to assess and monitor the academic progress, if any, of students in the classrooms. This was obtained via formal assessments from the lesson plans, conferencing with individual students, student group work, and classroom observations. Monitoring student progress was a required component of the intervention.

**Data Collection Procedure**

The Teacher Efficacy Scale (Gibson & Dembo, 1984) was given prior to the intervention and after the intervention to the participants in the Professional Development Learning Community. At the end of the intervention teachers were asked to participate in an exit interview which provided more opportunity to gather anecdotal information. The researcher recorded their responses associated with beliefs teachers hold regarding learning, student learning, diverse students, and their teaching experiences

**Main Topics Covered**

1. Neuromyths, the brain structure and function
2. Developing the emotional climate in the classroom
3. The physical environment
4. The learning design
Survey

The Teacher Efficacy survey results were collected prior to the introduction of the intervention during April. The survey was given at the conclusion of the last presentation and results collected on July 2016 using an online survey provider, Survey Monkey. Both surveys were administered online and participants completed the survey on a personal computer or school computer.

Interviews

The exit interviews were conducted in June 2016 with all participants from the focus study group. The exit interviews consisted of face to face meetings in a private office. The exit interview questions can be found in Appendix E. As the researcher, I conducted the interviews privately with each participant from the study group which took approximately 30 minutes each to complete using a Livescribe/Echo smart pen to capture audio recordings for the analysis.

Reflection

The Professional Learning Development Community on Brain Target Teaching provided time for reflection inquiry and discussion within the focus group study and explored how the lesson plans met the needs of students in their respective classes. This occurred during every collaborative bi-weekly meeting. During the collaborative sessions with teachers I recorded changes made to the lesson, gave feedback for improvement of the lesson plan, and noted students’ responses to the lesson, as well as any reflections on discussions between the focus group participants and myself.

These collaborative sessions occurred bi-weekly and each grade level teacher met with the researcher for debriefing, and sharing and analyzing what strategies worked well
or did not work well with students, paying particular attention to students of concern. This provided a closer look at how specific interventions from the BTT model worked for individual students. By closely monitoring student progress, students received more feedback and guidance from their teachers.

**Data Analysis**

A convergent design within a mixed-methods approach was used to compare and contrast quantitative statistical results with qualitative findings. The analyses of the results were analyzed concurrently at the completion of the intervention. The data from both sets were merged into the analysis and interpretation to examine themes established from the participants’ findings or participants’ beliefs and perspectives (Creswell, 2014).

**Data Management Plan**

All electronic survey data and qualitative responses were kept on a password-protected document on the researcher’s password protected computer. All names of participants were stripped from the surveys and identification numbers were assigned to each participant. A separate document linking participants’ names and identification numbers were kept for the duration of the study and were password protected on the researcher’s computer and in a locked cabinet in the researcher’s office. All participants were assigned an individual number when they completed the survey which was then stored in a password protected computer. Notes, observations and reflections were stored in a locked file cabinet in the researcher’s office.

**Qualitative Data Coding**

Deductive coding methods were used to identify patterns within the text responses that confirmed or supported teachers’ self-reported beliefs in the surveys. The four kinds
of qualitative data analyzed included: 1) open-ended survey questions, 2) interview questions from face to face sessions, 3) field notes and observations and 4) reflection notes. The data were analyzed using a deductive coding process (Saldana, 2013). The data were coded and labeled for thematic analysis and were described as themes from the data (Saldana, 2013).

**Summary matrix**

Table 3.1.

*Research Questions, Data, Timeline, and Analysis*

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Data</th>
<th>Collection</th>
<th>Analyze</th>
</tr>
</thead>
<tbody>
<tr>
<td>What do teachers’ perceive to be the academic, social/emotional, and cultural barriers to student learning?</td>
<td>Teacher Efficacy Scale (Gibson &amp; Dembo) survey data</td>
<td>April 2016 and June 2016</td>
<td>Inductive thematic coding</td>
</tr>
<tr>
<td>How does teachers’ sense of personal teaching efficacy change during and following an intervention?</td>
<td>Teacher Efficacy Scale (Gibson &amp; Dembo) Face-to-face sessions Survey questions</td>
<td>April 2016 and June 2016</td>
<td>Inductive thematic coding</td>
</tr>
<tr>
<td>How does general sense of teacher efficacy change during and following an intervention?</td>
<td>Teacher Efficacy Scale (Gibson &amp; Dembo) Face-to-face sessions Survey questions</td>
<td>April 2016-June 2016</td>
<td>Deductive thematic coding</td>
</tr>
<tr>
<td>What strategies do teachers report using to support students of lower socio-economic status in the classroom during and following an intervention</td>
<td>Interviews</td>
<td>April 2016-June 2016</td>
<td>Deductive thematic coding</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Survey questions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What support (or professional development needs) do teachers perceive as important for maximizing student success in the classroom during and following an intervention?</th>
<th>Interviews</th>
<th>April 2016-June 2016</th>
<th>Deductive thematic coding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Survey questions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Evaluation Questions**

Each of the evaluation questions were addressed within each of the research questions.

Table 4.3 provides a summary matrix for the questions.

1. Describe the changes you saw in your students after delivering the Brain Targeted Teaching lesson plans.
2. Describe the most salient aspects of teaching the Brain Targeted Teaching method.
3. What are the highlights you feel are most important from the Brain Targeted Teaching method that you will continue to use?
4. Describe how this intervention has helped your students overall.
5. Describe how this intervention has changed your teaching instruction.
6. Describe how this intervention could be improved.
Table 4.3.

_Evaluation Questions, Data, Timeline and Analysis_

<table>
<thead>
<tr>
<th>Evaluation Questions</th>
<th>Data</th>
<th>Collection Timeline</th>
<th>Analyze</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe the changes you saw in your students after delivering the Brain Targeted</td>
<td>Observations, notes, discussions</td>
<td>April 2016-June</td>
<td>Deductive thematic coding</td>
</tr>
<tr>
<td>Teaching lesson plans.</td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>Describe the most salient aspects of teaching the Brain Targeted Teaching method.</td>
<td>Observations, notes, discussions</td>
<td>April 2016-June</td>
<td>Deductive thematic coding</td>
</tr>
<tr>
<td>What are the highlights you feel are most important from the Brain Targeted Teaching</td>
<td>Observations, notes, discussions</td>
<td>April 2016-June</td>
<td>Deductive thematic coding</td>
</tr>
<tr>
<td>method that you will continue to use?</td>
<td></td>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>Describe how this intervention has helped your students overall.</td>
<td>Observations, notes, discussions, interviews</td>
<td>June 2016</td>
<td>Deductive thematic coding</td>
</tr>
<tr>
<td>Describe how this intervention has changed your teaching instruction.</td>
<td>Observations, notes, discussions, interviews</td>
<td>June 2016</td>
<td>Deductive thematic coding</td>
</tr>
<tr>
<td>Describe how this intervention could be improved.</td>
<td>Observations, notes, discussions, interviews</td>
<td>June 2016</td>
<td>Deductive thematic coding</td>
</tr>
</tbody>
</table>
Chapter 5

Results and Discussion

The purpose of this dissertation was to examine teachers’ feelings and beliefs about their abilities to teach students from different cultures, and various socio-economic backgrounds, before and after a professional development on the Brain-Targeted Teaching framework (Hardiman, 2012). This study also ascertained the degree to which participants in the focus group using the Brain Targeted Teaching Method, encouraged teachers’ understanding of neurocognitive education and how it informed their teaching practices. In Chapter 4, I presented the research design of the Professional Development Learning Community on the Brain Target Teaching framework. In addition, this study examined how teacher self-efficacy beliefs influenced teachers’ confidence and their ability to teach all students in the classroom, especially low-SES minority students who were struggling to succeed academically. This study also examined the ability to understand and utilize neuro-education in classroom instruction to extend teaching practices and further enhance learning for students. The goal of this chapter is to provide the quantitative and qualitative analysis of data collected with the aim of addressing each of the research questions listed below:

RQ1: What do teachers perceive to be the academic, social/emotional, and cultural barriers to student learning?

RQ2: How does teachers’ sense of personal and teaching efficacy change during and following an intervention?

RQ 3: How does a general sense of teacher efficacy change during and following an intervention?
RQ 4: What strategies do teachers report using to support students of lower socio-economic status in the classroom?

RQ5: What support (or professional development needs) do teachers perceive as important for maximizing student success in the classroom during and following an intervention?

Due to the nature of the data analyses, the presentation of Research Question 4 will be embedded in the vignettes and descriptions reported in Research Questions 2 and 3. I describe how teaching efficacy beliefs changed or remained fixed within those questions, and I also delineate how practices associated with those beliefs changed or were sustained.

**Overview of the Teacher Efficacy Scale and the Research Questions**

Teacher self-efficacy is the belief teachers have about their abilities and skills as educators (Gibson & Dembo, 1984). Research on teacher self-efficacy was shown in Chapter 4, to be an important characteristic of a teacher’s competence and strongly related to the academic success of students. The Teacher Efficacy Scale was used to gather data from teachers on their personal teaching efficacy and general teaching efficacy. The results gathered from the research questions provided the descriptive data from the participants and their experiences during and following the intervention. The data were analyzed using EXCEL spread sheets and coding processes to correspond to the research questions during the analysis phase.

**Themes**

The following themes emerged from the qualitative data and were explored within the results of the research questions.
Theme 1: How to engage and motivate students in their learning.

Theme 2: Understanding environmental influences that affect student learning.

Theme 3: Reinforcing new knowledge.

Theme 4: Cultural awareness.

These themes emerged from the qualitative data through meetings, interviews one-on-one discussion, observations and reflections. The themes arose from the research questions and highlighted with the descriptive data from the participants in this study. The process of coding the qualitative data followed the analysis steps described below.

1) Written transcripts were read and brief notes taken.

2) Notes were made in the margins and list the different types of information found.

3) Lists were made with descriptions according to themes that emerged.

4) Identification and linked categories were listed as major themes and/or minor themes.

5) Compare and contrast between various major and minor themes revealed connections between the data.

6) The themes were read and re-examined each in detail.

7) Once all the transcript data were categorized into major and minor themes, they were reviewed for accuracy and to ensure all of the data were analyzed.

8) The themes were analyzed, compared and reviewed with each of the brain targets and categorized according to the themes and the data collected.

9) The themes were categorized and recorded according to each of the brain targets presented to the participants in the focus group.
Research Question 1

What do teachers perceive to be the academic, social/emotional and cultural barriers to student learning?

The first research question focused on the teachers’ perception of barriers to student learning. The focus group participants identified barriers they believed impacted student learning through their discussions. These barriers were generated during their discussions and reflections about their classroom make-up of students from different levels of socio-economic status and diverse cultures.

Participants in the focus group discussed students in their individual classrooms in order to gain a wider perspective on what types of support students needed for optimal learning that encouraged their social and emotional growth. Each participant selected students from their classrooms to target for supporting academically using the BTT-based strategies, and they monitored their progress during the intervention as well. The focus group identified students that were struggling academically based on classroom observation, quiz and test scores, classroom participation, one-on-one assessments given by teachers, and engagement with their peers in cooperative learning groups. Students of the participants were comprised of primary and secondary grade levels and included those receiving additional tutoring or students receiving social and emotional counseling.

To best understand the barriers that teachers perceived influenced student learning, the participants in the intervention were asked to reflect on their students in their classroom. The reflection questions were formulated to initiate conversations with the participants. The following were the reflection questions:

1) Describe some of your challenges with students in your classrooms.
2) Share your moments of success that you have had with your students about their learning.

3) Share your moments of success with the students in your classroom. The reflection time for the teacher participants occurred after the delivery of each introduction of The Brain Targets.

The reflection time gave teachers the opportunity to share their notes and ideas as they participated in each of the sessions. I identified the reflection time as a chance for the participants to express themselves freely in a safe environment to discuss concerns regarding student learning, or experiences in the classroom with students. The reflections times were also in alignment with the Diversity Talks that are described in Chapter 4. The purpose of the Diversity Talks was to extend to teachers a safe place to discuss topics of their choice, and meet with their colleagues across the grades outside of the regularly scheduled faculty and staff meetings. I led the monthly discussions with teachers who participated on a voluntary basis. Two of the focus group members were also regular attendees in the Diversity Talks. The two focus group participants shared their perspectives and insights during the reflection times with the other participants throughout the intervention regarding classroom management, creating a challenging curriculum for students, connecting their curriculum to global experiences. These conversations were also captured and shared in the focus group participant discussions.

The barriers in learning were chosen by the focus group participants and identified as those that critically affected the learning achievement of students. The main barriers identified were:

- How to Engage and Motivate Students in their Learning.
• Environmental Influences that Affect Student Learning.
• Reinforcing New Knowledge
• Cultural Awareness.

These barriers were identified after the delivery of the introduction session of The Brain Targeted Teaching Model. During the reflection time teachers discussed what they learned during the introduction session that covered topics such as neuromyths, brain structure and brain functions. Teachers also took notes during the induction session and share their notes with each other. The teachers discussed challenges they were having in their classrooms with students and how those students were struggling academically and having behavior problems. From their discussions they agreed on the following themes that affect student learning.

**How to Motivate and Engage Students in Their Learning**

Teachers find it difficult to engage students in learning when they become distracted or are not following directions. Teachers found that when students are not engaged in their learning, they often do not complete the in-class assignments and have difficulty focusing, which results in their negative behavior with peers in the classroom. Their lack of motivation affects their learning outcomes. Mary describes one of her students:

> Johnny is a very bright student but he often likes to do what he wants to do in the classroom. When he’s on task (which isn’t often) he’s great. But, when he’s off task, his behavior gets him into a lot of trouble. I’m not sure what will motivate him, if anything...
Teachers often described students as bright, however they were also a distraction in the classroom when they did not pay attention or when they were distracting other students. Teachers wanted this behavior to stop and did not want other students engaging in the same behavior. When this happened, the teacher felt a loss of control over the entire class and might remove the student from the classroom as a means of managing the behavior of the class. When students were off task it was difficult for teachers to engage the students because they did not have the proper skills or techniques to use with students to get them to refocus. Teachers became impatient with this type of behavior and showed less interest in finding ways to motivate or engage these particular students. This example exemplifies a teacher who was unsure of her abilities to motivate and engage a student. Thus, the student was often the one blamed for distracting other students and disrupting the class.

Environmental Influences That Affect Student Learning

The physical environment of the classroom is important and sets the stage for learning (Hardiman, 2012). The access students had to classroom materials and the ability to flow from different working groups increased students’ attention. When given the right physical environment students could transition easily between working independently and in their cooperative groups. Being able to work without distractions in a well-lit and inviting learning environment increased learning and stimulated creativity. Carol shared this:

*I like to begin each new school year with a theme that introduces what I want the students to learn. I have a lot of visuals on my walls and use the outside of the hallways too. I like the flexibility of designing more inviting spaces to learn and*
work with my students. I try to include birthdays, photos of the students’ families, different types of foods, etc....

The teachers had control of the physical layout of their classroom, however one aspect that they all agreed hindered the physical environment were the white boards. White boards were cited as a barrier to learning because the teachers had no influence as to where they were placed within the classrooms. As a result, they had to close the blinds and block out the natural light in order for students to see the screen. Teachers felt constrained by the whiteboard addition to the classrooms and how it negatively affected their ability to alter their learning space. In addition, students who had difficulty focusing in class, chose to sit on the perimeter of the classroom layout, which further inhibited their ability to concentrate.

The emotional learning environment is established when students feel part of the learning community with their peers and have developed a positive and trusting relationship with their teachers (Hardiman, 2012; Hart & Albarracin, 2009; Pekrun, Goetz, Frenzel, Barchfeld, & Perry, 2010). The emotional climate reinforces learning and the connections between students and their teachers. When students have encouraging and ongoing relationships with their teachers, they adapt better socially and have greater academic ability (Jones, Bouffard, & Weissbourd, 2013; (Mashburn, et al., 2008). Conversely, when students and teachers have conflicts or have negative relationships, students are less engaged in their learning, which may result in low achievement (Hamre & Pianta, 2005) Teachers who were efficacious in their beliefs about students and their teaching abilities developed their skills in making connections with students and providing an environment that students could engage in academically to increase their
knowledge, and learn to develop emotionally and socially with their friends. For example, Susan described her beliefs about the emotional connections:

*It’s important for teachers to model the behavior we expect to see in our own students... openness, kindness, acceptance, tolerance, compassion, and guide students to embrace the world.*

Some teachers who were connected with their students on an emotional level focused on getting to know as much as they could about the student in their classroom. These teachers worked towards understanding the strengths and challenges of the students while setting the foundation for students to explore and take risks in their learning. Teachers developed their relationships with their students by engaging in the same behaviors they expected to see in their students. Behaviors such as kindness, respect and empathy that Susan found important. This was primarily true for the focus group participants in this study; their behaviors did not align with their beliefs, for working with low-SES minority students.

While the quote above indicates the teacher’s desired behavior for their students to model, and their desire to develop a strong relationship with students. Even though they described these positive beliefs, teachers still struggled in establishing deeper connections with students, especially when those students were low-SES minority students who had academic challenges.

**Reinforcing New Knowledge**

Reinforcing knowledge occurs when teachers find ways to include a student’s prior knowledge with new knowledge. Reinforcing knowledge is important because it helps students build upon current curriculum and continue to make academic growth
(Karpicke & Rordiger, 2008; Hardiman, 2012). Reinforcing new knowledge occurred when students could identify concepts through scaffolding the learning and developing their short term and long term memory. Understanding how to help students make connections between new material presented and previous learned material can be achieved when teachers adjust their curriculum to meet the needs of all learners. Margaret shared how she tried to reinforce learning:

*After I give the instructions of my lesson, I try to conference one-on-one with students. Initially, the (struggling) student seemed to understand the concepts but when I sat down with them one-one one they had difficulty articulating what they had learn. I’m not sure if they really understood the lesson or not.*

In this example, some of Margaret’s students struggled with the literacy lesson this teacher introduced. Margaret found it difficult to help students remember material after the lessons were initially presented. Even when she would meet with students one-on-one, she was unsure whether the student understood the content, and the teacher did not understand why academically challenged students could not comprehend the material, or how to better help them.

Another technique a teacher used to help students retain more information was for students to share their ideas in front of the class. Teachers typically start with a prompt that would elicit a response from students to describe or talk about their observations in detail and recall the content introduced in the lesson. Many students raised their hands to volunteer their knowledge while other students sat quietly and thought of an answer. The teachers have described this as a routine that happens more than once or twice during the day. Teachers wanted students to be prepared to express their ideas in front of their peers.
Often, teachers did not recognize when they were impatient with students who took more
time to think of an answer. When a student could not come up with an answer as quickly
as others, the student felt embarrassed, and the teacher moved on to call on another
student. This statement was typical of a teacher that gave up too quickly with a student
who might have required more prompting to feel secure about sharing their ideas in front
of the class. Mary described her experience with her students:

*I give students a chance to talk in front of the other students, but they just kind of
shut down. I don’t want them to be embarrassed because they don’t know the
answer but I also don’t want to give them any prompts because I don’t give the
other students prompts. I have tried to give them opportunities in the classroom
by sharing with each other, but this doesn’t seem to work.*

Students felt isolated or embarrassed when they did not have the answer when called
upon. This teacher continued to use the method of calling on a student to reinforce their
learning but the student felt embarrassed and did not want to stand out and without
knowing the answer. Students who struggled and felt embarrassed had a difficult time
engaging with teachers for fear of being put on the spot again. The teacher believed this
was a good method that worked with most of her students, but she lacked awareness of
recognizing that some students were shutting down and becoming embarrassed in front of
their peers. The student’s confidence level diminished and as result, the student was not
focusing and continued to avoid tasks or instructions from the teacher.

**Cultural Awareness**

Teachers who exhibit high personal teacher efficacy rely on their experiences and
knowledge to tackle difficult conversations with students. When faced with the unknown
of what students want to discuss, teachers who are confident in their abilities desire to engage students in a dialogue about diversity, race, or other topics related to a multicultural experience (Ashton & Webb, 1986; Pang & Sablan, 1998).

Cultural awareness was also described by the focus group participants who indicated in their discussions that they struggled to understand how to connect with students from diverse backgrounds and that they lacked the knowledge or ability to help students when they became disengaged in learning and struggled academically. Susan recalled this about her conversations:

*We (faculty/staff) are always talking about diversity or culture awareness. For example, students have asked me what does “race” mean, or they will ask me “what race are they?” This came up during my class meeting and I didn’t know how to answer them. I’m ok when I structure the discussions but it’s the unstructured times when it seems more challenging…I don’t think I’m connecting very well to some of my students…*

Teachers found it challenging to talk about race when it arose more spontaneously with students and was not part of their own lesson plan. Susan described that the topic of race came up during her class meetings with her students. She used her class meetings to gather with her students at the end of the day before the weekend. She found that ending the day on a positive, engaging note with the students seemed to help her learn more about her students outside of the classroom. However, Susan was wary about answering students’ questions about race because it dealt with self-identification and the teacher did not feel she could address that type of question. She thought it would be better to redirect
the conversation and have the students focus on answering a prompt to another question that she had already incorporated into her lesson plan.

The teachers’ belief about her lack of cultural awareness and the ability to talk with students is a paradox that the focus group participants wanted to talk more about. The teachers acknowledged that they typically stated they have classroom material “that is reflective of the students in their class,” and they believed in creating an inclusive learning environment for their students, yet there was a dissonance between the teachers’ beliefs about students, especially low SES minority students and their behavior working with students from different socio-economic backgrounds.

**Research Question 2**

*How does a teacher’s sense of personal teaching efficacy change during and following an intervention?*

The data to answer this research question were gathered from the quantitative pre- and post-intervention responses in the Teacher Efficacy Scale (Gibson & Dembo, 1984). Also, qualitative data were gathered during the participants’ group discussions as they developed their lesson plans.

Based on their responses to the personal teacher efficacy items on the Teacher Efficacy Scale (Gibson & Dembo, 1984), participants reported high personal teaching efficacy beliefs before and after the professional development on the Brain-Targeted Teaching framework. One teacher reported slightly lower personal teaching efficacy beliefs following the training. This case will be described in more detail through the qualitative data. These beliefs, however, remained stable within the scores as reported on the Teacher Efficacy Scale.
The high personal teaching efficacy beliefs are represented by participant agreement with the majority of the personal teaching efficacy items, which can be seen in Table 5.1. The personal teaching efficacy sub-scale item responses indicate how teachers’ feel about their own personal skills and competencies regarding teaching content, managing the classroom, and helping students remember learned content.

**Discordance Between Efficacy Beliefs and Behaviors**

The most interesting pattern observed was the discordance between participants’ responses on the TES and their instructional practices. The participants’ PTE scores were generally high, especially regarding items referring to working with difficult students. For example, all five teachers agreed or strongly agreed with these two particular items, “When I really try, I can get through to most difficult students,” and, “If a student in my class becomes disruptive and noisy, I feel assured that I know some techniques to redirect him quickly.” Agreement to these items in particular indicated that they believe they possessed the skills or competencies to work effectively with students who were difficult or disruptive. What was most notable about these responses was that the teachers displayed different behaviors in their classrooms during observations. Teachers reported different instructional practice in the interviews and discussions that contradicted these beliefs about their abilities or cognitive dissonance (Festinger, 1964). According to the qualitative data, the instructional practices and discussions reveal the exact opposite of the teachers’ beliefs in the TES. Their practices revealed low personal teaching efficacy beliefs for redirecting disruptive and difficult students. Moreover, these practices seemed particularly discordant when working with low-SES minority students who were perceived as more difficult or disruptive.
Since the focus group scores were high in personal teacher efficacy and high in general teacher efficacy, it would indicate that teachers believe that teaching can influence student learning no matter who the teacher is. However, they may not have the confidence in their own abilities to teach students in the face of academic hardship.
Table 5.1.

**Personal Teaching Efficacy (Gibson & Dembo, 1984)**

<table>
<thead>
<tr>
<th></th>
<th>Personal Teaching Efficacy</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>When a student does better than usual, many times it is because I exerted a little extra effort.</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>When a student is having difficulty with an assignment, I am usually able to adjust to his/her level.</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>When I really try, I can get through to most difficult students.</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>When the grades of my students improve, it is usually because I found more effective teaching approaches.</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>If a student masters a new concept quickly, this might be because I knew the necessary steps in teaching that concept.</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>If a student did not remember information I gave in a previous lesson, I would know how to increase his/her retention in the next lesson.</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>If a student in my class becomes disruptive and noisy, I feel assured that I know some techniques to redirect him quickly.</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>1</td>
<td></td>
</tr>
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</table>

**Discordance Between Beliefs and Classroom Management Behaviors**

The teachers in this study valued their time with students and understood that a strong and secure relationship with adults in an academic setting stabilizes a child’s behavior and provides lifelong skills that support students throughout their academic and
social career. The challenge was how to develop good relationships with students while also maintaining classroom management so that the learning process was not hindered for all individuals, and that the teachers met their goals for teaching their students. The teachers’ responses to survey item 12 suggests that the teachers believe they have the abilities to manage disruptive students, “If a student in my class becomes disruptive and noisy, I feel assured that I know some techniques to redirect him quickly.” The following account from Mary describes the paradox between reported beliefs and establishing connections with students:

*Having time to get to know my students is a challenge, but it can also be rewarding in creating strong bonds with my students. I have a hard time connecting with some students in my classroom, especially students that have behavioral problems.*

Here, Mary states that the emotional connection to students is important and rewarding, like her understanding of this important strategy from BT1 is affected by her low personal teaching efficacy for working with students with “behavioral problems.” This interaction between teachers’ beliefs and their knowledge of effective practices arose regularly over the course of the professional development.

Additionally, the focus group participants indicated that a student’s negative behavior could be interpreted as a student lacking social skills to navigate the academic setting of a classroom. Often times this behavior got in the way of the learning process for students and it became difficult for teachers to know if the student was struggling emotionally or challenged by the curriculum. During the focus group discussion, I noticed that the participants shared how certain students were being difficult in their classroom and that their behavior, at times, became unmanageable. The following
comments from Mary illustrates a common problem that the participants discussed during their focus group time:

One of my students really struggles to maintain focus in my classroom. He becomes very disruptive and annoys anyone who is seated next to him, or even across the room. I’ve tried different techniques to help him manage his behavior but he continues to be disruptive. I almost think he is doing this to seek attention from me, but it feels like he is disrespecting me and the climate I have created in the classroom. My initial reaction when I’m not able to get the student to change his/her negative behavior is to ask the student to remove themselves from the group or take a break outside of the classroom...after a few minutes I talk with the student and bring them back into the classroom. This is a short temporary fix and I haven’t addressed the problem, really...

The focus group participants recalled how some academically strong students who exhibited the same type of behavior, were allowed to stay in the classroom without redirection from the teacher. However, the students who were disruptive and struggling academically were sent out of the classroom so that the students could regulate their behavior and the teachers could continue with their teaching. It was easier for teachers to send students out of the room in order to continue with the lesson plan for the students who were attentive, focused, and academically stronger rather than stop the instruction and address the other students’ behavior privately. In each of these instances, students who were removed from class were the low-SES minority students. White-American students who were disruptive and academically adequate were not removed from the classroom. This contrast seems to suggest that teachers feel efficacious when working
with disruptive White-American students, but they feel unable to help low-SES minority students.

Removing the students from the class was a short-term fix; teachers did not address the causes of the student’s negative behavior, which was their frustration from not understanding the material. Even though Mary acknowledged that this was not addressing the root of the problem, no interest in understanding the problem better or finding a solution was displayed in the discussions. During the group discussions, rather, the focus group discussed and empathized with one another about the student’s negative behavior. They felt better knowing they were not the only teachers to have problems with the students, but this only escalated the problem because the teachers did not brainstorm ideas about how to help the students. The teachers did not identify themselves as the problem; they believed they had done everything to address the student’s negative behavior and it was the student who was actually the problem. Overall, the participants exhibited signs of low personal teaching efficacy. Through these vicarious experiences shared within the group, their efficacy beliefs were affirmed (Bandura, 1977).

Alignment of Beliefs with Instructional Behaviors During the Professional Development

Following the professional development, one participant, reported a different response to the item that states, “When I really try, I can get through to most difficult students.” Carol agreed with this statement at the beginning of the professional development, but after the professional development, she only slightly agreed with this statement. This can be interpreted as a better alignment and a heightened awareness of her true efficacy beliefs for working with difficult students. Her responses from the focus
group discussions support this interpretation as well. Carol used the strategies from the Brain Target 1, the emotional climate, to notice the changes with students who were displaying negative behaviors and struggling academically. Carol started with small changes: she greeted each student at the door, and she started with her classroom meeting and asked how students were feeling that day. She also asked the students what they were excited about learning in class and she also provided a summary of what they would be learning in class. The meetings ended with each student giving a compliment to the peer next to them; every student received one compliment after each meeting. After the integration of BT1 strategies, Carol noticed changes right away with her students. She described those changes that were gleaned from discussions with their students below:

"One of the changes I began to notice in my students was the increase in attention and motivation in the classroom. I could sense my students becoming more open with me after connecting with them on a regular one-on-one basis to discuss their individual student interests, and feelings about school and home."

By taking the time to get to know her students, Carol built relationships with the students and not only learned more about who the students were, but also learned where the students were having difficulties in the classroom. As a result, the students’ confidence levels increased because they recognized the teacher’s interest in their lives and felt valued by their teacher. Given that Carol used the first Brain Target strategy and felt more efficacious afterwards with her students, she might be expected to continue to use the strategies with all of her students. Incorporating the Brain Target was a more effective solution to dealing with students’ negative behavior and academic struggles than sending the students out of the classroom. In Carol’s case, having these skillsets allowed her to
feel more optimistic in her abilities to change negative behavior. Over a longer duration of time, this would likely result in the increase of personal teaching efficacy.

**Discordance Between Beliefs and Academic Outcomes**

Based on the type of responses generated during the discussion sessions, the focus group participants appeared to lack the confidence in their ability to foster academic growth within students, which indicates feelings of low personal teaching efficacy. When faced with difficult students, a lack of confidence in their ability to foster academic growth also appeared to negatively affect the participants’ confidence in their students’ abilities because teachers held perceptions and certain expectations of students; these low expectations, however, did not match the student’s actual performance. Even when students increased their learning and academic outcomes for example in reading and math assessments, the teachers’ negative perceptions of students did not change. They still held on to the belief that students lack the academic ability to succeed.

The teachers’ expectations of students did not change even in light of the students increase in learning. They still held on to the beliefs that students lacked the academic ability to be successful. The expectation of teachers did not match the student’s level of growth. Students made slow progress but teachers were unable to recognize that even small amounts of growth contributed substantially to the student’s overall achievement. Teachers administered the Primary and Preschool Battery of Phonological Awareness (PIPA) assessment twice during the school year. Teachers kept records on students and assessed their academic levels and compared the gains the students achieved. For many of the low SES students their academic gains were incremental, but continued to make slow progress. These assessments were also compared to the reading and math
assessments given after each chapter lesson. Again, the teachers struggled to acknowledge small gains and progress compared with other students in their classrooms. Thus, teachers’ expectations did not match student growth because teachers were looking for greater gains, and they did not recognize the smaller gains as significant.

Responses to survey question number 6 illustrates the contradictions between these beliefs and discussions: “If I really try hard, I can get through to the most difficult students.” The participants who agreed with this statement indicated they possessed the confidence in their abilities as teachers to overcome factors, such as challenging behavior that makes learning difficult for a student. The participants in the focus group agreed with the statement, however, they lacked adequate experience to develop strategies to support students who faced academic struggles. Further, I observed that they were unable to acknowledge, smaller but significant, academic gains made by the students. The attributes of increased personal teacher efficacy are more explicit in what teachers can accomplish with their students when teachers have a more optimistic view of students’ capabilities. While teachers with higher personal teaching efficacy become resilient in the face of a difficult situation with students, these participant teachers seemed resigned to believe that their most difficult students, who happened to be low-SES minority students, were not capable of progressing. This evidence supports Bandura’s (1977) theory that the beliefs teachers have about their abilities in teaching impact the goals they set, their effort with students, and their persistence in the face of obstacles (Tschannen-Moran & Hoy, 2006).
Changes in Instructional Practices During the Professional Development

The survey results before and after the professional development indicated almost no change in beliefs. The teachers began with relatively high personal teaching efficacy beliefs, and the earlier examples describe the mismatch between beliefs and instructional behaviors. While the survey results did not indicate any significant changes over the course of the professional development, teachers reported changing their classroom practices as they learned more strategies from the Brain-Targeted Teaching framework. These changes in classroom practices fell under the themes of the barriers cited earlier: increasing motivation and engagement in learning, understanding environmental influences, and reinforcing new knowledge.

Increasing Motivation to Learn

When the participants made a conscious effort to motivate their students, the students received affirmation that they were on the right track with the assignments, and this positive feedback seemed to contribute to students’ overall progress. Susan illustrated the extra effort they put in with their students to assess individual academic gains. She was able to have a better gauge on where and when the students’ frustration level occurred with the lessons. Students were then able to do more independent work based on their new knowledge. Susan shared her reflections:

*Changing how I talked with my students helped me to connect with them better. I began to praise them more and find reasons to give them praises. I think I focused on wanting them to internalize their “good deeds” and forgot that I need to give them encouragement as an adult. Just saying to a student they did a good job isn’t*
very clear on what they did. Providing direct feedback and describing what they did well, went a long way to improve their confidence.

Conferencing individually with students demonstrated to the teacher that the student was able to comprehend the assignment, articulate information in their own words, and provide examples of their new knowledge. The students then had the ability to make stronger connections with their learning. The teacher influenced student behavior and supported and celebrated their students’ achievements. Susan noticed the small changes right away in how the students responded to them after the positive feedback teachers gave them. The focus group addressed this [revelation] and described that they wanted praise to be authentic, but also found it difficult to separate it from the internal motivation they believed all of their students should have even before they enter the classroom.

The participants reflected on their responsibilities as teachers to change the course of action for students that seemed less than motivated in their learning. The following is an example of a teacher that highlighted their frustration with seemingly unmotivated students and their admiration for students who exhibited breakthrough moments. Mary stated:

_Some students seem more motivated than others and you know who those students are...they just shine! That’s when I know they are having a “light bulb moment”. Then there are those students who are distracted and disengage. It’s frustrating because they become disruptive._

While the teachers acknowledged that small changes in instructional behaviors, like offering specific praise, could improve student motivation, concern was expressed about this type of practice. From the discussions, teachers expressed conflicting perceptions:
i.e. that they should not have to motivate their students, even though small changes in practices could elicit great improvements in student motivation and engagement. Bandura (1977) implied that when students are motivated, they set individual goals for themselves and regulate their behavior to meet those goals. Motivation helps students begin a task and increases their effort to complete a task (Bandura, 1977). Susan’s students were more motivated because they wanted to do well on assignments so they could take pride in their efforts and accomplishments, and because they wanted to receive that external affirmation. While some changes in practices occurred for some teachers like Susan, a lingering discordance between the practices and efficacy beliefs remained, especially for teachers like Mary who believed that some students were naturally motivated and other students are distracted, disengaged and disruptive.

Motivation is a cyclical and complex process of thoughts stimulating behaviors and behaviors affecting the ability to perform and in turn can affects thought processes. Maslow’s hierarchy of needs is the result of an individual attempting to reach and fulfil their basic needs. (Maslow, 1943). These needs include physiological, safety, love, esteem and self-actualization Dweck (1986) suggests motivation affects how students utilize their currently level of skills and knowledge to acquire new knowledge and transfer their newly acquired knowledge and skills into novel situations.

Understanding Environmental Influences

After the delivery of Brain Target Two, the focus group explored ways to change the physical environment of their classrooms as well as other changes they could do within the classroom in order to increase learning and attention. The layout of each classroom is unique to each individual teacher. They can choose how they want to
arrange the tables, chairs, and visual displays on the walls and boards. They can also choose themes that represent what the students will be learning during the school year. Many of the teachers have white/interactive boards that are mounted on the walls, which at times hindered the configuration of tables and chairs because the students need visual access without obstruction to view the boards from various points in the classrooms when they are seated.

The classrooms have ample windows with exposure to sunlight, and exposure to natural light enhances learning and attention (Hardiman, 2012); unfortunately, many of the teachers pull their shades down because of the reflections on the interactive boards. Hence, the natural light from the windows was not optimized. The use of additional lamps was not an option to change the lighting mood of the room due to the fact that it increases electrical output and energy. Teachers had to find other creative ways to change the atmosphere and be mindful of the students’ attention span and novelty in the learning environment. Jonathon explained that they physically changed the classroom layout to accommodate the multiple groupings of students:

I found the table pods of 4 students too confining and did not allow for a natural flow of students regrouping themselves while they were working on projects. I opted for more casual seating floor arrangements where students were allowed to move the furniture to the sides of the classrooms.

Jonathon also allowed his cooperative groups of students to use different areas in the classroom to work on projects or written assignments. His students used large Post-its to get students out of their desks and move around while they were problem solving or coming up with ideas for a group project. While this type of unstructured freedom in the
classroom could have led to disruption or students not following directions, it created the opposite affect because students were more engaged with their peers. They were not limited to remaining in their seats to sit quietly and create ideas. Jonathon also used this as an opportunity to increase his student’s sense of responsibility in their classroom community with everyone taking responsibility in the classroom appearance and access to classroom materials.

This example illustrates how teachers tried to create a sense of community within the classroom by making it open and inviting. This teacher wanted the students to be responsible for the upkeep of their classroom community and wanted the students to feel like they had a vested interest in the classroom. This teacher helped his students develop shared common goals with their peers as community members, which gave them a sense of ownership and was reflected in their overall happiness about being in school.

Moving the pods around was an effective tool because it created novelty for the students, and the groupings of students provided an opportunity for the students to work with different partners (Hardiman, 2012). Changing the overall layout of the classroom by moving the furniture created novelty and the students were excited about being in the room where they were learning and using the physical materials in the classroom. This is an example of how a teacher took the insights from the BT2, paying close attention to detail in the physical environment of his classroom, to match his instructional practices with his students. After Jonathan changed his behaviors, he also observed improvement in his student’s engagement (Ashton & Webb, 1986).
Reinforcing New Knowledge

Making learning connections for students throughout the delivery of the literacy and science lesson plan was crucial in the learning process; which, therefore reinforced connections for students and aided them in generating new ideas. The participants expressed their own personal view about their strengths and challenges as teachers in modifying their lesson plans. Teachers found it time-consuming to modify their lesson plans when they felt it was just for one or two struggling students even though those adjustments or modifications might benefit other students as well. The perception that teachers had as a result of this line of thinking, caused teachers to feel like they were providing an advantage to struggling students.

In my conversations with teachers there is a pressure from the parents of higher socio-economic status to provide a rigorous curriculum for those students who are gifted. Teachers often felt the need to cater to these families because of their large donations to the school or their ability to fund items directly into their child’s classroom, for example technology software or computers. Parents frowned upon teachers altering the lesson plans to that which appeared to be less challenging for some students. Teachers held mixed feelings at times with differentiating instruction that would lead to augmenting a less challenging curriculum. Teachers thought that if they augmented their lessons to support students who were struggling, they were failing to make the lessons challenging enough. However, if the students continuously struggled with the lessons, it makes it difficult for students to increase their knowledge.

The goal was to find a balance between creating challenging lesson plans and making the right adjustments for students to learn, without creating an unmanageable
level of frustration. This next example demonstrates how Margaret adjusted for the differences of the student’s abilities.

*I used this information to adjust the rate, volume and complexity of this science assignment to meet the needs of individual learners. I began to build the scaffolding to increase basic skills and specifically reinforce the student’s use of effective strategies, as they develop those strategies.*

Margaret built in the necessary adjustments in the science lesson to simultaneously meet the students’ current academic level and to increase the level of difficulty. This required additional prep time but it was noted to be beneficial for sustaining student learning and reducing the frustration level for this student.

**Individual Conferences with Students to Reinforce Learning**

While Margaret found modifying the lesson plan for the student helpful, she had more than one struggling student in her classroom. She decided to conference with her students to accommodate for the other struggling students. However, to conference with individual students about their learning required more than the five minutes Margaret had to devote to them:

*At times, I use differentiation of curriculum instruction through accommodations and modifications. I conference with struggling students and find ways that I can help assists in the learning process. This is not as ideal as I would like for it to be because I have more than one struggling student in my class. It's difficult for me to spend more than 5 minutes conferencing when these students require so much more time.*
Margaret was able to incorporate a modification of the lesson plan into the curriculum but found it difficult to supplement these modifications with spending adequate time conferencing with the students. She shared her frustration with the focus group about her desire to work more with students individually while also utilizing the modification technique.

Additionally, the focus group also shared their common desire to have more individual conferencing time with students and offered ideas of meeting with students before and after school. For some of the participants in the focus group they could not meet with their students before or after school because of other commitments. However, they did agree that during their lunch time or when the students had quiet time, which is called, *DEAR* or drop everything and read, the teachers could meet with individual students.

Similarly, Jonathon scheduled time to meet with students in the morning before class began. This gave him an opportunity to work individually with the students’ who struggled on science and literacy concepts. The one-on-one time provided the students encouragement and guidance from the teacher and it allowed the teacher to help reinforce the students’ learning concepts as he worked on the literacy with the students. This example provided the participants in the focus group, through modeling another teacher’s example, strategies that were proven to be productive experiences for Jonathan’s students. Teachers that exhibit higher PTE are more likely to continue to work with challenging students who are struggling to learn concepts and try to break those challenges down into manageable tasks in order for students to achieve success. This outcome benefits the teacher who then feels competent in their skills and abilities as a
teacher; in addition, it benefits the students who feel success in their academic achievement (Bruce, Esmonde, Ross, Dookie, & Beatty, 2010; Epstein & Willhite, 2015).

**Integrating Art, Reflection, and Writing to Reinforce Learning**

Additionally, some participants offered examples of finding different means of allowing students to express themselves in the classroom. The participants discussed the literacy lesson that they introduced to the students along with the reading and writing assignments. Some found that providing moments of reflection and writing helped students organize their thoughts; while others used art as a medium for students to create excitement. Primary students had the option in the classroom to use work stations to reinforce their learning. The teacher provided each station with materials and instructions for students. For example, during the literacy lesson plan, the writing station was supplied with paper, pens, crayons, and paint for the students to use on their assignments. Another station was supplied with play dough and cut outs.

In addition, there was also a library and book station for students to read and recall their learning and to sort through their “just right” books that the teacher had chosen for each student at their appropriate reading level. The journal reflection entry from Carol provides an example of how she chose books that were at the appropriate reading level for one student. Carol also knew what type of characters the student enjoyed reading about.

*I began to choose a diverse assortment of literature for my struggling student to read based upon their interests and where their strengths were. For this particular assignment for my kindergarten students I chose books that they could identify with characters in the literature. I used the “workshop” model, which*
involves flexible, cooperative learning groups, to support their understanding and sharing of their knowledge with peers. I began to see and reinforce verbally those moments when students were demonstrating grit and determination.

This example shows that making adjustments in the activities for different learners improved teachers’ confidence in their abilities to teach. Teachers changed their practices to assist students in their learning, and they simultaneously built confidence in their abilities to facilitate student learning. Through the use of the different multisensory activities and students cooperative learning groups, the teachers observed an increase in student learning by the students’ positive responses in their groups. This teacher also used Running Records which is a formative assessment to record the number of words a student read out loud correctly in their just right book selection. This type of assessment allows the teacher to monitor effective and ineffective reading patterns and reading accuracy (Shanahan & Barr, 1995; Clay & Cazden, 1999). The use of Running Records while recording the student’s responses provides one way for teachers to measure growth and reading level for individual students. Especially, students who are struggling readers and require more individual assistance. The teacher can monitor reading and provide individual feedback and praise for the student. This would likely improve teachers’ sense of personal teaching efficacy with continued monitoring of students and continued use of these strategies by the teacher for a longer duration of time (Ashton & Webb, 1986; Bandura, 1977).

Using Graphic Organizers to Reinforce Learning

The participants utilized the strategies from the BT 3 which included ways for students to extend their knowledge through graphic organizers, road maps and visual
representations. This allowed for students to connect their learning by other means and to retain more information. Students were able to capitalize on their knowledge by making connections to the material and visually show what they had learned. Using visuals organizers aided students who had difficulty getting their thoughts on paper or students who would get lost during the instructions. This type of aid provided students with an anchor to begin their work independently and work generate problem solving skills.

Teaching creative activities such as conducting investigations and surveys, reflecting on learning, problem-based learning, generating multiple solutions, and create analogies can change cognitive functions and brain structures. One of the educational foundations of Smith Academy is creating learning activities for students to apply their knowledge when they are out in the community doing service-learning. This also applies to teachers opening their classroom doors to adult volunteers from a variety of communities, businesses and levels of work expertise to share their knowledge with students. Jonathon describes the strategies he utilized with his students in preparation for adult volunteers presenting in the classroom or when the students participate in service learning activities:

*Creating a study guide, global planning (cross-curricular connections) help students become divergent thinkers, and how they can come up with new questions and ideas. Using open-ended questions and incorporating more experiential learning assignments across the grades brings together exploration and students’ talents and interests in their learning.*

Strategies from BT3 provides ways for students to extend their knowledge through the use of graphic organizers as an approach of connecting the students’ prior knowledge.
with new knowledge. Jonathon chose to think about his students and what they needed to extend their knowledge. Visual organizers worked well for some of his students’ learners because they acted as visual representations for students having difficulty seeing the over-all ideas or concepts in learning. Creating visuals for students when introduced with new topics or new lessons allowed students to see the flow of learning and how they can organize their thoughts. Other ideas such as concept mapping, rubrics and creating mind maps can stimulate a student’s ideas (Boon, Burke, Fore & Spender, 2006; Choiu, 2008; Hardiman, 2012; Osmundson, Chung, Herl, & Klein, 199; McAleese, Gabinger, & Fischer, 1999). Jonathon used his students’ end of the year portfolios and journals as tools for students to use that widen their knowledge so they could visualize their academic growth. While the typical assessments at the end of textbook chapters or review handouts are the conventional methods to assess learning, the portfolios and journals were another way for his students to reveal what they had learned in their own words. In addition, Jonathon always gave compliments in his student’s journals at the end of each week.

In summary, these teachers came to rely on Brain-Targeted strategies in their teaching practices and were more open to integrate novel strategies in their teaching preparations. One of the ways the high personal teaching efficacy may have been affirmed was when teachers received encouragement from other teachers. It may have been through this verbal persuasion that teachers found encouragement from one another who experienced the same struggles as they did. As a result, they shared different techniques and ideas to persevere and to keep working with difficult students. Over time, should these teachers continue encouraging one another this way, it is likely that they will
experience increased general and personal efficacy. While they reported changes in instructional practices in the discussions, only one teacher indicated a change in personal teaching efficacy beliefs. What seems to have occurred is that teachers’ practices began to come into better alignment with the high personal teaching efficacy beliefs that the teachers reported in the beginning and end of the professional development.

**Research Question 3**

*How does a teachers’ sense of general teacher efficacy (GTE) change during and following an intervention?*

The data for this research question were collected from the quantitative responses from the participants before and after the intervention. These responses provided additional information and were triangulated with the qualitative data obtained from the participants during the collaborative discussions, classroom observations, and post-interviews with the focus group participants. Research Question 3 and Research Question 4 are reported together and discussed in the participants’ vignettes to better describe the relationship between efficacy beliefs and beliefs associated with teaching practices.

**Inconsistent and Mixed General Teacher Efficacy Beliefs**

At the beginning and at the end of the professional development, the participants’ responses to the Teacher Efficacy Scale (Gibson & Dembo, 1984) indicated mixed beliefs in general teaching efficacy. The general teacher efficacy beliefs are represented by the participants’ mixed agreement with the majority of the general teaching efficacy items, which can be seen in Table (10). For example, the focus group participants indicated that a student’s environment is a primary factor in their learning. This was confirmed in their survey responses by agreeing with statements like, “If parents would
do more with their children, I could do more,” or “The amount that a student can learn is primarily related to family background.” Another statement from the survey states “A teacher is very limited in what he/she can achieve because a student’s home environment is a large influence on their achievement.” The participants disagreed with, this statement, which indicated that the teacher does not feel limited in what they can do with a student in their classroom.

Table 5.2.

*General Teaching Efficacy (Gibson & Dembo, 1984)*

<table>
<thead>
<tr>
<th>General Teaching Efficacy</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. The hours in my class have little influence on students compared to the influence of their home environment.</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. The amount that a student can learn is primarily related to family background.</td>
<td></td>
<td></td>
<td>3</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5. If students aren’t disciplined at home, they aren’t likely to accept any discipline.</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. A teacher is very limited in what he/she can achieve because a student’s home environment is a large influence on her/his achievement.</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. If parents would do more with their children, I could do more.</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. The influences of a student’s home experiences can be overcome by good teaching.</td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>14. Even a teacher with good teaching abilities may not reach many students.</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
While there was no change in the participants’ survey responses before or after the intervention, the participants discussed in their focus groups how they spent more individual time with students on learning concepts and reflected more on the learning needs of students, especially when students did poorly on an assignment, quiz, or group project. Their discussions demonstrated beliefs and practices of higher personal and general teacher efficacy, including their ability to make adjustments to lessons, manage classroom behavior, and use effective teaching approaches in order to increase student attention. However, the participants’ discussion regarding academic struggles and how to support them indicated that teachers still struggled to manage students’ behaviors with more effective strategies. This might have led to the inconsistent results of students because they struggled to find solutions and strategies for managing student behavior.

The discrepancy between the survey responses and the group discussions suggested that teachers can make adjustments and work individually with students to accommodate those who are struggling. Their reported instructional practices changed throughout the professional development in order to assist the students. However, because the teachers may lack the right tools or believe they lack the tools, the students may still struggle because the teachers may not be able to effectively help the students. This challenge leads into the question of how to engage students in their learning.

Understanding Environmental Influences that Affect Learning in the Classroom

There are a number of influences that affect the learning environment for students. These include stress and emotions. The connection between emotions and learning is often the missing or overlooked piece that is connected to specific skills for students to succeed in school, and teachers making connections with families, and their
environment impacts a student’s emotional wellbeing in the classroom (Davis, 2003; Elias, 2006; Hamre, Pianta, Downer, & Mashburn 2008). Two of the major influences identified throughout the intervention were stress and emotions and the effect they have on the learning environment. When stress and emotions are taken into consideration along with student demographics and teachers’ personal biases, the classroom environment can fluctuate with experiences that are positive learning events, or can result in ineffectual experiences for students resulting in lack of student achievement. Research conducted by Goodman, Miller, and West-Olatunji, (2012), examined a Early Childhood Longitudinal Study, Kindergarten Class of 1998–99 database, that was designed to measure children’s cognitive development and factors associated with learning. For example, school environment and home environment, qualifications of teachers, curriculum and parent interviews were evaluated. The result from this study indicated traumatic stress can be substantial indicator in student achievement which can be overlooked by teachers and administrators and/or often misinterpreted as academic problems attributed to behavior problems or low competence.

**Student Demographics**

The majority of the students at Smith Academy are from the higher socio-economic status and predominately White American. A smaller number of low SES students are spread among grades kindergarten through 5th grade. There several African-American boys and girls in 3-4 of the grades and one or two Hispanic, Pacific Islander and African students. The students from the participants’ classes that were highlighted as struggling academically and having behavior issues were identified as low SES minority students. They are on financial scholarship and receive more than 75% aid. Some of these
students live in environments where families are concerned about their safety and within communities that are not typical of the majority of the peers in the classroom. The majority of the students in these classes are affluent and come from two-parent households. The parents of the low-SES minority students have the same dreams and values as other parents do: they want their children to succeed academically, to be in a rich, stimulating learning environment, and they want them to be happy and make friends.

As the school counselor, I met weekly with teachers about the students in their classrooms. I worked one-on-one with students that were referred to me by the teachers who had academic or behavioral issues in their classrooms. I also met with parents regarding student behavior and worked with the teachers on supporting students in my role as the counselor. In addition, teachers who indicated they struggled with some of their students who were from diverse backgrounds needed additional advice. I spent time with teachers as the counselor discussing the student’s home environment and the adversities that some of these students experienced as part of their everyday life. For most of the teachers, they had very limited background in cultural awareness other than once a year mandatory professional development at Smith Academy. All of the desires and concerns brought up by parents and teachers were shared with the intervention participants and incorporated into the training. This information was gathered by me in my role as the school counselor. My conversations with parents regarding their desires for their children happened throughout the school year as I meet with them before and after parent conferences or when they needed to schedule an appointment with me as
needed. I met with teachers on a regular basis about students in their classrooms when parents shared personal information about their children.

**Acknowledging Personal Biases**

The participants discussed at times they felt a lack of respect and lack of academic motivation from some of their students. The participants concluded that because they lacked experience working with students from diverse cultures or socio-economic backgrounds, their own personal biases prevented them from exhibiting cultural awareness of their students so they could have the knowledge to create authentic inclusive environments for the students. Thus, their biases affected their perceptions about their students’ academic abilities, especially low-SES minority students. Teachers’ also indicated they had difficulty making personal connections with students from different socio-economic backgrounds. Susan explained:

*It is easier to talk about differences in a global sense than it is to discuss the personal differences in the makeup of my students.*

In my conversations with teachers, they shared that it was easier to talk with students about diversity in other countries because teachers could easily relate it to the school’s mission statement or the school’s philosophy. The mission of the school began with experiential learning and progressed to include *global citizenship.* When teachers have discussions in their classrooms in regard to poverty, social class, and race it is in the context of other countries and not related to poverty and social class in the community in which students live. The classroom discussion with students typically pivots around global awareness and little about the disparity within communities in the United States. While this discussion represents an anecdotal conversation with the focus group
participants, it reflects their sentiments and struggle with recognizing or not wanting to call attention to students who may live in communities where poverty and social class are very real distinctions that students’ experience on a daily basis. Often teachers do not want to draw more attention to the low-SES minority students by talking about their communities and elevating discussion that would put students in an uncomfortable position of having to respond to questions from peers about the kind of homes they live in or how much money their families make. Another question that caused teachers concern related to why teachers only talked and emphasized the history of African-Americans during Black History month. Infusing multicultural education into the curricula had been left up to the faculty. However, there has not been a systematic path in achieving a complete integration of multicultural education or prerequisite from teachers to have a culturally diverse knowledge base from continued professional development as affirmed in the research of Banks (2015) and Gay (2002), which states that teachers need to be culturally responsive educators.

**Stress and Emotions in the Learning Environment**

The participants considered the ways in which stress affected some of their students, specifically students from low socio-economic families. The participants felt that they tried to make social connections for those students especially when they were new to the school. Many held activities with their students to increase teamwork capabilities and promote inclusivity and positive friendships. However, when it came down to the stress that some of these students endured during the school year, teachers felt they lacked the resources to aid students, especially when a student’s negative behavior became the concern. As a result, teachers would remove the disruptive student
from the classroom and even send the student to the counseling office. Teachers with low self-efficacy focus on what went wrong, or what will go wrong, especially in stressful moments with students (Ashton & Webb, 1986). Even though teachers reported high personal and general teaching efficacy, their practices and beliefs regarding low-SES minority students indicated low self-efficacy beliefs.

When teachers were faced with the everyday realities of teaching and students not meeting the demands of the curriculum, teachers felt less confident in their teaching abilities. Low self-efficacy is associated with teachers feeling disconnected from struggling students and a failure in recognizing their abilities to help them overcome their behavior or their academic challenges (Ashton & Webb, 1986; Gibson & Dembo, 1984).

Teachers were aware of the stress that students carry into the classroom from their home environment or their environment outside of school. In my conversations with teachers as the school counselor, I have shared information regarding the types of stress or anxiety students are exposed too. Much of this stress is from the student’s home environment and their daily living experiences. Parents shared with me, in my role as a counselor, that they wanted their child’s educational experience to be positive and they wanted them to be academically successful. They also knew that having a private education comes with a price and they shared that that price was sometimes having to accept the disparities in social class in this type of environment. They trusted that the teachers had experience and educational backgrounds to navigate conversations with students that are reflected in the school’s mission of inclusivity and educating diverse students.
Margaret’s Story:

Part 1: Emotional Connections

Teachers helped implement actions to create emotional connections within their classroom, therefore it is important to understand that the emotional climate in the classroom environment is vital in student learning. The following statement of Margaret indicated how they looked for ways to connect with their students on a more personal level.

*It is important to wade in so to speak, to get to know students, to share space and find ways to bring out and celebrate the important pieces of one's life...rituals like food, celebrations, music, story-telling, games and art are easy, non-threatening connectors for cultural bridges. It really depends on the class of students, the kinds of cultural differences, and the culture of the school. It takes time to build trust.*

Margaret attempted to find points of access in getting to know their students and wanted to understand her students better in order to create a friendly, inclusive environment. By connecting with students in various ways, teachers can model and explicitly teach openness, kindness, acceptance, tolerance, compassion, and guide students towards building relationships and embracing differences with one another. Margaret used The Brain Targeted Teaching strategy of establishing the emotional learning environment for students. This participant found ways to connect with her students through using a student’s culture to highlight their differences as a way to promote inclusivity and acceptance from other students. Margaret was an example of a teacher building trust with their students because it made the students feel valued by the teacher and by their peers.
Finding ways to celebrate differences in students, builds trust between students and teachers (Hardiman, 2012).

Establishing relationships with students began when teachers took the opportunity to carve out time with each student in the classroom. When teachers talked with their students and took an active role in understanding what the challenges were for students, students began to feel more secure in their abilities. When students struggled either with learning or their behavior, the teacher had already laid the foundation for talking with the students because the students believe that the teacher cared about them, even though the teacher needed to redirect the students’ behavior. This increase in trust and the emotional connection to the teacher resulted in higher levels of motivation and engagement from Margaret’s students. Increased motivation from the students seemed to improve teacher efficacy beliefs and confidence.

**Part 2: Margaret’s Struggle with Her Student’s Emotions**

In my role as the school counselor and during our regular faculty meetings that occurred before this intervention, I discussed various topics of concern with teachers on a regular basis. These conversations continued through the school year and included my conversations with parents and individual conversations with students as well. When teachers were faced with the everyday realities of teaching and students not meeting the demands of the curriculum, teachers felt less confident in their teaching abilities. Low self-efficacy is associated with teachers feeling disconnected from struggling students and a failure in recognizing their abilities to help them overcome their behavior or their academic challenges (Ashton & Webb, 1986; Gibson & Dembo, 1984). Margaret describes these feelings when one of her students had a panic attack in her classroom:
I didn’t know what to do in that moment, he walked in my classroom every morning crying to the point which I couldn’t control him. I called the counselor to meet with him. I needed to start class and the other students were looking at him…I need to get the kids started with their day.

Margaret described to me how Ben started his day entering the classroom each morning crying. It was difficult for Mary to spend time with Ben trying to understand why he continued to cry. I shared with Margaret that Ben had developed panic attacks and became fearful being in the classroom. Margaret had seen Ben in her classroom many times and he seemed fine most days, however there were times when something in the classroom would trigger his fear and he could not focus and would begin to cry. Margaret talked with Ben and suggested he leave the classroom and go to the office to sit for a few minutes and then come back. I suggested to Margaret that he meet with me in my office and I would return him to his classroom after I talked with him. In my conversations with Ben he shared that learning is hard for him and he gets frustrated when he does not know the answers. I told Ben we need to retrain his brain so that he would not feel anxious and begin to cry when entering the classroom. Then, I told Ben he could meet with me before class started and we would walk together to his classroom. We stopped at the door every morning and reassured him that he was going to feel ok and have a good day with Margaret and that Margaret was looking forward to seeing him in her class. I also told him I would check in with him at the end of the day for a few minutes.

In my conversation with Margaret, I could sense she was uneasy with me meeting with him on a regular basis for a few minutes and checking in with him at the end of the day. Margaret stated that she thought Ben was just being immature and seeking attention.
I suggested to Margaret that she talk with Ben and encourage him that his classmates were looking forward to seeing him each day and that she valued his input and ideas.

Learning is connected to emotions and shaped by thoughts and feelings. Sometimes, teachers recognize when students are stressed and resolve the issues immediately. However, with some students it takes time to develop the emotional connection that is needed to encourage emotional growth, so that higher-level learning will occur. When students are faced with problems they worry about during the school day, they can become distracted and even become fearful and insecure. Margaret’s student was an example of how stress becomes overwhelming for a student and they are not able to concentrate in the classroom. Stress affects students’ learning, and for students from lower socio-economic backgrounds it can be even more challenging if teachers lack awareness of the emotional needs of their students. Emotions are also connected to behavior when students develop fears or express fear, which impact a student’s learning. Positive and negative experiences stimulate neural activity in the brain, which activates learning. This is evident in the classroom when children are learning. However, stress can impede learning resulting in students becoming distracted, showing emotional signals that often times teachers are not aware of which impacts learning (Immordino-Yang & Damasio, 2007; Kotulak, 1996). Margaret attributed Ben’s crying to his immaturity and did not recognize that he needed encouragement and acknowledgement from his teacher. Although Margaret participated in the discussion with the focus group and used some of the strategies offered during the BTT sessions, she could not connect in the moment when this student was struggling and believed his emotional upset stemmed from craving attention. Margaret did not recognize that below the surface was a student who felt
insecure about his abilities and it affected his performance in class. Margaret relied on removing him from the classroom until he was able to get control over his emotions. Incorporating BT1, emotional connections, into Margaret’s teaching practices would give her the tools to recognize Ben’s insecurities about his learning and encourage her to continue working with Ben in the classroom.

Although Margaret incorporated modifications in her lesson to accommodate her struggling students, it was difficult for her to develop the connection emotionally with Ben. While she was able to utilize strategies from the BTT, she was unable to change the emotional climate for this student. Margaret struggled to make a connection with this student. She could not alter her own beliefs that Ben’s emotional unrest in the classroom was connected to her own lack of empathy. Margaret also could not change her perception of Ben to make an effort to connect with him so that he could gain confidence and feel secure in his learning abilities. Margaret did not see how her negative perception of this student affected Ben’s confidence level and his sense of belonging in the classroom.

Mary’s Story

**Part 1: Acknowledging Student’s Emotions**

As the school counselor, I talked with teachers about stress and the impact it has on some students. Teachers often make assumptions that students should know how to regulate their emotions once they enter the classroom; or that students should have the ability to disengage from whatever is causing the stress and focus on being in the classroom. In my conversations with teachers I reminded them that their students are still learning to navigate their emotions. Requiring the students to disengage abruptly from
their emotions or stress as soon as they enter the classroom negates their feelings and leaves their feelings unresolved. It is not easy for students to turn off their emotions instantaneously.

When students transition back into the classroom from recess they often have been exercising and playing physically with each other. There were times when students had disagreements with each other that lead to tears and hurt feelings. If students were not allowed to process those feelings and then were directed to come inside and begin working, they were often left with unresolved feelings, which could spill over into the classroom. This quote offers a typical comment from the focus group participants when students were called inside after their recess was:

Class please enter the building with respect and keep your voices down. Your recess is over and you need to get back to work. Please line up quietly... I’m sorry that Johnny hurt your feelings but we don’t have time to resolve the issue now. We need to begin class...

On occasions, I observed the students during their recess and their transitions back into the classrooms. This example illustrates that teachers are focused on getting the class back to order after recess and not paying too much attention to the students’ emotional needs. In this example teachers are directing students to resolve their own feelings, quickly and then switch to sitting quietly and begin work. For some students, this is difficult and can lead to students’ inability to focus. I described this to the focus group participants that additional time spent with the students transitioning back into class could avoid disruptive behavior that escalated from the student’s recess.
In addition to what students were experiencing outside of the classroom, some students experience stress even before they enter the classroom because of their perceptions of their teachers. Mary recounts how surprised she felt to hear her students’ perceptions of her:

_I overheard two students say, they didn’t think “I liked them” because they always get in trouble and I would get “annoyed” with their behavior. It shocked me because I like all of my students…_

**Part 2: Mary Considers How Her Actions Affect Her Students**

Whether this is an accurate perception or not, this particular student felt the teacher did not like them, which indicated that students felt stressed every time they were in the classroom. This quote also suggested that this teacher unknowingly projected her own perceptions back on to the students, and that this perception affected students’ self-esteem and their academic output. It is difficult to change a person’s view or to get them to be reflective on matters that are difficult to talk about, but having discussions on negative perceptions and stereotypes offers a chance to hold important conversations that impact a student’s well-being, both academically and emotionally. Banks (2015) makes the argument that some math and science teachers are very knowledgeable in their content areas but lack understanding of how multicultural education affects all aspects of learning. This conversation with Mary indicates that she was considering how her actions might be affecting her students’ behavior and their outcomes in her class. Moreover, it seemed like Mary was beginning to acknowledge how her classroom behaviors were perceived by some students to be in opposition to her beliefs about how she “liked all” her students. This type of reflection indicated that Mary was grappling with this
disconnect, which is a precursor to belief change, not just an efficacy belief change, but potentially a cultural competence belief change. After discussion with the focus group participants Mary reflected more on how she could change her demeanor to reflect how she truly cared about her students. Mary viewed herself as a strict teacher but may not have always seem approachable. Overhearing these comments from her students made her more reflective on changing her student’s perception.

Carol’s Story

Changing Practices After Observing Colleagues

After the presentation of the introductory session on the Brain Targets, Carol and I had an individual conversation about the students in her classroom and her previous students. She stated she would like to observe other teachers in the classrooms working with her current class and her past students. I suggested she use her planning time to schedule classroom visits. Carol indicated her focus was on the emotional climate of her classroom because she had a number of students who were challenging to manage and support their academic needs. Carol used her prep time to observe the students in other classes. The following is an account of Carol’s reflections:

I like to observe students in the classroom and outside the classroom to better understand his/her personality, to learn what motivates him/her, to see what troubles s/he carry, and to see what self-confidence is intact or what repair needs to be done to get it back inline. I sometimes take the opportunity to see my students in other classes such as art, music, PE, and technology. I can see how they are learning in a different environment and also how they are managing or not managing their behavior very well.
Carol was receptive in using other teachers’ techniques to connect with her students, and open to the idea of looking at how other teachers work with students, especially around behavior, and how to implement those techniques into her classroom. She tried to increase her efficacy through observing other teachers working with her students. Her direct experience of observing another teacher in action, either in a positive or negative interaction, increased her desire to recapture this experience. She also realized that the negative response she observed would not be a useful technique because it resulted in a less than positive outcome with the students. Vicarious experiences, which is one of the four sources that leads to increased teaching efficacy (Bandura, 1977; Tschanennen-Moran & Hoy, 2001), helped Carol increase her own efficacy beliefs.

By observing another colleague and the positive results she gained with students, the participant used those techniques to work with her own students. Carol was able to implement one of the techniques that resulted in a positive outcome with her students. Carol typically raised her voice and asked for the students’ eyes and bodies to face her direction. Although some students responded immediately, other students continued to talk and engaged in what they were doing at the time. Carol repeatedly asked for the student’s attention more than twice on any given occasion. When Carol observed the teacher in another class she noticed that the teacher quietly recited the verse “one, two, three, eyes on me.” The students responded quietly and clapped the verse back to the teacher. Carol noticed right away how her students responded to this redirection and without a repeat of the verse. This example illustrates the benefit of observing students in another teacher’s classroom because students may respond differently in other classroom environments with other teachers. Carol began using this technique with her students on a
daily basis. She noticed that she became less frustrated with her students because she did not have to continue redirecting them to get their attention. She realized that her students responded to her and completed the tasks but, also noticed the students offering assistance to other students that needed it, especially after an activity that required clean up. Teacher observation and personal reflection for Carol provided her with new insights on managing her students and connecting with them. This new insight gave her a positive experience with her students and a new outlook on her students performing and having success outside of her own classroom.

Research Question 5:

*What support (or professional development needs) do teachers perceive as important for maximizing student success in the classroom during and following an intervention?*

**Professional Development**

The data collected from the qualitative responses from the focus group participants indicated they would like to have more time for meaningful professional development. The participants acknowledged conferences they attended in the past were good however, most of them were one-day workshop models without an opportunity of on-going support and continuing education. The participants also added that their professional development were specific workshops related to their content area. While this was fine, they also wanted professional development that focused on the social emotional component of learning and classroom management. Even though they enjoyed the professional development workshops in the moment, their enthusiasm seemed to wane when they returned back into their classrooms. The focus group participants felt the piece that was missing was either continued follow-up with other participants or
support from professionals delivering the workshops and allowing the faculty time to share their experiences, and their newly acquired skills with their other colleagues, increased the opportunity for application directly into their classrooms with their students. It is recognized in the research on teacher efficacy that sustained belief change comes from mastery experiences and vicarious experiences, and it seems that the teachers were acknowledging that without these experiences, their interest in integrating their new knowledge declined over time for other professional developments.

**Embedding Professional Development Programs into the Classrooms**

The criticism of professional development and the lack of ongoing support is a sentiment reflected in the research for professional development. Darling-Hammond (1999), suggests professional development for many teachers may seem detached from the context, activities or challenges of teachers who need professional development to address their student’s needs. The majority of participants had some experience with professional development online, and attended national associations with their teaching partners.

Jonathon explained how the BTT Model enabled him to gain specific skills that worked well with the school’s philosophy.

*I think The Brain Targeted Teaching Model works well with the school’s educational philosophy because it utilizes what comes so natural to many of our students. We can expose students to activities that are “outside the box” because as an independent school we have more flexibility in our teaching program.*

He also stated that he felt positive about undertaking action research because:
It provided me an opportunity to work in a small group with my colleagues. I usually work with my teaching partner but this was different. We actually collaborated about strategies to use in our classrooms. We had the time to discuss them...without feeling pressured in that moment to solve a problem and then move on.

The collaboration with teachers as they weaved in and out of the action research method blended well with the focus group participants. By including teachers in the research process, teachers found support with each other and shared their teaching perspectives.

**Expanding Neuroscience with Teachers and Direct Application to Students**

 Teachers stated their need for professional development that is applicable to their instruction in the classroom, and relevant to the learning experiences of children by helping students make real world connections to their learning. The research from Dubinsky et al. (2013) suggests, teachers’ knowledge in neuroscience has direct application to expand their knowledge in understanding brain development and learning. Teachers with this knowledge can apply it directly into their classroom practices and feel confident that their students will also benefit from it. Carol shared her final reflection on understanding how the brain learns with one word: *Plasticity...which I will continue to share and emphasize this with my younger students.* Carol indicated that a simple word such as plasticity turned a lesson plan into a wealth of discovery projects with her students that made them aware of their own capabilities. She further added, that the progress she saw in her students, while they did not make large academic gains, she saw more developmental gains within the classroom that affected more of their temperament or general eagerness to learn more. The BTT model for Carol helped her make strong
connections with her students and a deeper emotional connection with her students. She began to understand that for many of her students the emotional component in learning encouraged her to understand her learners in different contexts and to view them in her classroom with a wider appreciation of their cultural differences, and learning styles, and behaviors. Carol’s experience of infusing neuroscience into her classroom practices, resulted in her understanding of neuroscience and her students increasing their own understanding of learning. Over time, if Carol continues to utilize the concepts of neuroscience, such as “brain plasticity,” she can improve student learning by strengthening and increasing neural connections during learning (Dubinsky, 2013; Hardiman, 2012).

There were moments of breakthrough with the focus group participants. They saw their efforts with their students were positive especially with low-SES minority students and they were optimistic in continuing their new strategies. This sentiment shared by the participants is encouraging because it demonstrates their participation in the BTT model served to fill a need the focus group had been looking for in professional development. The model of action research offered teachers positive learning experiences in an environment that supported them emotionally as well as intellectually.

**Professional Development and Increasing Teacher Efficacy**

Ross and Bruce’s, research (2007) asserts that professional development supports student achievement if the professional development acts as a stimulus for increasing teacher beliefs and teachers can develop strategies that help students achieve greater academic success. In their study noted that professional development focused on the four sources of efficacy, most notably increasing the opportunity to reinforce mastery for
experiences. In addition, vicarious experiences for teachers that strengthen self-efficacy, such as their experiences gained throughout this intervention, gave teachers the opportunity to develop the strategies from The Brain Targeted Teaching Model and applying them directly into their instruction with students in their classrooms.

Although the Ross and Bruce (2007) study is a randomized field test with an emphasis on mathematics content, the researchers suggested that a clear focus on teacher cognition, especially the beliefs teachers have about their ability to bring about change in student learning, is an effective means of professional development. When professional development is focused on addressing the sources of efficacy in teacher beliefs, teachers feel more successful with their students. Utilizing The Brain Targeted Teaching Model, (Hardiman, 2012) within a professional development community and employing action research methods encouraged teachers to introduce neurocognitive research into their teaching practices. The focus group participants felt more efficacious during the intervention and increased their cognitive knowledge by introducing learning strategies to their students and developing specific strategies to their struggling students. The research from Chong and Kong (2012), supports this notion of collaboration in professional development that promotes teacher efficacy to strengthen student achievement by encouraging positive behavior responses from teachers.

**Participants’ Engagement in Action Research and Self Efficacy**

Action research is a strong tool when teachers work alongside researchers to change and improve an educational setting. In this intervention, teachers felt that working cooperatively with their colleagues was an effective method of support for teachers with shared professional goals. Teachers readily relied on their colleagues, for support in
lesson plans and teaching practices or methodologies from their peers. Sharing strategies creates bonds with colleagues and increases a community atmosphere. The participants expressed during the intervention that having a scheduled time to meet during the day, specifically for meeting as a focus group kept the momentum of the intervention progress going. The participants looked forward to meeting as a group and discussing their progress with students using the lesson plans they worked on together. Jonathon shared:

*The input from my colleagues is invaluable. This process works well with our collaborative staff meetings that are already in place. The smaller group interaction is great for problem-solving and getting immediate feedback.*

However, teachers also need professional development that is related to supporting all students, especially students from low-SES backgrounds.

Teachers could not rely on their colleagues only for their knowledge in content area. The focus group participants indicated that participating in this intervention as part of the research was an experience that was new to them at Smith Academy. The structure of the Professional Development Learning Community enriched the teachers’ ability to talk through their issues with students in their classrooms. One of my roles as a school administrator and school counselor has been to share confidential information from parents regarding their children’s social/emotional needs as well as their academic needs with the teachers. This is a partnership with faculty that provides teachers with information such as divorce, death of a family member, changes at home, and changes that affect parents and their children that could impact their everyday life. My role as an advocate for children at Smith Academy was to make sure teachers provided the best learning environment to support students, especially low-SES minority students in the
classrooms. While those issues were student-related, they were also related to the actual classroom itself as described previously with the participants during the BT1 and establishing the emotional climate. The focus group participants also discussed that having the ability to talk across the grades and hear what other teachers were doing in their classrooms gave them a different perspective on classroom management, and a different perspective on implementing the science and literacy lesson plans.

While it is important for teachers to feel supported by their colleagues, it is also necessary for teachers to continue to increase their own knowledge of teaching practices through professional development. This professional development helped teachers recognize self-efficacy and how their perceptions and beliefs influenced students’ academic success.

Providing the faculty with professional development helped teachers to recognize self-efficacy and how their perceptions and beliefs can influence students’ academic success. Additionally, work in this area has the potential to address teacher’s belief about cultural barriers that affect the academic success of students.

**Cultural Awareness and Multicultural Education**

For the majority of the participants in this study their professional development in multicultural education was provided by the school once a year. This professional development was a mandatory requirement for faculty and staff to attend and participant. Each workshop was different and included many topics of discussion with time at the end of the day for small group interaction. There was been no direct follow up after the professional development workshops, other than the *Diversity Talks* in which the faculty participated on a voluntary basis to discuss these issues with me as the facilitator.
The focus group participants indicated that the *Diversity Talks* were an opportunity for faculty to discuss curriculum on multicultural education, however there seemed to be a lack of support from the administration and a requirement for all faculty. As an administrator at Smith Academy, the lack of follow-through with the faculty in providing ongoing professional development connected to multicultural education lacks consistency that does not follow the school’s philosophy. Smith Academy speaks well to what they believe is multicultural education that includes a diverse student body inclusive of various socio-economic levels, with cultural and religious backgrounds of students from varied communities. That looks great to the public, but it does not mean that teachers possessed the multicultural foundation that leads teachers in altering their own biases and developing culturally responsive teaching in order for students to achieve optimal success, especially low-SES minority students.
Summary

The first research questioned focused on the teachers’ perception of the barriers that impacted student learning. Through their interactions during and after the intervention teachers were able to discuss ways to motivate and engage students in their learning by utilizing brain based research that supported instructional learning for students, especially low SES minority students. Teachers recognized during this intervention the environmental influences that could be enhanced to increase student knowledge by providing novelty in the classroom environment and designing the classroom to create more engagement when students are working in small groups or individual work.

This study also reflected on individual experiences from the teachers during their instructional time with students. Many of the participants were aware of the influence the environmental factors had on learning, such as stress and teacher perceptions, however with this study, teachers recognized their own biases that prevented or stalled learning for some students in their classrooms. Teachers also stated that they were concerned about classroom management before the intervention and relied on ineffective tools to mitigate disruptive behavior. After the intervention, teachers recognized other methods to work with students about their behavior that was positive, as well as proactive, in building stronger relationships with their students.

The most interesting pattern noted from the intervention was the discord between the teachers’ responses on the Teacher Efficacy Survey and their instructional practices. While the participants scored high on the PTE and mixed results on the GTE survey, their behaviors with students indicated they lacked the confidence in their own skills and
further indicated the tools that they were using with students were ineffective, resulting in their inability to change their beliefs about struggling students and avoid persisting with students when they were challenged by the curriculum.

Another interesting pattern surfaced among the focus group participants. There was a discrepancy between the results of the survey and the teachers’ instructional behavior patterns with struggling low SES minority students. When the teachers utilized the strategies from the BTT framework they reported positive experiences with students and noted behavior and academic changes. Before the intervention, teachers indicated they were able to manage their classrooms, but relied on ineffective tools when working with students. They recognized that those strategies did not result in positive outcomes but resigned to their belief that the outcome was caused by the student and not the result of the teachers’ actions.

The teachers in the intervention indicated the need for more meaningful professional development that focused on the social and emotional learning for students and classroom management. Teachers indicated that the opportunities for further professional growth were constrained by time limitations when attempting to share their new knowledge and apply what they had learned from the professional development training into their teaching practices.

**Implications for Practice and Research**

Although the size of the focus group participants was limited, this study reveals that this could be replicated on a larger scale with teachers in private or public institutions. This type of study that includes teacher efficacy and training in neuroscience education would be beneficial to K-12 teachers and higher education pre-service teachers.
during their educational requirements. In addition, independent schools, in general, might consider examining the achievement of their students from lower SES families and minority families. Where there are achievement disparities, they might also consider implementing a similar type of intervention that allows teachers to better understand their own beliefs and improve their pedagogical practices.

Recommendations for further research would include studying personal and general teaching efficacy with experienced teachers. In addition, collecting and analyzing data can further examine belief changes, teaching practices, and student academic outcomes from observations during longer research studies. Even though based on the candidates’ responses before and after the invention there was little to no movement on the survey, the changes in the behaviors of the teachers indicated further implications for practice and research.

Further research in collective efficacy may shed more light on how a school climate may affect the efficacy of teachers. Collective efficacy is built on the perception of teachers’ beliefs in the essential viewpoint that as a group, teachers can improve student learning. There is within the collective efficacy of teachers the belief that sharing the responsibility from administrators to teachers and staff is a partnership (Hardin, J. 2010; Brinson, & Steiner, L. 2007). Along with the shared responsibility is the relationship that is built between administrators and teachers that have the opportunity to consistently be included in the decisions that affect instruction, curriculum, materials, activities, and disciplinary policies.
Limitations

There are several limitations to this study including the sample size, the interpretation of the survey questions, length of the intervention, other school related initiatives that required use of teachers planning time, and the climate and culture of the school.

1. The size of the focus group included five participants, which may have contributed to the limitations of this study. A larger sample size of teachers in a public education institution might reveal new insights and discoveries about beliefs of teachers that shaped learning and educational practices. Since this study was conducted in an independent school setting, the size of the school in comparison to a public school may have provided different results. I believe this model of professional development and the size provided an opportunity for participants to examine their own self-efficacy and teaching practices through self-reflection and collaboration with their peers. As the researcher and part of this study I emphasized to the participants that the research was conducted in an environment built on trust. The goal of this research would be to support students and the teachers who work with students.

2. A limitation to this study is in the interpretation of survey questions that may have varied based upon different definitions from the participants in this study.

3. School related initiatives that required the use of teachers’ planning time began with the new principle instituting a new social-emotional
curriculum that required participation from all faculty, including myself. During this transition in leadership the commitment changed from supporting my intervention to institutionalizing a social emotional curriculum from the new head of school that was associated with a large research university in the eastern part of the United States. As part of the long-range plan for Smith Academy this required the faculty to devote planning time in professional development to learn the new program and begin the following school year in 2017 introducing this program to students in their classrooms.

4. The resistance from the new principal to support my study created a climate of instability with the faculty when I solicited volunteers for this study. The new principal’s working relationships with faculty and administration was to micromanage all aspects of running the school, including the day-to-day operations, curriculum, committee participation, the school’s seven-year self-study required to be completed within one year, and the new social emotional curriculum.

5. The Professional Development Learning Community on the Brain Targeted Teaching intervention was conducted for six weeks from April to June. This may not have been a sufficient amount of time to measure changes in teacher beliefs. School initiatives that were undertaken in the school during this intervention may have been a contributing factor in the number of participants to volunteer for this study.
6. Some members of faculty wanted to volunteer for this study, however they felt ambivalent in light of the new Head of School instituting his own initiatives. This created a sense of subversion if volunteers participated in my study using their planning time and not using their planning time for school initiatives directed from the new principal. This may account for the small number of participants in this study and the apprehension some faculty members faced if they volunteered for my study. Given that the participation group was small, there existed an undercurrent of secrecy from the teachers not to disclose that they were part of this study. As the researcher, I believed this type of discomfort that the participants felt could have contributed to how they progressed in this study.

7. In spite of the institutional pressure placed on teachers there were many moments during this study in which the participants were reflective about their beliefs regarding low SES minority students and how their beliefs may have affected their working relationships with these students. The majority of the participants were engaged during the study, collaborated with their colleagues, and seemed to indicate a vested interest in growing during this professional development. I found the participants possessed willingness and candor in sharing their thoughts and beliefs in an environment that was aimed to provide the participants a safe place to be direct and sincere.
Conclusions

This research study examined the beliefs and perceptions of five faculty members in the focus group participating in the Professional Development Learning Community on Brain Targeted Teaching framework. This literature builds upon and extends the research conducted by John Bull, Hardiman, and Rinne (2013). The Professional Development Learning Community Study examined teacher beliefs and practices through integrating cultural awareness and multicultural education practices associated with teacher efficacy. While the participants did not demonstrate changes on general teacher efficacy and personal teacher efficacy within the quantitative survey, qualitative evidence does suggest that participation in the Professional Development Learning Community did support teachers in their beliefs about professional development and the strategies used in the Brain Targeted Teaching framework.

Using the framework from Professional Development Learning Community and Action Method Research encouraged teachers to collaborate with one another and find positive examples and strategies to support students and increase their awareness of students’ diverse background and learning needs within their classrooms. This study has helped to shed light on the importance of a Professional Development Learning Community and encourage the use of professional development as a means to support teachers in their quest for developing their teaching and personal self-efficacy as a determinate of student achievement.

As this research study indicated, general efficacy and personal efficacy are two beliefs that were explored in understanding how teachers felt about their abilities to teach low SES minority students. Teacher efficacy is a belief that flows in and out of the four
sources of efficacy and often those beliefs are shaped by a teacher’s ability to master experiences and persevere through challenging situations with students. Participants utilized vicarious experiences through observing role models, colleagues, or mentors absorbed in teaching students that were parallel with their teaching desires and abilities. Cognitive processing of observing successful and unsuccessful performances enhanced a teacher’s individual capacity to analyze and self-correct patterns of behavior. The collaborative process, such as the Professional Development Learning Community, maximized the vicarious experiences of teachers along with verbal persuasion that represented a teacher’s desire to interact with colleagues in a safe environment so they could explore and strengthen their limitations and challenges with teaching students.

Professional development for teachers is essential for meaningful and significant educational improvements that are both essential and systemic. New challenges will continue to emerge for students because of policy changes, high stakes standards in education, and school accountability, however, professional development is one key that continues to be the link between student achievement and teacher effectiveness.

My role as the researcher in this intervention was to explore, through action research, the participants using the BTT model and their efficacy beliefs when working with low SES minority students. The need for professional development and teachers understanding of their own biases through reflection, discussion, and teaching practices affected the students that they taught in their classrooms and the students' academic outcomes. Banks’ (2015) dimensions of multicultural education clearly speaks to imbedding multicultural education within disciplines and recommends that teachers have the background knowledge required to improve their teaching pedagogy. This is
necessary as Banks (2015) suggests in order to obtain successful academic achievement in students, teachers are required to be knowledgeable about cultures, value systems, and characteristics within different cultures, language, and other cultural and ethnic differences.

Research indicates that many students’ academic performance is negatively affected by their socio-economic status, which often times is related to a child’s experiences in their home environment and their family’s societal economic position. Low-SES minority children are often at risk because they have not had the exposure to develop academic skills in a positive learning environment (Burger, 2010). For low SES minority children this may be their first exposure to formal education. As a result, they will be academically behind their much stronger peers, particularly if the school has a rigorous curriculum.

Research in the area of poverty and stress as it relates to children’s learning and cognition is of great concern to many. Research indicates that traumatic experiences that happen early in life to children can have a negative impact on children’s development (Glasscock, Andersen, Labriola, Rasmussen; Hansen, 2013). Kotulak (2007) suggests children exposed to violence or children raised in impoverished surroundings maybe at a higher risk in learning or have difficulty in learning in an educational setting. Understanding how the brain develops during critical learning periods and what children are exposed to requires a deeper understanding for teachers who are working with students from different cultural and socio-economic backgrounds. Hardiman (2012) suggests children from lower SES environments do not have as many learning opportunities available to them as their higher SES peers. The experiences that children
are exposed to, according to research, can affect the structure of a child’s brain and the brain’s function, especially in a learning environment such as a classroom. In doing so, it is even more crucial that teachers create a learning environment that is supportive of all children and their diverse backgrounds that are part of the student’s learning experiences.

The teachers who participated in this study had direct experience with taking their knowledge of brain development and understanding how learning occurred for the students in their classrooms and the importance of teaching students about their brains. Making neural connections for students and their positive experiences in the classroom stimulated that connection in the brain which activates learning. The opposite is also true of children exposed to negative experiences that engage neural activity, which can then lead to children having difficulty disregarding information that is not relevant (Hardiman, 2012). This can also be evident in the classroom when children are learning. Immordino-Yang & Damasio (2007) suggest it is not enough for teachers to know that experiences are part of students learning, but that there are emotional connections from those experiences that can impact a student’s learning in the classroom. In doing so, it is even more key that, with this in mind, teachers create a learning environment that is supportive of all children, including those who backgrounds are diverse, so teachers can work in ways to engage children in their own learning through their experiences.

Classroom teachers that are knowledgeable and experienced in making connections with their students utilize strategies that help students achieve and experience success in learning. According to Carrion & Wong (2012), children who are subjected to negative experiences are at great risk for struggling in the classroom and developing behavior disorders that may prevent them from learning to the best of their
abilities. The students that the participants worked with in their classrooms everyday were low SES minority students. As teachers utilized the BTT model they began to be more open in changing their beliefs about these students. There were small noticeable changes in their beliefs these teachers had about their students that were demonstrated through their practices and their discussions. This supports the idea that professional development that is performed over an extended period of time and incorporates continuous support and collaboration with teachers, increases teacher efficacy and is beneficial for students and teachers. Teachers that are trained through professional development with a focus on personal efficacy and general efficacy will work with students who are struggling by changing their pedagogical practices with proven research strategies that support students in the classroom, especially low SES minority students.
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Appendix A  
Teacher Efficacy Scale  
(Gibson & Dembo, 1984)

Please indicate the degree to which you agree or disagree with each statement by circling the appropriate numeral to the right of each statement.

1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = slightly agree, 5 = agree, 6 = strongly agree

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>When a student does better than usual, many times it is because I exerted a little extra effort.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2.</td>
<td>The hours in my class have little influence on students compared to the influence of their home environment.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3.</td>
<td>The amount that a student can learn is primarily related to family background.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4.</td>
<td>When a student is having difficulty with an assignment, I am usually able to adjust to his/her level.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>5.</td>
<td>If students aren’t disciplined at home, they aren’t likely to accept any discipline.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6.</td>
<td>When I really try, I can get through to most difficult students.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7.</td>
<td>A teacher is very limited in what he/she can achieve because a student’s home environment is a large influence on her/his achievement.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>8.</td>
<td>When the grades of my students improve, it is usually because I found more effective teaching approaches.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>9.</td>
<td>If a student masters a new concept quickly, this might be because I knew the necessary steps in teaching that concept.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>10.</td>
<td>If parents would do more with their children, I could do more.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Statement</td>
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<td></td>
<td></td>
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<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>If a student did not remember information I gave in a previous lesson, I would know how to increase his/her retention in the next lesson.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>12.</td>
<td>If a student in my class becomes disruptive and noisy, I feel assured that I know some techniques to redirect him quickly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>13.</td>
<td>The influences of a student’s home experiences can be overcome by good teaching.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>14.</td>
<td>Even a teacher with good teaching abilities may not reach many students.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
Appendix B

Brain Targeted Teaching Implementation Checklist

<table>
<thead>
<tr>
<th>Brain-Target One: Setting the Emotional Climate for Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive Language</strong></td>
</tr>
<tr>
<td>Strategy</td>
</tr>
<tr>
<td>Teacher praises students for positive behaviors</td>
</tr>
<tr>
<td>Teacher uses behavior-specific praise</td>
</tr>
<tr>
<td>Teacher uses direct communications rather than veiled language</td>
</tr>
<tr>
<td>Notes:</td>
</tr>
</tbody>
</table>

| Predictability                                             |
| Strategy                                                   |
| Classroom routines are evident                             |
| Special events, goals, and/or successions are celebrated    |
Emotions and connectedness in school

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student(s) emotions were gauged and acknowledged</td>
<td></td>
</tr>
<tr>
<td>Positive teacher-student connection is evident</td>
<td></td>
</tr>
<tr>
<td>Consistent classroom expectations are evident</td>
<td></td>
</tr>
<tr>
<td>All students are involved in the lesson</td>
<td></td>
</tr>
<tr>
<td>Instructional activities are content-based, rigorous, engaging. Differentiated, and meaningful</td>
<td></td>
</tr>
<tr>
<td>Opportunities are available for cooperative work with peers</td>
<td></td>
</tr>
<tr>
<td>Positive messages are sent home about students</td>
<td></td>
</tr>
<tr>
<td>Teacher provides a supportive environment for learning</td>
<td></td>
</tr>
</tbody>
</table>
Teacher demonstrates warmth and kindness

Humor is evident in classroom interactions

Notes:

**Student Control and Choice**

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity centers are used in the classroom</td>
<td></td>
</tr>
<tr>
<td>Students are given a choice from selected reading material</td>
<td></td>
</tr>
<tr>
<td>Students can choose the method in which to demonstrate their understanding of content</td>
<td></td>
</tr>
<tr>
<td>Traditional, standardized assessment and methods are supplemented with authentic assessments, engagement in the arts, and/or critical thinking</td>
<td></td>
</tr>
<tr>
<td>Activities related to curriculum objectives</td>
<td></td>
</tr>
<tr>
<td>Notes</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td></td>
</tr>
</tbody>
</table>

**Reflection and Mindfulness**

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher focuses on positive interactions</td>
<td></td>
</tr>
<tr>
<td>Students are given opportunities for quiet reflection</td>
<td></td>
</tr>
</tbody>
</table>

**Brain-Target Two: Creating the Physical Learning Environment**

<table>
<thead>
<tr>
<th>Attention and Novelty</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Observed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room is free of clutter</td>
<td></td>
</tr>
<tr>
<td>Posers and class work reflect current content</td>
<td></td>
</tr>
</tbody>
</table>
Desks are appropriately arranged (e.g., small clusters, large, circle, theater style, etc.) depending on lesson

Window blinds are open to optimize natural light

Lamps are used to increase lighting if necessary

Notes:

| Sound/Scent |
|---|---|
| **Strategy** | **Observed** |
| A relaxing atmosphere is created using background sounds (e.g., classical music, wind chimes, or nature sounds) | |
| Time for quiet reflection is built into the lesson | |
| Classroom smells fresh and inviting: Orange, vanilla, and lavender helps reduce anxiety | |

Notes

| The Effects of Movement |
|---|---|
| **Strategy** | Observed |
| Children are able to move about freely as appropriate | |
| Various workstations (e.g. reading center, math center) are set up throughout the classroom | |
Students can choose the method in which to demonstrate their understanding of content

Yoga, stretching and/or creative movement breaks are taken

Notes

| Brain-Target Three: Designing the Learning Experience-Creating the “Big Picture” |
|------------------|------------------|
| **Strategy** | **Observed** |
| Visual representations such as graphic organizers are used to give students the “big-picture” framework for the unit. | |
| Essential concepts, content, and skills are evident in lesson or unit and communicated to students in accessible ways. | |
| Learning goals are identified and communicated to students in accessible ways | |
| Student activities involve multiple sensory modalities, promoting long-term retention | |
| Learning activities are purposeful and related to learning goals; students are able to identify how activities relate to learning goals | |
| Required evaluations (benchmarks, end-of chapter test, etc.) are identified | |

Notes:
Appendix C

Literacy Lesson 1

<table>
<thead>
<tr>
<th>Lesson Objective:</th>
</tr>
</thead>
<tbody>
<tr>
<td>The unit begins by connecting students’ prior knowledge to today’s lesson. This provides students with context to help introduce the new learning goals. Students learn a song with the spelling of the students’ name to build awareness of sounds and how to manipulate sounds. The songs often feature repetitive tunes to help students remember the songs and the spelling of each student’s name.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Challenges:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Meeting the individual learning needs of kindergarten students.</td>
</tr>
<tr>
<td>• Recognizing their differences.</td>
</tr>
<tr>
<td>• Physically active students require multiple breaks in between lessons.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Target Areas:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The classroom builds community relationships and early reading strategies.</td>
</tr>
<tr>
<td>• Students learn to recognize peer’s names and the peers themselves.</td>
</tr>
<tr>
<td>• Name celebrations link drawings of familiar people and places to words.</td>
</tr>
<tr>
<td>• Students practice drawing representational pictures of their peers and write the student’s name.</td>
</tr>
<tr>
<td>• These foundational print concepts prepare students to later sound out words and phrases on their own.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Brain Target Areas and Lesson Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Using the BTT 1 model to create a safe environment for learning, teachers recognize the connection between emotions and learning and what contributes to optimal student learning.</td>
</tr>
<tr>
<td>• Teachers establish a safe environment by meeting individually with students, getting to know them and establishing a routine of classroom activities.</td>
</tr>
<tr>
<td>• Students begin to take ownership in their learning by introducing stamina and independence.</td>
</tr>
<tr>
<td>• Students learn about their peer’s differences and teachers acknowledge those differences as uniqueness of each student.</td>
</tr>
<tr>
<td>• Shared differences are seen in stories during reading, peer names, and students re-telling of personal experiences.</td>
</tr>
</tbody>
</table>
**Evidence of Success Using the Brain Targeted Teaching Method to Increase Student Learning:**
- Teachers connected more with students individually.
- Increase in student participation.
- Increase student engagement and motivation.
- Demonstrate understanding of the organization and basic features of print. Develop printing concepts.
- Recognizing spoken words that are represented in specific sequences of letters.

<table>
<thead>
<tr>
<th>Table 4.2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science Lesson 2</td>
</tr>
</tbody>
</table>

**Lesson Objective:**
- Use the BTT 3 model to design the learning lesson for students using visual, graphic organizers and graphic maps for the unit of study.
- The BTT 3 emphasizes the use of establishing the “big picture” for students and increase a deeper understanding of the science unit and further encourage students learning connections to other concepts.
- Using BTT 4 methodology promotes mastery of this unit. The teacher has designed this unit keeping in mind the strategies for long term memory and short term memory.
- This lesson uses a variety of strategies such as mnemonics, chunking and interleaving as memory aids.
- Art is included in this lesson to give students an opportunity to use other means of retaining knowledge from this lesson and employ creativity with their own analogies of black boxes.

**Challenges:**
- Meeting the individual learning needs of 4th and 5th grade students.
- Recognizing their different socio-economic backgrounds, blended families, same-sex parents and divorced parents.
- Five students struggling academically who are below grade level achievement.
- Two students who are bi-lingual.

**Target Areas:**
- In fourth and fifth grade, students expand their scientific understanding of systems to explore how parts within a system connect and work together.
- Students study the hierarchy of systems to find connections between these systems and subsystems.
- Students learn how the parts within a system work together to make a whole using a black box model.
- Students will collect, present, and interpret data to summarize their results.
- Students collaborate in groups and communicate their ideas to arrive at a consensus.
- These skills prepare students for planning and implementing investigations later in middle school. Building a conceptual model will challenge students to discover what the inside of the black box looks like without looking inside.
- Prepares students to build a physical representation of their black box later in the unit.

### Brain Target Area and Lesson Objectives

- The BTT 3 model is designed to facilitate the lesson for students using visual, graphic organizers and graphic maps for the unit of study.
- BTT 3 emphasizes the use of establishing the “big picture” for students and increase a deeper understanding of the science unit and further encourage students learning connections to other concepts.
- BTT 3 encourages retention and comprehension of learned concepts.
- The BTT 4 methodology promotes mastery of this unit.
- This unit models strategies for long term memory and short term memory.
- This lesson uses a variety of strategies such as mnemonics, chunking and interleaving as memory aides and repetition.
- Art is included in this lesson to give students an opportunity to use other means of retaining knowledge from this lesson and creativity with their own analogies of black boxes.

### Evidence of Success Using the Brain Targeted Teaching Method to Increase Student Learning:

- Using concrete tools and working in pairs helps scaffold student learning.
- Students become more confident and independent in their investigation and exhibit more divergent thinking strategies.
- Use of multi-sensory activities to promote learning.
- Utilizing visual organizers increases comprehension and provides the big picture of what students are learning.
- Writing in science notebooks offers students a chance to think more deeply about their scientific process, which reinforces learning goals and supports students’ voice.
## Appendix D

### Brain Targeted Teaching Planning and Preparation Template

<table>
<thead>
<tr>
<th>INTASX PRINCIPLES FOR TEACHING</th>
<th>FRAMEWORK</th>
<th>BRAIN TARGETED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making content with meaningful.</td>
<td>Demonstrating knowledge of content and pedagogy</td>
<td>BTT Three: Learning designs with concept map and connections.</td>
</tr>
<tr>
<td>Innovative application of content.</td>
<td></td>
<td>BTT Five: Apply knowledge</td>
</tr>
<tr>
<td>Child development and learning theory.</td>
<td>Knowledge of students</td>
<td>BTT One: Establish welcoming emotional climate</td>
</tr>
<tr>
<td>Learner development environment</td>
<td></td>
<td>BTT Two: Create a learning environment supportive physical.</td>
</tr>
<tr>
<td>Learning styles/diversity welcoming learner difference.</td>
<td>Establishing a culture for learning.</td>
<td>BTT One: Establish emotional climate.</td>
</tr>
<tr>
<td></td>
<td>Engaging students in learning.</td>
<td>BTT Two: Create a learning supportive Physical environment.</td>
</tr>
<tr>
<td></td>
<td>Demonstrating flexibility and responses.</td>
<td></td>
</tr>
<tr>
<td>Instructional strategies/ with Problem solving addition to content.</td>
<td>Instruction</td>
<td>BTT Three: Learning design concept map and connections</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BTT Four: Repetition: in work sheets use arts to make come alive.</td>
</tr>
<tr>
<td>Motivation and behavior learning environment, procedures</td>
<td>Managing classroom learning environment, procedures</td>
<td>BTT One: Establish welcoming emotional climate.</td>
</tr>
<tr>
<td></td>
<td>Managing student behavior</td>
<td></td>
</tr>
<tr>
<td>Communication/knowledge arts to students.</td>
<td>Communicating with students to make content come alive.</td>
<td>BTT Four: Repetition: use arts to students.</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>----------------------------------------------------------</td>
<td>-------------------------------------------</td>
</tr>
<tr>
<td>Planning for instruction environment</td>
<td>Planning and preparation</td>
<td>BTT Two: Create a learning environment.</td>
</tr>
<tr>
<td>Setting instructional outcomes.</td>
<td></td>
<td>BTT Three: Setting instructional outcomes.</td>
</tr>
<tr>
<td>Demonstrating knowledge of resources.</td>
<td></td>
<td>BTT Three: Demonstrating knowledge of resources.</td>
</tr>
<tr>
<td>The classroom environment.</td>
<td></td>
<td>BTT Three: The classroom environment.</td>
</tr>
<tr>
<td>Organizing physical space</td>
<td></td>
<td>BTT Three: Organizing physical space.</td>
</tr>
<tr>
<td>Assessment in real-world settings</td>
<td>Designing student assessments.</td>
<td>BTT Five: Assessing students in real-world settings.</td>
</tr>
<tr>
<td>Reflection and professional growth</td>
<td>Professional responsibilities reflecting on teaching</td>
<td>BTT One-Six teaching professional responsibilities.</td>
</tr>
<tr>
<td>Interpersonal relationships, collaboration.</td>
<td>Participating in a professional community</td>
<td>BTT Three and Four: Participating in an interdisciplinary professional community.</td>
</tr>
<tr>
<td>Growing and developing professionally</td>
<td></td>
<td>BTT Three and Four: Growing and developing professionally.</td>
</tr>
<tr>
<td>Showing professionalism</td>
<td></td>
<td>BTT Three and Four: Showing professionalism.</td>
</tr>
<tr>
<td>Interpersonal relationships emotional.</td>
<td>Creating an environment of respect and rapport</td>
<td>BTT One: Establishing interpersonal relationships.</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Communicating with families</td>
<td>BTT One: Communicating with families.</td>
</tr>
</tbody>
</table>
Appendix E

Data Collection

The data collection for this study will be collected from (a) surveys, (b) teacher lesson plans, (c) field notes from the Professional Development Learning Community, bi-weekly meetings, (d) classroom observations of lesson plans, (e) teacher reflection journals and discussions (g) and exit survey interviews.

Appendix F

Exit Interview Questions

1. Describe the changes you saw in your students after delivering the Brain Targeted Teaching lesson plans.

2. Describe the most salient aspects of teaching the Brain Targeted Teaching method.

3. What are the highlights you feel are most important from the Brain Targeted Teaching method that you will continue to use?

4. Describe how this intervention has helped your students overall.

5. Describe how this intervention has changed your teaching instruction.

6. Describe how this intervention could be improved.
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ACADEMIC BACKGROUND
EdD
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Mind, Brain, and Learning

MA
Loyola Marymount University
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B.A.
University of Colorado
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Psychology

PROFESSIONAL EXPERIENCE
The Bush School
1998-2016
Assistant Lower School Director & School Counselor
Seattle, WA

The Bush School
2002-2016
Department Head, Support Services
Seattle, WA

Kimberle Jackson-Butler, MA
Bellevue, WA
1986-1988
Private Therapist & Family Counseling

RAB Architecture
1991-2004
Manager of Office Operations RAB Architecture
Los Angeles

University of Southern California
1986-1988
Administrative Assistant, Testing Bureau
Los Angeles, CA

University of Southern California
1984-1986  Program Administrative Assistant
Los Angeles, CA

PROFESSIONAL DEVELOPMENT

2006  Leadership Tomorrow
Seattle, WA

2007  Leadership Tomorrow Learning Lab Coach
Seattle, WA

2002-2014  People of Color Conference
Seattle, WA

2003  Learning and the Brain Conference
Boston, MA

2008  Certificate in Mind, Brain, and Learning
Boston, MA
Harvard University

CIVIC INVOLVEMENT

2012-present  Board of Directors
Seattle, WA
Washington Housing Equity Alliance

2008-2011  Vice President of the Board of Directors
Seattle, WA
Family Law CASA

2009-2010  Board of Directors
Seattle, WA
Family Law CASA

2008-2011  Board of Directors
Bellevue, WA
Life Wire (Eastside Domestic Violence)

2009-2011  Board of Directors
Bellevue, WA
Dollars for Scholars (Scholarship America)

2007  Wellness & Healing Services Design Group
Bellevue, WA
Catholic Community Services, Monica’s Village
Center for Community Healing and Change